GOVERNANCE IN EUROPEAN FOOD VALUE CHAINS

PROJECT REPORT D5.1

VALUMICS - UNDERSTANDING FOOD VALUE CHAINS AND NETWORK DYNAMICS

JUNE 2019

VALUMICS

Food Systems Dynamics

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ABOUT

VALUMICS stands for value chain dynamics and is a research project funded by the EU H2020 programme. VALUMICS will enable decision makers to evaluate policy impact on food value chains

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VALUMICS

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Governance in European Food Value Chains

VALUMICS

Food Systems Dynamics

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ABBREVIATIONS AND ACRONYMS

ACOPAEX	Agrupación de Cooperativas Agrarias de Extremadura - Agrarian Cooperatives Group of Extremadura
AEM	Agri-environment measures
AFZ	Allgemeine Fleischer Zeitung (general meat newspaper)
AGPB	Association Générale des producteurs de Blé (Association of wheat producers)
AHDB	Agriculture and Horticulture Development Board
AMITOM	Mediterranean International Association of the Processing Tomato
ANICAV	Associazione Nazionale Industriali Conserve Alimentari Vegetali - National Association of Industrial Vegetable Food Preserves
ANMF	Association Nationale des Meuniers de France (French National Association of Millers)
APO	Association of producer organisations
ASC	Aquaculture Stewardship Council
BAP	Best Aquaculture Practices
BLE	Bundesanstalt für Landwirtschaft und Ernährung (The Federal Office of Agriculture and Food)
BMEL	Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry of Food and Agriculture)
BMPA	British Meat Processors Association
BSE	Bovine Spongiform Encephalopathy
BZfE	Bundeszentrum für Ernährung (Federal Centre for Nutrition)
CAP	Common Agricultural Policy
CJD	Creutzfeldt-Jacob Disease
CNIEL	Centre National Interprofessionnel de l'Economie Laitière - National dairy interbranch organization
CMO	Common Market Organization
Conv	Conventional farmers
Coop	Cooperatives
CPO	Commercial producer organization
CRC	Culture Raisonnée Contrôlée (Controlled reasoned farming)
CRIEL	Centre Régional Interprofessionnel de l'Economie Laitière - Regional dairy interbranch organization
CSR	Corporate Social Responsibility
DBV	Deutscher Bauernverband (The German Farmers' Association)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DESTATIS	Das Statistische Bundesamt (Federal Statistical Office of Germany)
DG AGRI	Directorate-General for Agriculture and Rural Development
DGCCRF	Direction Générale de la concurrence et de la consommation de la République française - French General Directorate for Competition Policy, Consumer Affairs and Fraud Control

DTAS	Dairy Transport Assurance Scheme
EBLEX	Former name of the Agriculture and Horticulture Development Board
EC	European Commission
EEA	European Economic Area
EEC	European Economic Community
EFSA	European Food Safety Authority
EGA	États Généraux de l'Alimentation - Estates general on Food
EIA	Environmental impact assessment
EIG	Economic Interest Grouping
EMFF	European Maritime and Fisheries Fund
EPS	Expanded polystyrene
EU	European Union
EUMOFA	European Market Observatory for Fisheries and Aquaculture Products
FAO	Food and Agriculture Organisation of the United Nations
FDSEA	Fédération Départementale des Syndicats d'Exploitants Agricoles - Departmental federation of farmers union
FEB	Fédération des entreprises de Boulangerie (National Federation of Bakery Industries)
FLBC	Fermes Laitières Bas Carbone - Low carbon emissions dairy farms
FNIL	Fédération Nationale des Industries Laitières - National federation of private dairy industries
FSA	Food Standards Agency (UK)
FVC	Food Value Chain(s)
GAP	Good Agricultural Practices
GfK	Gesellschaft für Konsumforschung (Society for Consumer Research)
GFSI	Global Food Safety Initiative
GSI	Global Salmon Initiative
GVC	Global Value Chain(s)
HACCP	Hazard Analysis Critical Control Points
HOG	Head on gutted
HoReCa	Hotel Restaurants & Catering
HQB	Quality Beef Quota
IBO	Organizzazione Interprofessionale per la lavorazione del pomodoro del Nord Italia - The Interbranch Organization Processing Tomatoes of Northern Italy
IDF	Île de France
IFFO	The Marine Ingredients Organization
IMTA	International Meat Trade Association
IRTAC	Institut de Recherches Technologiques Agroalimentaires des Céréales (Institute of agri-food technological research on cereals)
LCA	Life Cycle Assessment

LEL	Landesanstalt für Entwicklung der Landwirtschaft und der Ländlichen Räume (State Office for Development of Agriculture and Rural Areas)
LfL	Bayerische Landesanstalt für Landwirtschaft (Bavarian State Research Center for Agriculture)
MAB	Maximum Allowable Biomass
MAPA	Ministerio de Agricultura, Pesca y Alimentación - Ministry of Agriculture, Fisheries and Food
MEG	Milcherzeugergemeinschaft (Milk producer associations)
MFCA	Ministry of Fisheries and Coastal Affairs
MLCS	Meat and Livestock Commercial Services
MSFD	Marine Strategy Framework Directive
NCPO	Non-commercial producer organization
NFU	National Farmers Union (UK)
OFPM	Observatoire de la Formation des Prix et des Marges (Observatory of prices and margins formation)
Org	Organic farmers
PDO	Protected Denomination of Origin
PO(s)	Producer Organizations
POFO	Fisheries and Oceans - Senate of Canada
R&D	Research and development
RASFF	Rapid Alert System for Food and Feed
RPA	Rural Payments Agency (UK)
RSPCA	Royal Society for the Prevention of Cruelty to Animals
RUMA	Responsible Use of Medicines in Agriculture Alliance
SFT	Sustainable Food Trust
SKU	Stock Keeping Units
SME	Small and medium enterprises
SPS	Single Payment Scheme
TSE	Transmissible Spongiform Encephalopathies
UHT	Ultra High Temperature (milk sterilization process)
USA	United States of America
UTP	Unfair trading practices
VAP	Value added products
VCOP	Voluntary Code of Best Practice on Contractual Relationships
VIA	Visual Imaging Analysis
WFD	Water Framework Directive

EXECUTIVE SUMMARY

1. This report presents findings from eight national studies into the governance of five European food value chains: liquid cow's milk, beef steak, farmed salmon, processed tomato, and bread from wheat. Each study evaluates the governance of the value chain through the different stages of production, processing and retail, following the transformation from farmed/grown commodity to final food product. The studies are situated within broad regulatory frameworks of state-led policies at the European and national level, while also encompassing governance initiatives originating from corporate and societal actors. A Global Value Chains governance approach was used to create an initial characterization of value chain structures and inter-firm relationships. This provided a starting point for further analysis of individual value chain dynamics and relationship interactions. Attention is paid, where relevant, to issues such as value chain structure and product flow, industry structure and concentration, contractual arrangements, price negotiations, trade, consumption patterns and different EU and state led regulatory interventions. The research draws on existing literatures and documentary sources, further exploring stakeholder perspectives through a series of 50 qualitative in-depth interviews across the five value chains. Interviews allowed for a deeper exploration of the different perceptions of relationships dynamics felt by actors across each value chain.

2. The introductory chapter elaborates on the aims of the research task, and on both the conceptual approaches to governance used and the research methods deployed. The chapter also explains in more detail some of the key findings from across the different food value chains studied and reflects on the implications of these findings. There are a total of eight nationally located studies with the findings from each one presented subsequently as a separate chapter in the report: Dairy cows to liquid milk in France, Britain and Germany; Beef cattle to steak in Britain and Germany; Farmed Salmon from Norway; Tomato to processed tomatoes in Northern Italy; and, Wheat into Bread in France.

3. The findings from the studies confirm that the nature of governance in value chains covers inter-firm relations but also includes private governance initiatives and public policy and regulatory interventions. The nature of each food value chain has its own particular features and characteristics more specific to that sector. There are important structural features in each value chain that set boundaries within which the dynamics of governance take place. The actors at key stages of each value chain may be in a better structural position than others, which can give them an advantage in the negotiations and bargaining over contracts. Stakeholders' views on fairness are focused on price setting and the means by which pricing decisions are made. It was notable that the interviewees very rarely mentioned the types of unfair trading practices, as defined and laid out in the Directive on unfair trading practices in the agricultural and food supply chain. Rather, it was the subjective experience of price setting (and related volume agreements, for example) in their particular value chain and sector where concerns around fairness and transparency were most explicitly articulated. There is subjectivity in the views of stakeholders over issues such as price

negotiations that must be considered when assessing fairness in value chains. The need for industry, and more particularly for policy makers, is to find the most appropriate mechanisms and interventions (such as interbranch organizations, producer organizations, cooperatives, voluntary codes of practice, mandatory legislation) that will achieve fairer trading and working conditions, and greater transparency and information flow in food value chains. These interventions and mechanisms need to be suitable for each respective agricultural and horticultural sector as well for the agri-food industry as a whole. At both the sector level, and across all food value chains, the important structural features and their impacts on intra-chain bargaining must be taken into account.

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1. GOVERNANCE IN EUROPEAN FOOD VALUE CHAINS

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1.1 INTRODUCTION

The report evaluates the governance of the selected food value chains. The value chains are from the farmed/grown commodity to the final food product. The value chains selected are dairy cows to liquid milk, beef cattle to beef steak, farmed salmon to salmon fillet and other forms, wheat to bread, and tomato to processed tomatoes. In each case the exploration of the value chains' governance is nationally situated within Europe.

There are a total of eight nationally located studies:

- Dairy cows to liquid milk in France, Britain and Germany;
- Beef cattle to steak in Britain and Germany;
- Farmed Salmon from Norway
- Wheat into bread in France
- Tomato to processed tomatoes in Northern Italy.

Each of these studies is within the European Union and associated countries in the European Economic Area.

1.2 GOVERNANCE CONCEPTUALIZED: PUBLIC POLICIES, FIRMS AND FOOD VALUE CHAINS

The European Union derives its policies from the treaties and the competences laid out therein. To achieve the aims of the treaties the European Commission deploys different types of policy action. There are broader strategic policies or programmes that set overall objectives. Within these policy programmes there are more specific laws in the forms of regulations, directives and agreements. Then, there are also non-legislative policy instruments: this is the area of so-called 'soft law' that allows the Commission to seek to have policy influence beyond the direct scope of its competencies. This area of public policy activity embraces modes of governance such as voluntary agreements with key stakeholders and pilot activities designed to influence stakeholders in a policy area to change their actions as a result of shared learning based upon the dissemination of evidence and 'good practice' generated. The use of these governance modes is widespread at national state levels also. The national state and its institutions have extended their policy reach by incorporating important stakeholders from the private sector of business and industry, as well as the voluntary sector and other civil society organisations, under such governance modes,

in order to achieve its public policy goals. This outsourcing of policy delivery is a feature of contemporary food policy (Lang et al. 2009). As a result, governance is based on an iterative process of negotiation and compromise entailing power relationships between actors, and across governments and public agencies, the private sector and civil society (Smith et al 2005; Lang et al 2009) impacting upon the economy and shaping the dynamics of food value chains (Ponte & Sturgeon 2014).

At the level of the firm, academic work on the governance of food value chains focuses upon inter-firm relationships and the information asymmetries and power relations between the firms (including unfair trading practices) and how this impacts upon the distribution of value along the chain. In addition, food chain actors (notably retailers, manufacturers, and food service) conduct private modes of governance impacting upon their suppliers through contract requirements including meeting external certification scheme standards ranging from food safety, to animal welfare to natural resource conservation (Fuchs et al 2011). These certification schemes can derive from parts of the value chain (e.g. British Retail Consortium food hygiene standards) or from civil society based organisations (e.g. animal welfare) or a combination of industry and civil society (e.g. Marine Stewardship Council). Private modes of governance mean that lead firms can set the parameters and standards for other value chain participants (Gereffi et al 2005), based on information and power asymmetries which can, in turn, lead to unfair trading practices and elements of market failure (Cox et al 2002). Failure to provide profitability throughout the value chain (selling produce below cost of production), has led to the exit of farmers from food production impacting upon the diversity and resilience of the European food supply. Hence, value chain governance has social and political dimensions as well as economic.

Agricultural economists have paid increasing attention to the modes of governance in agri-food supply chains in recent years (Bonnano et al 2018; Menard 2018). One articulation of this approach focuses upon transaction cost economics and relational contracts theory, to identify what it terms as hybrid governance forms (Menard 2018). For Menard (2018: 143), this economic based governance is "*the set of devices implemented within organizations, or among networks of organizations, to allocate and monitor assets and rights, providing the backbone to economic activities*". These hybrid governance forms or modes exist between the poles of pure market governance and governance within hierarchies. The hybrid governance modes would include contracts between retailers and suppliers where the buyers may set standards while the supplier gets a certain market access for their product. In these hybrid forms, sit organizations that are separate from individual firms or large vertically integrated corporations. Agri-food economists are more focused upon the economic co-ordination of supply chains, seeing such supply chains as being part of the hybrid institutions that "*refers to complex organizational forms which many stakeholders performing jointly tasks that neither the market nor the individual firm can achieve*" (Carbone 2017).

To date, economists are paying less attention to examining the role of the state and its political motivations for promoting and coordinating the workings of supply chains, and in the public sector's involvement in public-private sector forms of hybrid governance. The public-private governance hybridity involves, for example, the state underwriting private food assurance schemes and involves promoting more collaborative cross industry sustainability practices in food production and manufacturing (Lang et al 2009; Barling et al 2018). This latter area of work on the role of private governance and its

relationship to public regulation and governance modes has attracted more scholarly attention from socio-legal, sociology and political and policy science academics.

In practice, the European Commission has sought to advance the relative bargaining strength of producers in the food value chain in ways that enhance their relative bargaining power in food value chains, through the promotion of cooperatives, producer organizations and inter-branch organizations. The Commission's intervention to aid producers in agri-food markets has led to the introduction of the EU Directive on unfair trading practices in business-to-business relationships in the agricultural and food supply chain. The development of this legislative intervention and the forms it took are explained in the previous VALUMICS project deliverable from work package 3 (Barling et al 2018).

A further conceptual approach to understanding the governance in value chains and their dynamics, more generically, is located in the Global Value Chains (GVCs) literature, that ranges across a large number of industrial sectors. GVC studies of on food and drink value chains have focused mostly on developing country commodity production where the raw commodities gain added value in developed country markets, for example: coffee, cocoa (to chocolate), fresh vegetables, and bananas. The focus of the GVC governance model in on inter-firm relationships and that there are different types of inter-firm relationship that characterize food value chains.

The generic GVC governance model posits that "the structure of global value chains depends critically upon three variables: the complexity of transactions, the ability to codify transactions, and the capabilities in the supply-base" (Gereffi et al 2005: 98). The complexity of transactions between firms is based on the degree of technical specificity and/or investment costs required to supply an individual product e.g. non-standard inputs or processes, time-sensitive delivery, bespoke product differentiation. In some value chains, complexity can be managed through codified instructions, such as technical standards and specifications, which allow for efficient of transmission of instructions between buyers and suppliers. This is dependent on the type of product, the capability of suppliers and on the nature of inter-firm relations that result from the three variables.

Governance type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	↕
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

There are eight possible combinations of the three variables. Five of them generate global value chain types. The combination of low complexity of transactions and low ability to codify is unlikely to occur. This excludes two combinations. Further, if the complexity of the transaction is low and the ability to codify is high, then low supplier capability would lead to exclusion from the value chain. While this is an important outcome, it does not generate a governance type *per se*.

Figure 1-1 Key determinants of global value chain governance. Source: Gereffi et al, 2005

As illustrated in figure 1, the focus of the GVC governance model is on conceptualizing five distinct governance types which have different associated levels of complexity, codifiability and supplier capabilities. Furthermore, as figure 2 shows, each governance type indicates a different organization structure and associated levels of coordination and power-asymmetry between firms. In Market based value chains for example, specifications are not complex, and/or can be easily codified so transactions between firms require little coordination or investment to meet customer requirements. This is categorized as arms-length relations with standardized products that can come from variety of suppliers. In contrast, in hierarchical value chains, high levels product complexity which are not possible to codify result firms will become vertically integrated, effectively keeping or taking production 'in house' to manage transaction processes and costs. Between these two extremes, the GVC model further differentiates three other governance structures: modular, relational and captive.

In Modular value chains, 'turn-key suppliers' produce a customized product to buyer specifications set by lead firms. Buyer specifications can be codified which allows for more complex transactions to be produced efficiently. Although supplier capabilities must be high, codifiability means both suppliers and buyers can work with multiple firms, reducing the need for explicit coordination between suppliers by buyers. Suppliers can be removed from the value chain if the lead firm no longer requires their services but the costs of switching to new customers is also easier for suppliers, resulting in relatively low degrees of power asymmetries between firms.

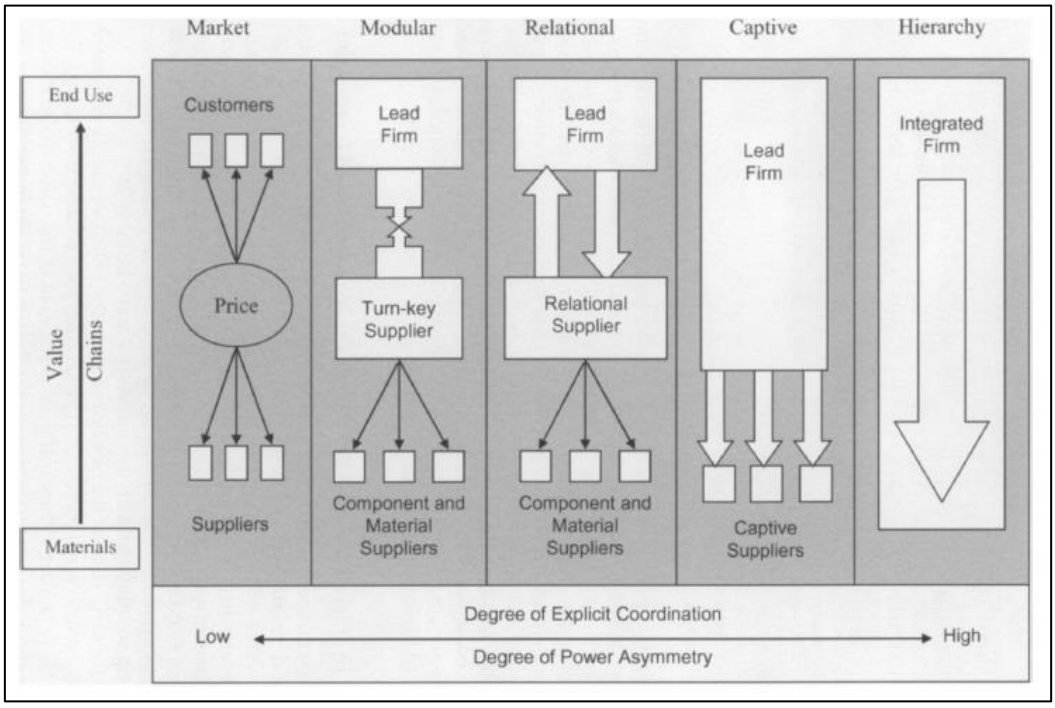

Figure 1-2 : Five global value chain governance types. Source: Gereffi et al, 2005

Relational value chains, like modular value chains, are characterized by complex transaction between suppliers and buyers, and high level of customized product specifications. However, in the relational model, specifications are harder to codify, meaning relationships between firms must be highly coordinated with lots of interaction between firms. In the GVC model, this is shown as leading to a fairly equal power

balance and mutual dependence as both firms rely on each other's complementary competencies in their transactions. In relational chains, trust and reputation, even family and ethnic ties, can play important roles in managing the relationships between firms.

Finally, in Captive value chains, there are high levels of codified complex transactions, but lower levels of supplier capabilities. In these value chains, the authors note, are "*frequently characterized by a high degree of monitoring and control by lead firms*" (Ibid: 84). In this model, the flow of information and power is less balanced, with suppliers transactionally dependent on, or 'locked in', to buyers who intervene directly in production processes. Consequently, suppliers have difficulties in finding alternative customers and/or face significant costs in changing whom they supply.

The authors of the GVC model acknowledge that "*local and national structures and institutions also matter" and that "national-level rules and institutions (e.g., in finance, corporate governance, and education and training) profoundly affect the character of industries*" (Gereffi et al 2005, 98-99). Indeed, a critique of this GVC governance framework picks up on these previous admissions, identifying the absence of an overall governance perspective for the value chains, as it focuses "*at the level of individual transactions, value chain nodes and bilateral relationships, not at the level of overall chain governance*" (Ponte & Sturgeon 2014: 216). At the same time, it is "*evident that powerful factors and actors external to the chain can shape governance through the impact of regulation, lobbying, civil-society campaigns and third-party standard making*" (Ponte & Sturgeon 2014: 217). Gereffi and Lee (2016) follow this up with an identification of different types of governance that impact upon industries – private, social and public. More recent work has begun to identify the role of the state and the ways that it impacts upon GVCs (Horner & Alford 2019). Put another way, in order to provide a fuller understanding of value chain dynamics and governance, there is a need to incorporate the private governance (corporate and societal based) and inter firm relationships work, with the public policy, regulation and governance dimensions, and the resultant public-private governance interactions and organizations.

Furthermore, the dynamics of value chains have a degree of specificity according to the nature of their production, and their transformation into final products for the main markets of sale, and how these processes are regulated: "*Key struggles and contestations take place constantly along value chains and governance is indeed shaped by the specificities of place and path dependency*" (Ponte & Sturgeon 2014: 217). With the focus of the food value chain case studies in this report being on European based food value chains in the single European market, starting from a particular EU member state, or EEA member state, these specificities are of particular significance.

The GVC governance framework provides a useful organizing frame and starting point for our analysis of the governance of different food value chains across the European single market and beyond. It offers a way into identifying relationships along the value chains, where tensions emerge and where decisions are made. However, the cross-continental origins of the model need to be translated into the specificities and pathway dependencies of our particular European national settings and product value chains. The involvement of stakeholders, via in depth interviews allows this analysis to gain a deeper understanding of the dynamics within the value chains and of the perceptions of these dynamics from those involved. Importantly, these findings are related to the

EU regulatory and policy frameworks, and the national legal, industry, supply chain and market settings, within which these actors and value chains operate. The governance model that arises is varied and place and product chain dependent – but with some identifiable similarities and well as differences, as is elaborated further in section 1.4. Each of the food value chains studied in this report applied the GVC governance framework as part of their analysis. In practice, the applicability of the five governance types as hypothesized by Gereffi and his colleagues did not fit as one type for each chain. Rather, the chains exhibited features from more than one of the governance types at differing stages of the value chain. This variability is further explained in the chapters covering each of the value chains. A more detailed explanation of the research methods that were used to apply these conceptual governance approaches is presented next.

1.3 RESEARCH METHODS

The research objectives of the deliverable were to explore the governance of each selected value chain. The national focus of each chapter allowed for an in-depth exploration of the specificities of each chain and to establish particular concerns within, while situating the findings within the wider European regulatory context. In order to achieve these objectives, the researchers drew on existing academic literature and documentary sources available in the public record[1], and generated new data through qualitative interviewing with key stakeholders in each of the value chains. These research methods are suited to the nature and scope of the research of the deliverable. As Ritchie suggests qualitative interviews are *"particularly well suited to research that requires an understanding of deeply rooted or delicate phenomena or responses to complex systems, processes or experiences because of the depth of focus and the opportunity they offer for clarification and detailed understanding"* (Ritchie, 2003: 36-37). In the context of this research, they allowed for the development of a deeper understanding of actor perceptions, and to establish views on the effectiveness of certain policy and governance measures, while also exploring the wider relationship dynamics.

Interviewees were selected using researchers existing contacts, by desk research (e.g. using company and industry websites) and through snowball sampling. The criteria for selection were policy-literate[2] professionals from across the different sectors of the value chains, as well stakeholders from the public sector, industry bodies and civil society whose work corresponded with the research topics. In this sense, the selection was of expert or élite interviewees (Bogner et al, 2009), who had special access to and/or expertise about a value chain, with some involvement in decision-making processes. Interviews were carried out in person, over the phone or via skype. A series of core questions (see box 1) were developed, for use across each case study. These were derived from the research objectives, from previous research in VALUMICS work package 3, and from a survey of the existing literatures and available data. Interviews

[1] For example, the chapters on UK dairy and beef use publicly available documents, including transcripts of stakeholder oral evidence, from UK parliamentary inquiries into farmgate prices (2015-2016) and beef grading and specifications (2016).

[2] 'Policy-literate' is understood as meaning stakeholders who have some involvement in or awareness of policy developments, as they pertain to their work and to the wider value chain.

were semi-structured around these questions but were also tailored to the interviewee's area of work. This allowed for conversational dynamics to guide the interviews, based on the interviewee's expertise and experiences and their particular responses to questions.

Fifty stakeholders were consulted across the five value chain case studies. Time and resource constraints meant that interviews were not possible for the German beef and dairy value chains, but the analysis of these two chapters provided highly relevant results and proved useful for comparing dynamics in the wider European context. A sample of perspectives from different sectors within each value chain was achieved in the interviews, enabling the researchers to draw comparisons. The data from interviews is interwoven throughout chapters, analyzed in conjunction with documentary and secondary data sources. Most interviews took place in late 2018 to early 2019, meaning that they reflect what stakeholders felt were the most important contemporary concerns. The use of qualitative interviewing means the research in this deliverable is both wide-ranging and context-specific, with stakeholder perspectives allowing for some deeper analysis of the different perceptions of power relations and fairness in each value chain.

Core Interview Questions

1. From your perspective, what are the areas where the working of the value chain is unfair?
2. Is value distributed fairly to all actors in the chain?
3. Which actors in the value chain hold the most power and why, in your opinion?
4. How is power exercised in the value chain? and how do actors respond to this?
5. What role do government (agencies) and industry/oversight groups play in these power dynamics?
6. Do you feel decisions made across the chain are sufficiently transparent? (e.g. what access do actors have to information that helps them make decisions)
7. Do governance measures/policies support fairness and transparency across the value chain? – Could these be improved?
8. How would you characterize the levels of trust and collaboration between actors? – Could these be improved?

Box 1: *Core interview questions.* ***Source****: The authors, 2019*

1.4 GOVERNANCE OF FOOD VALUE CHAINS: SOME KEY FINDINGS

This section provides a summary of the key governance features of the five food value chains presented in the main section of the report.

1.4.1 DAIRY COW TO LIQUID MILK: UK, GERMANY AND FRANCE (CHAPTERS 2, 3 & 4)

The dairy cow to liquid milk value chains, exhibit some similar contextual and governance characteristics in the three countries studied: the UK, Germany and France. In Germany and the UK there is an on-going decline in the number dairy farms as producers exit the sector, while dairy herd sizes are getting larger with an increase in the efficiency of milk production per head. France shows similar trends although they are less marked. There is greater concentration of firms along the rest of the liquid milk chain at the processing and retailing stages in all of these studies. Recent decades had seen a retreat of member state intervention in the market for liquid milk, as for example with the abolishment of the milk price setting body in the UK in the 1990s. More recently, over the past decade or so there has been a period of increased volatility in the farm gate price paid to producers caused by a number of factors but exacerbated by the ending of the EU milk production quotas in 2015.

To help the milk producers' transition through the ending of milk quotas, the EU introduced a "milk package" of reforms. The two main ones were that dairy farmers could form Producer Organisations (POs), and member states were given the authority to introduce mandatory contracts between farmers and processors. Producer Organisations for milk have been established in each of these member states but to varying degrees, with just two in the UK, to date. Legal change to the framework for setting contracts has been introduced in France. The UK has experimented with a voluntary code of best practice on contractual relationships (VCOP) between producers and processors to make contract terms more transparent, but this has not proven to be significant to date. Should there be a global price slump then processors could free themselves of their voluntary commitments. The UK Government have stated that they intend introduce legislation for mandatory contracts, but this has not been forthcoming and may change. The French government has granted mandatory authority to dairy POs to negotiate the framework for contracts between their members and the processing dairies. In practice this is usually with a single processing dairy. Also, the POs are beginning to negotiate over volume management as well as price in France and Germany. In addition, in France POs can combine as Associations of Producer Organisations offering the potential for greater collective capacity in terms of information exchange and resource. However, many French milk producers still do not belong to a PO since the establishment of dairy POs is still relatively new. These more recent state interventions are attempting to redress the balance between producers and larger corporations that they sell to. The milk package seeks to provide mechanisms for counterbalancing strength to be given to producers through collective collaborations such as POs and also inter-branch organisations.

In terms of the inter-firm relationships along the value chains, the UK and Germany identify two variations of the GVC model. One mode fits the captive model that identifies the processors and the dairy cooperatives as the lead firms, with the raw milk producers as captive suppliers. The other mode fits more closely the modular or relationship value chain model where retailers are 'lead firms' and dairy cooperatives

and private dairy processors are 'turn-key' suppliers. The French study also depicts a bipolar structure where in one dimension the processors are the lead firm and another where retailers are the lead firms. The retailer led is depicted as having more transparency and exchange of information exchange between the processors and retailers, but not to the producers. The processor led value chain has less information transparency and exchange with the producers.

In all of these countries the main concerns amongst stakeholders arise over the setting of prices between the producers as sellers and the processor and or retailer as the main buyer, and the volumes of milk supply that are agreed upon. In the case of the producer supply to the dairy/processor the contracts employ a dual pricing mechanism in the UK and France. This mechanism gives a higher price (Price A) for the contract stipulated volume of supply from the producer(s) to the dairy/processor and a secondary lower price for any extra volume received (Price B). In the UK these are called nonaligned contracts. Conversely, the UK retailer led chain offers a guaranteed price to the producer but includes a wider variety of standards requirements and on farm advice, managed through retailer led producer development groups. In these aligned or integrated supply chains retailers contract one of more of major dairies to pasteurise and process their own-brand milk. The aligned contracts to a retailer account for a little less than 20% of the UK's milk producers.

The non-aligned contracts are perceived as unfair by UK producer organisations in a number of ways. One concern is the exclusivity they grant to the processors, meaning that producers can't sell any extra production to other processing dairies. A further complaint is that the processor includes clauses in the contracts that allow them to effectively override the other contractual commitments. A challenge found in the French study, is that information asymmetries still exist around assessing the quality of the milk putting the processors in a stronger negotiating position. On the other hand, where local supply is decreasing dairies may be in a weaker bargaining position. In Germany, where there are fewer milk producers in a particular region the contract with a dairy is normally for a period up to five years. On the other side, in the competitive regions, contracts would usually be only for one year. To mitigate risk, some of the milk producer associations have contracts with several dairies at the same time.

Retailer aligned contracts in the UK tend not to guarantee to buy all the milk a producer makes, instead they buy what they use or have forecasted to use, with the rest sold through the processor at the market value. These retail-aligned contracts are perceived by much of the industry as enhancing stability of price and security of income for producers, with much less risk of sudden price drops or changes in contractual terms. They are also viewed as fostering fairer and more transparent working relationships, with development groups meeting regularly to discuss market trends and production issues so that the producers, processor(s) and the retailer can deal with problems collectively. Although producers in aligned contracts agree that they have received better prices for their milk, they acknowledge that they have lost a degree of control over their production decisions.

Furthermore, in all of the national studies, the concentration in grocery retailing means that the majority of liquid milk is sold to consumers through the large retailers. The retailers often keep the prices of liquid milk artificially low as it is a key basket item for their customers, and so it is sold as a loss-leading product. This puts further pressure on the milk prices from the processing dairies, impacting upon the producers, in turn.

So, in the UK there is the dynamic of retailers devaluing prices throughout the wider chain in the long-term, while shielding their aligned producers in the short-term. At the same time, the processors have to seek an operating margin in these circumstances and in relation to global market pressures and price volatilities.

There has been a small degree of product segmentation and differentiation such as organic produced milk, or pasture fed livestock. The main differentiation is that of organic milk, with a growing share of the of the liquid milk market in France which is now around 7.5% in 2017 (up from 2.8% in 2008). In the UK the share is lower at 5.1%. This remains a small part of the liquid milk market for what is, of course, a homogenised commodity. There is no evidence of differences in relationships in the organic sector as opposed to the conventional liquid milk value chains.

The UK study shows that when processors are contracted suppliers in retail-aligned contracts, they have a different level of power in relation to the producers and retailers. However, across all of the national studies processors have been shown to use their enhanced power as the end-buyer in ways that have led to accusations of unfair trading practices from producers. It is possible therefore to conclude that the nature of contractual arrangements and pricing practices are an opportunistic mix of more cooperative partnerships and transactional market-governed exchanges**.** This variability reflects the changing market conditions actors find themselves in, their role in the value chain and the strategic brand and/or the ethical concerns of individual retailers and processors.

1.4.2 BEEF CATTLE TO BEEF STEAK: UK AND GERMANY (CHAPTERS 5 & 6)

The GVC governance framework when applied to the UK and the German beef to steak supply chains appears in each case to fit two of the possible models. The relevant model is determined by the differing nature of the relationships between the actors at the different stages in the value chain. The captive model reflects the relations between the producers (farmers) and the primary processors. The relational/modular value chain model also applies to the relationship between processors and retailers but the producers as well as the processors show traits of being turnkey suppliers.

Beef steak is a highly customized product in terms of quality, size, weight and overall appearance, requiring a great degree of coordination between producer, processor and retailer. In this sense, both beef producers and processors are turnkey suppliers for retailers, fitting the modular value chain. However, coordination and cooperation exist more fully between processors and retailers. The exception to this is for specific premium niche products such as Aberdeen Angus steak in the case of the UK. Producers, while supplying a customized product, are more akin to suppliers in a captive value chain where smaller suppliers are dependent transactionally on bigger buyers. This dynamic is reinforced by the fragmentation in scale and location of beef production, compared to the levels of concentration in both the processing and retailing sectors that have occurred in both the UK and Germany, giving producers little in the way of alternatives to whom they can supply. In the UK the distribution of beef producers is very diverse as 71% of producers have herds of less than 30 cattle. In Germany more than 73% of the farms own less than 100 cattle. There has been rapid concentration at the slaughterhouse and processing stage. In the UK, the nine largest abattoirs account for 44% of total cattle processing, accompanied by a rapid decline in the number of smaller and regional slaughterhouses in recent decades. In Germany,

more than 70% of cattle slaughter is undertaken in the ten largest processors, with four companies accounting for more than 50%. Beef (steak) is sold mainly through the large supermarket chains in the UK, with the largest five companies responsible for 64% of retail meat sales, and the top nine accounting in total for 87%. Throughout Europe, the economic margins are only positive for the top third of beef producers. If you add non-cash costs e.g. family labour, interest on working capital into value calculations, not even the biggest producers are in profit according to European Commission calculations.

The UK study examined the stakeholder perceptions of fairness along the beef cattle to steak value chain, through in-depth interviews and an interrogation of statements taken from the public record. Issues around fairness focus on the distribution of value, that are linked to the farm gate prices paid to producers and the specifications and grading processes used in the pricing mechanisms. A key concern that emerged is the relative lack of transparency and effective communication across the chain compared to other agricultural sectors. Stakeholders discussed information asymmetries and limited information sharing between all sections of the chain, and tensions caused by feelings of mistrust in some key relationships. The dynamics were particularly visible in the different perceptions of the grading of the prime steak cuts from the carcase, where relatively recent changes led to price falls for the producers. The producers argued that this was too short a notice to respond accordingly given the cattle production cycle for cattle to meet the revised grading requirements. For the processor the revised grading standards were to meet the needs of their main buyers, the supermarkets. The processors felt that the producers were not thinking in terms of the market demands for the end product. Here, the information exchange was seen as being closer and more open between the larger processors and the retailers.

In response to these concerns, various regulatory interventions have been introduced in the UK. A voluntary processor code of practice for the purchase of cattle was introduced in 2015 to enhance levels of transparency in transactions between producers and processors, and to offer additional protections to producers from changes in specifications and requirements. For the producers the code has two main shortcomings. Namely, it is voluntary and not mandatory, and that two of the major processors did not sign up to it. Consequently, producer representatives still feel that the processes of grading and pricing are still lacking in fairness. More broadly, there have been moves to increase transparency along the value chain through technology-applied improvements in traceability, and video identification of the quality features of the prime cuts and their grading being made available to all stakeholders.

1.4.3 FARMED SALMON FROM NORWAY (CHAPTER 7)

The farmed salmon value chain is a producer driven global value chain with demand for the product being greater than the supply. The large vertically integrated aquaculture companies have the greater power in the chain and a strong bargaining position against the supermarkets that are the lead buyers in the value chain. Retailers favour buying from large companies as they can provide more stable supplies and lower transaction costs. While salmon has mainly been sold as a commodity, producers are focusing on developing value-added products, through branding and differentiating their products on the market. The trend is a move from fresh whole salmon to fresh boneless cuts, convenience food and ready to eat. Producers have invested in technological and production competencies according to technical

standards as part of the regulatory framework and industry initiatives. Beyond the regulatory requirements, there are a number of voluntary standards initiated by and for the producers like ASC (Aquaculture Stewardship Council), Global GAP and/or Best Aquaculture Practices (BAP), which are rapidly becoming a requirement to gain access to market.

The governance structure has developed over time from the market framework (based on selling produce on the spot market) to hierarchies where the organization of transactions and asset specificity has been influenced by structural changes, including horizontal and vertical integration as well as the concentration of supermarkets. Structural changes and consolidation of aquaculture companies have reduced the number of farming companies and has helped companies take advantage of economies of scale and strengthened their position on global markets. The inter-firm relations of producers and their buyers is characterized by free market exchanges where products are sold on the spot market, however there is a trend of long-term contracts between large integrated companies and retail or large secondary processors. Secondary producers are in the middle in the value chain and have a weak bargaining position against retailers who operate with fixed margins. When the spot market is high the secondary producers and traders may suffer. Consequently, the salmon chain governance structure is best described as a “hybrid” one where the governance and inter-firm relationships are characterized by a range of forms from markets to hierarchy, where modular, relational and captive structures can be identified depending on the different size of the companies and whether they are vertically integrated.

Salmon prices have historically been very volatile similar to any other food commodity that is influenced by biological uncertainties. These have an impact on stocks of available biomass and thus put constraints on stable supplies and consequently influence the price. High salmon prices have been explained by increased cost of production, however there are ongoing investigations on potential price coordination or fixing in order to sustain and possibly increase prices of Norwegian Atlantic salmon.

Key uncertainties within the salmon farming sector industry concern biomass development (production growth) and future prices. Combined with long production cycles, these uncertainties represent a large challenge for the salmon producers including additional cost of preventive measures and mitigation in the case of the occurrence of salmon lice, diseases, and escape. The challenges related to sea lice have been the main cause for the increase in cost per kg over the last few years and recently algal bloom has caused serious problems in Norway. The environmental impacts of aquaculture are reflected in the regulatory framework that focuses on aquaculture licenses and maximum allowable biomass to ensure the sustainable growth of the sector. The growth of the sector is limited by the regulatory constraints linked to these concerns because of the occurrence of sea lice and potential environmental risks associated with sea cages. Future plans are focused on land-based operations or further offshore closed cages. Licenses with a focus on environmental issues have been the main focus of aquaculture regulations. In terms of private governance, companies have been addressing the biological challenges through uptake of standards like ASC and reporting on corporate social responsibility (CSR). CSR address the issues of sustainability largely as a branding exercise for the purposes of attracting and retaining customers and gaining trust from consumers. However, there is a lack of consideration the social impacts of salmon farming and in

particular further research should be focused on the broader aspects of sustainability, namely the “social license to operate” which is concerned with the acceptability of socio-economic, socio-cultural and environmental impacts within a local context.

1.4.4 TOMATO TO PROCESSED TOMATO IN NORTHERN ITALY (EMILIA-ROMAGNA) (CHAPTER 8)

The case study focuses on the North Italian production area for processing tomato covered by the Inter-branch Organization North Italy for Processing Tomato (IBO North Italy Processing Tomato), set mainly in the Emilia-Romagna region. The main relationships are between the growers, Producer Organisations, Cooperatives, the processing companies and the retailers. More than half of the processed tomato goes to the food industry at 52.5%, while 30.9% goes to retail distribution, and 16.7% to HoReCa. The major part of the processing takes place between the month of July and December

The processing tomato production chain is a localised agro-food system, characterized by geographical proximity, long and consolidated relations between agricultural production and local industry, and a distinctive governance system influencing the economic performance at the local level. The agricultural production in the region is characterized by a cooperative culture. Tomato producers are members of local and/or interregional POs or are in cooperatives that produce and process tomatoes. POs make collective purchases of means of agricultural production, give technical assistance and advice to their members, and sell collectively to processing industries. POs also lead negotiations with the processing industry and organize collective purchases of production inputs. In this region the “District of Processing Tomato”, a union of POs, processing companies, local institutions, and local research centres was set up which subsequently evolved into the Inter-branch Organization (IBO) North Italy for processing tomato confirmed under national legislation, in 2011.

The IBO includes the producer organizations, the processing companies, the cooperatives, the professional organizations and entrepreneurial associations. Distribution and retailing are not part of the IBO North Italy Processing Tomato. Single producers are not allowed to contract directly with processing industries outside of the POs. The IBO is the lead actor in the coordination of production and processing in the North Italian processing tomato value chain. The IBO does not intervene actively in trade negotiations (e.g. prices, volumes etc.) within the value chain, but exerts a key influence on market stabilization and organization. It ensures that the framework contract rules are applied in the annual price negotiations between the POs and the processors. Also, it provides data and information to the POs and other members. This reduces the asymmetries of information that are found in some of the other value chains examined in this work.

Each year the contract negotiations result in a reference price being set which acts as an agreed starting position for the more detailed price setting and volumes around quality factors of the sold product as well as volumes that take place between the producers and the processors. However, the IBO framework can be vulnerable, as when time limits are not met for setting up the supply contracts and for payments. Interviews with processed tomato stakeholders revealed that some members might want to exit the IBO, and do so, as they prefer not to work with a reference price. Each year members may have difficulties to agree on a price, leading to dissatisfaction with

the final outcome. For some interviewed stakeholders, the IBO allows for necessary market concentration and social collaboration between the actors of the value chain that improves the competitiveness of the IBO. Other interviewees, such as the representative association of agricultural producers, maintain that the IBO does not have enough influence. They say that the IBO has no real influence on members, because it lacks decision-making power. As a consequence, this situation can generate delays for the yearly price agreements. This reflects other work reviewing the impact of IBOs that has found “little if any impact upon possible existing asymmetries in the bargaining power of the involved actors” (Directorate-General for Agriculture and Rural Development 2016: 9).

What the IBO does provide is a setting where power can be shared more equally between the producers and processors than where there is a lead firm. However, when the whole value chain is set against the more abstract GVC governance framework, then an array of relevant traits can be identified. At the first stage or level of the value chain, within the IBO framework, the governance between the producers and the processors is more one of relational suppliers. At the next stage between the processors and, in turn, the retailers, the food manufacturing industry, and the food service, different governance features emerge. With retail there are aspects of both the modular and captive model, while the market model is more identifiable in the relationships with the food manufacturing and service sectors.

1.4.5 Wheat to Bread in France (chapter 9)

Bread consumption in France still embodies the specific cultural role of the daily baguette produced and purchased from the traditional bakery. Consumption of bread in traditional bakeries currently represents around 50% of the national bread consumption. Key actors in the wheat to bread chain are the large millers, who are mostly large producer owned cooperatives. The millers control the supply of flour mixes to the traditional bakeries, putting the bakeries in a relatively captive relationship with the large millers. Hence, the millers impose their standards through their flour mixes and so protect and add value to their flour, the process of valorisation. The milling industry is very concentrated and most of the milling wheat production is collected by the biggest cooperatives and then processed through their own mills. Furthermore, the continued existence of the traditional bakeries is supported by national legislation, passed in 1998, that was heavily lobbied by the large millers. The law stipulates that professionals who do not ensure the kneading of the dough by themselves, its fermentation and shaping as well as the bread baking cannot use the name "baker" and the commercial sign of "bakery" for their point of sale. The dough and the breads cannot at any stage of production or sale be frozen. The law has helped to slow down the market share loss of the traditional bakeries to the industrial ones. Nonetheless, the industrial bakeries, notably via supermarket sales, are gaining a 1% market share from the traditional bakery every year. Large supermarkets control 30% of the industrial bakeries, also.

The large millers also sell their flour to the industrial bakeries. The industrial bakeries can be described as fitting in a relational governance mode with the millers, as they are still relatively dependent on the flour mix they produce but able to purchase some of the flour from other countries, outside of the domestic market. As the industrial bakeries have better access to other non-domestic flour providers, one can identify aspects of the market governance model as well. In addition, there is a growing export

outlet for milling wheat, mainly dedicated to bread production in foreign countries, driven by the very large international trading groups. This can be characterised more as a relational governance mode between the traders and the producer cooperatives, as traders depend on the producers to deliver homogeneous supplies to meet the importing actors' requirements. As a result, the governance of the wheat to bread value chain can be described as "multipolar", as different actors are driving it. The producers are in a situation of captive suppliers towards cooperatives that are controlling 70% of the wheat market, while wholesalers control 30%. Meanwhile, for the millers the best valorisation comes from their sale to the captive traditional bakeries. However, the growth industrial bakeries are growing the market share that provides lower return to the millers and, in turn, the producers.

The producers and their cooperatives have to valorise one ton of soft wheat out of two on the international market, with wheat to bread chain actors being dependent on the international market on three main aspects. Firstly, because the trade barriers for imported wheat are quite low (especially for countries benefiting from specific trade arrangements with Europe), the domestic market has to align with world prices. Secondly, as the producers and the cooperatives do not always know on which market the wheat will be sold at harvest time, wheat quality has to be adapted to the conditions of both domestic and international markets regarding the price and quality requirements. Finally, because the domestic wheat market and the different forms of valorisation of wheat (such as bread, feed, ethanol, starch) are relatively saturated, the main margins for growth is the sale of wheat to the international markets. Nonetheless, there is increasing competition from other exporting wheat producing countries for access to these markets.

1.5 REFLECTIONS AND CONCLUSIONS

The studies confirm that the nature of governance in value chains covers inter-firm relations but also includes private governance initiatives and public policy and regulatory interventions. The nature of each food value chain, from beef to bread to processed tomato, has its own particular features and characteristics more specific to that sector. There are important structural features in each value chain that set boundaries within which the dynamics of governance take place. The actors at key stages of each value chain may be in a better structural position than others, which can give them an advantage in the negotiations and bargaining over contracts. In all of the value chains the nature of the governance is changing with the increasing levels of corporate concentration at different stages of the chain. The concentration at the downstream stage of food retailing means that large multiple supermarkets are key gatekeepers to the majority of consumers in the selected European markets. In the beef, dairy and wheat industries studied, the processors are undergoing concentration though mergers and acquisitions, reinforcing their advantages in the buyer-supplier relationship with the producers. The Norwegian farmed salmon chain sees the corporate concentration at the producer end as salmon farms are integrated vertically into large corporations at all stages of the production cycle, and these corporations merge horizontally. This value chain stands out from the others as an example where market demand for the product is greater than the supply. However, further growth of production in Norway is compromised by the salmon farms causing pollution and pest

disease problems, which are increasingly subject environmental regulation threatening to restrict further production growth. These regulations are reinforced by private standards around sustainability issues that the industry has introduced and are increasingly important for market access through the retailers. The extension of private standards can be seen in retailer led development groups with their suppliers in the UK dairy to milk chain. There are also technical standards that are common in an industry, such as the EuroGrid system for beef, or protein content in harvested wheat grain, that impact upon the value of the food product such as beefsteak or milling wheat for bread flour. Producers voice concerns regarding the information asymmetries that exist around technical standards and their conversion into pricing of the product, where lack of transparency is a cause for complaint, both with a homogenous commodity such as milk as well as a high value product such as steak.

Stakeholders' views on fairness are focused on price setting and the means by which pricing decisions are made. This was a visible concern raised by milk and beef producers as sellers. Conversely, the processors, as the buyers, raise a range of factors that they have to take into account to ensure profit to their own business when negotiating the buying price. For example, the processors' profitability is impacted by the need to use of the rest of the beef carcase, or the volatility of world milk prices and the low, loss leader pricing of milk by the supermarkets. It was notable that the interviewees very rarely mentioned the types of unfair trading practices, as defined and laid out in the Directive on unfair trading practices in the agricultural and food supply chain. Rather, it was the subjective experience of price setting (and related volume agreements, for example) in their particular value chain and sector where concerns around fairness and transparency were most explicitly articulated.

The EU and the national governments have sought to address some of the power imbalances that producers face. The passage of the UTP directive under the lead of DG Agri is a case in point. In addition, the promotion of producer organisations has been extended into agricultural sectors beyond the "Mediterranean products" to sectors such as Dairy, as under the EU's Milk package. However, the impact of POs in strengthening the bargaining position of farmers in value chain bargaining and pricing decisions is not clear, as the studies from French Milk and Italian processed tomato show. This points to the need for further research on the efficacy of producer organisations in balancing unequal power distribution in specific the value chains (see also, Fałkowski & Ciaian 2016). Cooperatives feature in both of these examples as well as in the German milk sector. The findings from the studies presented indicate examples where individual producers can feel constrained by their membership of cooperatives and lacking individual agency, as in the Italian tomato and the German and French milk studies. In the German milk sector producers find it hard and costly to move from one cooperative to another. Interbranch organisations are another mechanism that exists to bring actors in the value chain together, usually producers and processors, to collaborate over the frameworks for contractual negotiations for the purchase of the raw product. In the processed tomato value chain, producers expressed some dissatisfaction with the operations of the Northern Italian IBO, notwithstanding the collaborative culture and setting that it provides. The UK Government has encouraged voluntary codes of practice to try to improve and make more transparent contract negotiations between the processors and producers in the beef and milk sectors. There are shortcomings with these initiatives to date, as the beef forum lacks the participation of two of the largest processors, while the Government

currently favours mandatory legislation for the dairy code of practice. Of course, the large corporate players have influence upon policy as with the example of the French millers in lobbying for national legislation to protect the traditional bakeries who are their captive retail channel.

There is subjectivity in the views of stakeholders over issues such as price negotiations that must be considered when assessing fairness in value chains. Interpreting fairness as an absolute state for a food value chain may not be achievable, not least because it can cover a range of dimensions. Rather, moves towards greater fairness may be more practical and measurable moving forward; that is, towards fairer value chains. The need for industry, and more particularly for policy makers, is to find the most appropriate mechanisms and interventions to achieve fairer trading and working conditions in food value chains, that are suitable to each respective agricultural and horticultural sector as well for the agri-food industry as a whole. At both the sector level, and across all food value chains, the important structural features and their impacts on intra-chain bargaining must be taken into account.

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2. GOVERNANCE OF UK DAIRY COW TO LIQUID MILK VALUE CHAIN

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2.1 OVERVIEW OF UK LIQUID MILK VALUE CHAIN

The United Kingdom is the third biggest producer of liquid cow's milk in the European Union[3], accounting for 9.6% of total production. British dairy farms produce 14 billion litres of raw milk a year, 51% of which is processed for direct consumption, making the UK the biggest EU producer of drinking milk, contributing one fifth of the EU's supply in 2016. (Dairy UK, 2014, 2017, House of Commons, 2016a, Eurostat, 2018). This contrasts with other EU countries, where on average 30% of raw milk becomes drinking milk, with a larger percentage used in the production other dairy products (House of Commons, 2015a).

It is estimated that 98% of British households purchase dairy products regularly (Dairy UK, 2017). Despite this prevalence in the market, recent consumer trends towards veganism and threats perceived in changes to national regulations and public health advisory information have raised concerns for the industry[4]. Along with the uncertainty caused by Brexit, this has led to exports, especially to non-EU countries, regarded as key to the sector's long-term sustainability. Export growth is predicted as demand from Asia, South America and Eastern Europe is rising (House of Commons, 2016c). Most of this growth however is expected to be for dairy products rather than liquid milk as its perishability makes export potential marginal. Although price premiums can be made through organic or other niche forms of production, creating additional value in conventional liquid milk is challenging due to a relative lack of product diversification and differentiation options.

Since the nineties the European dairy industry has undergone significant restructuring away from regulated price controls and quotas on production towards a more competitive market system. In the UK, the abolishment the Milk Marketing Board in 1994 de-regulated the dairy industry, removing minimum price guarantees for producers. Additionally, the Milk Board, first established in 1933, had functioned by linking prices paid to producers to the end use of the raw milk, which ensured additional value on liquid milk, turning its highly perishable nature into a price premium compared to other storable forms of dairy products (Bates and Pattison, 1997). At EU level, the withdrawal of the EU milk quotas in 2015 is of special significance. The quotas, part of the Common Agricultural Policy since 1984, had been introduced to address structural

[3] Germany (20.9%) and France (16%) are the two biggest producers of cow's milk (Eurostat, 2018)

[4] In 2016 there was speculation about whether the UK's new 'sugar tax' would include naturally occurring sugars found in milk drink products. In the end, in part due to industry lobbying, products containing 75% or more milk were exempt on grounds they contained nutritional benefits. The industry has also campaigned against the revision of Public Health England's *Eatwell Guide.* which recommended consumers reduced their dairy intake by half (Dairy UK, 2016).

oversupply problems in the milk market in the eighties, the so called “milk lakes” and “butter mountains” (House of Commons, 2015a).

These reforms, designed to establish more market-oriented governance of the sector, represented a profound structural change in market conditions, leading to increased price volatility for producers (see figure 1). While all markets experience price variations, the 2015 UK parliamentary enquiry into Dairy prices described the “frequency, suddenness and sharpness of milk price fluctuations that have brought a new volatility” to the sector (House of Commons, 2015a, pg. 5). Today, raw milk prices are linked to the performance of dairy products on international commodity markets, with the 2014 Russian trade embargo on EU products and recent decline in Chinese demand being linked to lower prices experienced in Europe (European Commission, 2016, House of Commons, 2016c). Global markets are particularly important for the UK dairy industry because such a large percentage of its raw milk is sold in liquid form, with less storage options than for cheese, butter or powdered milk in market crises or price slumps. (House of Commons, 2016d).

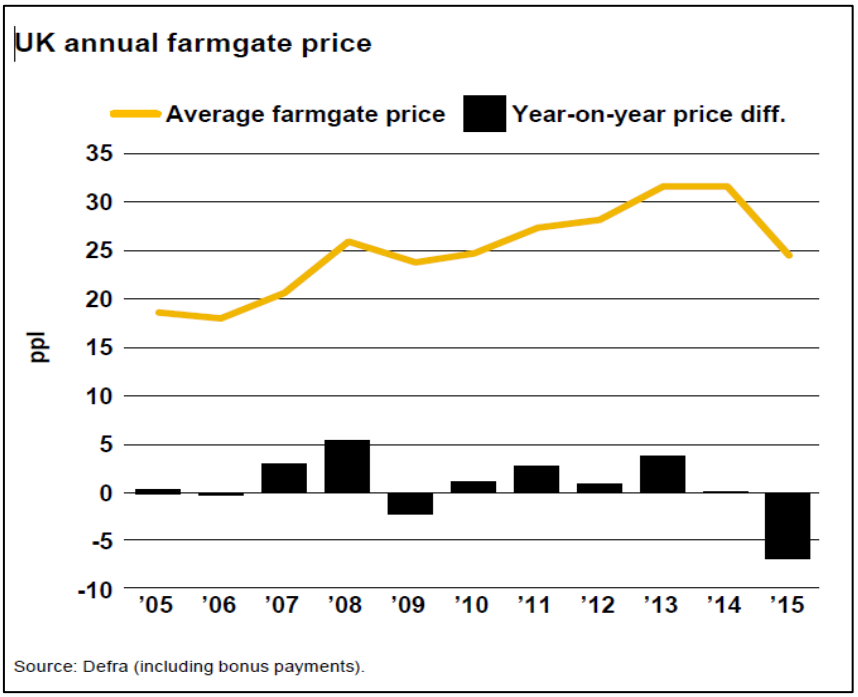

Figure 2-0-1 UK annual farmgate price for raw milk. Source: AHDB, 20

It is these changes to the industry and the resulting volatility that led to many of the issues of value distribution and fairness emerging in the value chain. Despite the broad shift in governance away from direct market regulation, various policy interventions aimed primarily at stabilizing producer income and resilience in the marketplace have been introduced. Dairy farmers remain supported through the Common Agricultural Policy, and the sector is characterized by high levels of subsidy dependence, mainly in the form of direct payments. Averages from 2011-2013 for example show that 49% of dairy farm incomes in the EU were from subsidies (European Parliament, 2017a, pg. 46). There have also been a number of more targeted market-oriented interventions, in particular a series of support measures known as the ‘Milk Packages’

were adopted in 2012 to aid the transition of the end of production quotas in 2015[5]. Provisions in the Milk Packages provide financial aid and regulatory instruments to help increase the bargaining power of producers and to help improve their position in the value chain. Significant among these is legislation allowing dairy farmers to form producers' organisations, and the provision for member states to introduce mandatory contracts between farmers and processors if they wish.[6] Similarly, in 2016, the EU Agriculture and Fisheries Council introduced supports to improve access to investment finance for farmers and increasing transparency on price signals.

In the UK, fluctuations in milk prices have been the subject of two parliamentary enquiries (House of Commons, 2015a, 2016d) and media and consumer interest and have led to farmer protests on more than one occasion.[7] In response, there have been two significant industry initiatives from food retailers and dairy processors: Many of the larger supermarkets have initiated development groups for their liquid milk suppliers and agreed contractual terms and pricing mechanisms above market prices. While these arrangements, known as retail-aligned contracts, only cover a small percentage of producers, they represent a significant percentage of the total milk volume sold in the UK. Secondly, in 2012, the processing industry and the National Farmers Union agreed a Voluntary Code of Best Practice on Contractual Relationships (VCOP) which created minimum standards for contractual agreements and practices, and increased transparency in pricing mechanisms used by processors. The effects of these interventions on the governance of the UK milk chain are discussed in the findings section of this report.

[5] https://ec.europa.eu/agriculture/milk/milk-package_en (Date accessed: 24th June 2019)

[6] In the 2015 milk package the UK dairy industry received £26.2 million, which translated to average sized dairy farms across the UK receiving between £1,800 to £2,500, depending on volume of production (House of Commons, 2016a).

[7] https://www.theguardian.com/business/2015/nov/04/tesco-deal-dairy-farmers-milk-price-protests (Date accessed: 24th June 2019)

2.2. STRUCTURE OF UK LIQUID MILK VALUE CHAIN AND THE GLOBAL VALUE CHAIN GOVERNANCE MODEL

The liquid milk value chain is primarily made up of several groups of actors, producers, processors and retailers as shown in figure 2.

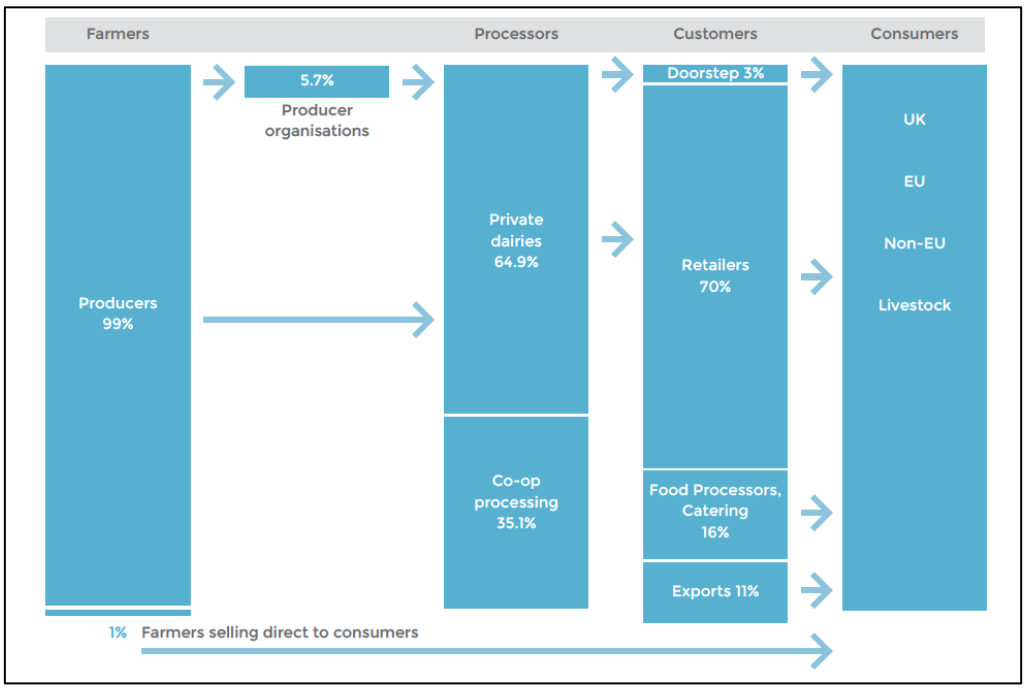

Figure 2-0-2 Liquid milk production flow. Source: Dairy UK, 2017

Dairy farming occupies 8% of UK agricultural land, with the main production regions in Devon, Somerset, Cheshire, Cumbria and Wales. Currently, there are approximately 13,000 dairy farmers and 1.9 million cows in the UK dairy herd (Dairy UK, 2017). These figures have been in decline for the last two decades as producers are exiting the industry in large numbers[8], even though, as figure 3 shows, the average herd size per farm holding has increased. These structural changes correspond with improved productivity and increased yields per cow. Further efficiencies in farm management have also led to a flattening of traditional peaks in production after the May calving season, with a more consistent year-round production levels now the norm (House of Commons, 2016a, Dairy UK, 2017).

Once produced, milk haulers collect raw milk from farms and deliver it to dairies for processing. In the UK, this process is administered through the Dairy Transport Assurance Scheme (DTAS). This industry scheme ensures that food safety requirements, especially HACCP procedures, are followed during transportation and haulers are subject to annual audits and inspections. DTAS covers approximately 90% of milk transportation and all Red Tractor assured milk is required to be moved using

[8] There were, for example, 34,500 British dairy farmers and 2.6 million dairy cows in 1996 (House of Commons, 2016a).

DTAS as part of its guaranteed "farm to fork" assurance. Haulage companies are typically contracted by processors, but around 15% of British fleet are owned directly by processors. (Dairy UK, 2017).

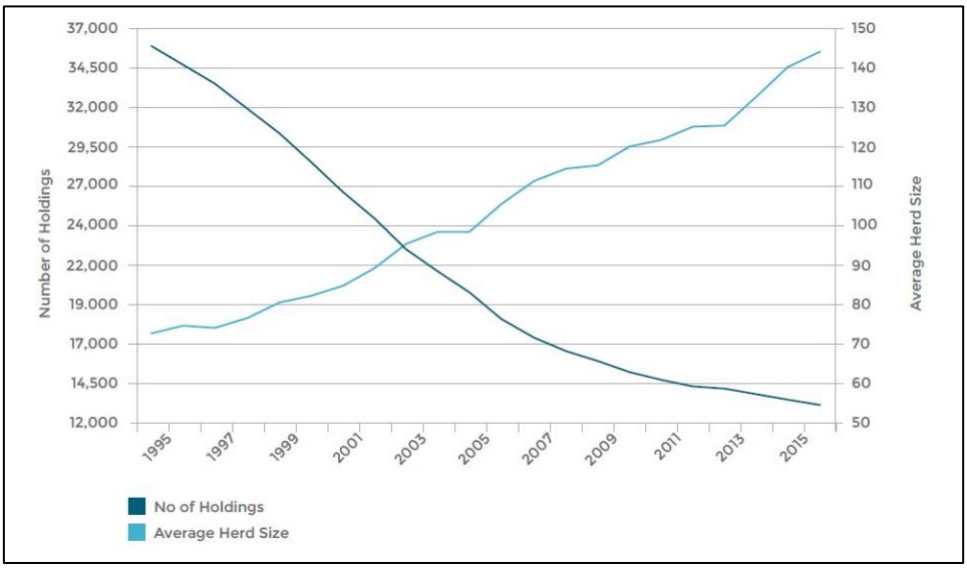

Figure 2-0-3 National herd size and number of holdings. Source: Dairy UK, 2017

In 2015, there were 242 companies processing milk for drinking milk consumption in the UK (AHDB, 2016c). The level of concentration in the processing industry is significant, with the top 9 dairies (2% of the industry) accounting for 79% of milk intake for processing (AHDB, 2017a) and the top 7 responsible for 91% of drinking milk output. Three of the biggest processors are farmers' cooperatives who together process 35% of drinking milk output: Arla is a European-based cooperative, First Milk and Dale Farm are UK-based cooperatives. The other major dairies in the UK are Dairy Crest and Muller, although as of 2015, Dairy Crest no longer supplied drinking milk, selling this part of its operation to Muller. Finally, within the organic milk sector, OMSCO is the UK's largest organic dairy cooperative, managing approximately 65% of organic milk supply[9]. As well as concentration, diversification is seen as a vital strategy for processors to spread the risk inherent in liquid milk production. Processors with greater dependency on liquid sales seen as holding less value chain power than those able to supply branded dairy products.

In terms of sales distribution of liquid milk, big food retailers are the key point of access to consumer markets for drinking milk[10]. In 2016 their combined market share by *volume* of liquid milk sales was 72.5%, and 69.8% by *value* (AHDB, 2016). In contrast, 'doorstep' delivery direct from processors to consumers, which accounted for 45% of sales in 1995 is now at 3%. Going back further, in 1980, 89% of British households had their liquid milk delivered (SFT, 2015, House of Commons, 2016a). Consumer purchases of non-supermarket branded milk are primarily in the form of processor branded milk (e.g. Arla's "Farmers Milk") sold through supermarkets and smaller retail

[9] https://www.omsco.co.uk/ (Date accessed: 24th June 2019)
[10] Data based on the top 5 multiple food retailers in 2016: Tesco, Sainsburys, Asda, Morrisons and Co-operative. In 2017, Aldi replaced the Co-op to become fifth biggest UK supermarket: https://www.bbc.co.uk/news/business-38890977 (Date accessed: 24th June 2019)

outlets. Processors also control wholesale, food manufacturing and food service sector sales.

Within this broad structure of production, the UK milk industry is organized into two further categories, which in effect create two distinct value chains. The first is between producers whose end customer is a processor, known as processor or non-aligned contracts, and the second is for those who are contracted to supermarkets through retail-aligned contracts.

To control the large volumes of milk they buy and sell under their 'own brand' labels, the 5 major British supermarkets along with some other food retailers have set up producer groups for their dairy suppliers[11]. These groups are the central forums for contractual negotiations and standards setting. Producers enter into integrated supply or aligned contracts, with pricing mechanisms guaranteeing a farmgate price for raw milk that covers the cost of production and reflects changes in the costs of feed, fuel and fertilizer. Beyond price, these contracts usually include a series of animal welfare and environmental requirements set by retailers, and various production supports for producers (Dairy UK, 2017). Sainsburys supermarket, for example, provides annual veterinary visits and advice on herd health for its producers, as well as independent financial advice and performance-based bonus schemes[12]. In this scenario, retailers' contract one of more of major dairies to pasteurize and process their own-brand milk, supplied by aligned producers in segregated supply chains.

While the greatest volume of drinking milk is sold through supermarket own-brand labels, the number of producers aligned to such schemes appears to be approximately 2000, or less than 20% of UK dairy farmers.[13] This means that the majority of producers are therefore in non-aligned contracts, some of these producers (those operating in more niche markets e.g. organic milk[14]) can attract a price premium but the others are reliant on and vulnerable to, market volatility (House of Commons, 2016c) as they must negotiate prices and any contractual arrangements with individual dairies. Non-aligned contracts have been, as the next section will show, an important area for policy interventions around unfair trading practices.

Looking at this two-tier structure from a Global Value Chains governance perspective (Gereffi et al, 2005), it is possible to see parallel value chain models emerging (see figure 4). Compared to other commodity chains, there is relatively little customization or asset specificity required for liquid milk, meaning that the codifiability of buyer specifications is minimal in transactions between firms. In this definition liquid milk producers are commodity suppliers of a typically homogeneous, standardized product. However, in the UK value chain, the differences in contractual relationships between producers have created a more complex set of inter-firm relations. In the UK case, producers supplying retailers through aligned contracts follow a more typical *modular or relational* value chain where relationships, as the next section will show, are defined

[11] It is unclear what percentage of the total drinking milk supplied by supermarkets originates from their producer groups. However, estimates based on information from company websites suggest it is usually over 90%, with any deficit being fulfilled by non-aligned dairy producers.
[12] https://www.about.sainsburys.co.uk/making-a-difference/sourcing/british/milk (Date accessed 23rd June 2019)
[13] Figures based on analysis of supermarket company websites accessed on 12th November 2018: Tesco (600 farmers), Sainsburys (290), Asda (250), Morrisons (350), Cooperative (200), Marks and Spencer (40), Waitrose (50).
[14] Organic milk is the largest sector within organic dairy, representing 5.1% of all UK milk retail sales (OMSCO, 2019). There are also other emerging niche markets, such as pasture-fed milk: https://www.pastureforlife.org/why-pasture/grass-fed-meat-and-milk-you-can-trust/ (Date accessed: 23rd June 2019)

by close communication, reputational ties and reasonable high levels of trust and collaboration. In this model, the retailer is the lead firm and producers and processors are 'turn-key' suppliers providing a customized product[15] to buyer requirements expressed through producer development groups.

In contrast, producers operating outside retailer contracts are more comparable to the *captive* value chain model. In this scenario processors act as the 'lead firm' and producers become 'captive suppliers' because they are largely dependent on transactional relationships with bigger buyers. Producers are typically contracted to buyers over a period of months or years, making it harder for an individual producer to switch to a different producer easily, a situation that is compounded by the perishability of raw milk and the problems of storage associated with it.

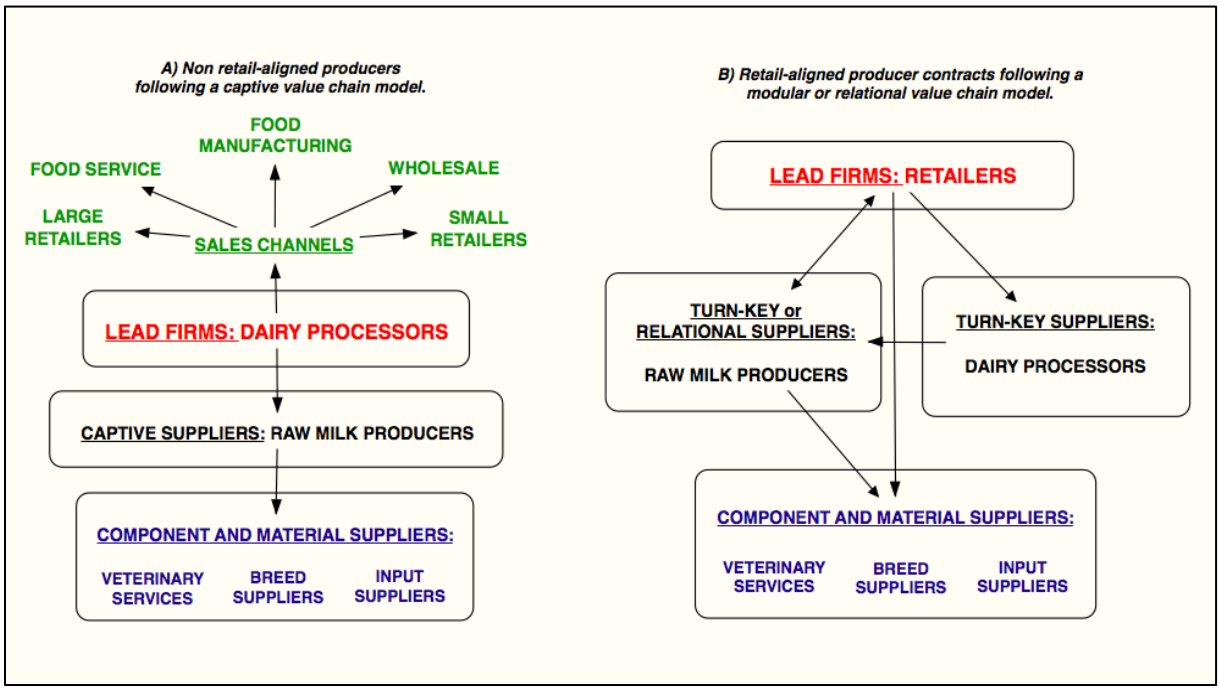

Figure 2-0-4 UK liquid milk GVC models. Source: The authors, 2019. Arrows indicate codified informational flows rather than direction of product through the value chain.

[15] Customization is this scenario refers to the customised nature of contractual relations between producers and retailers, and the particular specifications of production process e.g. segregated supply guarantees, which are not typically found in the non-aligned value chain.

2.3 EU AND UK GOVERNANCE: KEY POLICIES AND REGULATIONS

Table 1 below contains the main European and UK policies, regulations and private standards pertaining to dairy cattle and liquid milk production in the UK. They cover a range of issues from food safety and hygiene, animal welfare and the use of medicines in livestock production to fraud and transparency, sustainable development and labour and social issues.

Stakeholder consultation showed that adherence to industry standards, in particular the Red Tractor scheme[16] is particularly important to retailers for codifying expected farm practices and achieving market creditability. Red Tractor certification covers staff and labour, traceability, animal health and welfare, husbandry and veterinary services, animal housing, feed and water and nutrient management, livestock transportation and responsible use of agrochemicals (Red Tractor, 2018a). One stakeholder noted that despite the importance of standards in the value chain, some producers lacked, in the stakeholder's view, a *"mindset of compliance"*, specifically around seeing compliance as a continuous process and daily practice for farms (Dairy agricultural manager, UK retailer).

Most retailers who purchase liquid milk have also developed their own company standards and specifications for suppliers.[17] These standards, often designed and/or verified in consultation with third-party organizations, usually go above industry-wide schemes. Stakeholders discussed that they found this was particularly important for animal welfare issues. Concerns from consumers and campaigners means that actors in the value chain are keen to communicate good practice in this area, and this can drive strategic decisions around production specifications[18] as this extract from interviewee demonstrates: *"From our perspective, we fight back (against activists) by linking in with RSPCA and different vet audits, doing due diligence (and) demonstrating that throughout the process. It does help to have independent voices and welfare specialists"* (Dairy agricultural manager, high-end UK retailer). This kind of reflection show the importance of private standards in achieving trust and transparency in the milk chain.

[16] Established in 2000, Red Tractor covers 83% of farm production in the UK. There are currently 78,000 farmers registered on the scheme and 700 companies licensed to use Red Tractor labelling on packaging (Red Tractor, 2018b). In 2014, there were 59,000 members, of which 11,000 were dairy. This represented 95% of litres of milk produced in the UK (Red Tractor, 2015).

[17] For example Marks and Spencer have their own 'Select Farm Assurance' standard: https://corporate.marksandspencer.com/sustainability/food-and-household/product-standards/farm-animal-health-and-welfare#194c9458cf114b939ad22ce299a0bc0e (Date accessed: 23rd June 2019)

[18] A recent example of this is the UK retailer Tesco revising its code of practice for dairy calves, requiring suppliers to rear the calves in hutches of pairs or groups rather than individually. Tesco based this decision on research that calves kept this way were shown to have reduced stress levels and more social contract (Farmers Weekly, 2018).

Table 2-0-1 Key EU and UK Policies and Regulations. Source: The authors, 2019

Common Agricultural Policy • Basic payments and other income support e.g. young farmers scheme, payments for sectors in difficulty, compensation for farmers operating in areas of natural or specific constraints. • *EU Agricultural Fund for Rural Development* (1305/2013) – farm level advisory services. • *Common market organisations (*1308/2013) – Works to reduce bargaining power gap between producers and other parts of the chain, and to stabilize markets/prices for farmers in selected sectors including milk. Incorporates fraud prevention and authenticity protections. and restricts use of animal health products to ensure quality and safety in the chain.
General Food Law (178/2002) and Official Controls (2017/625) • Principle procedures on food safety including work of Food Safety Authority, RASFF and other traceability systems, product withdrawal and recall. • Regulates fraud and adulteration prevention, labelling, advertising, presentation, display. • Animal health and welfare provisions, control of animal by-products in food chains. **UK implementing regulations or applicable UK regulation:** • The Food Safety and Hygiene (England) Regulations (2013) • The General Food Regulations (2004) - in Scotland and Wales • Food Standards Act (1999)
Organic Regulations (834/2007) and Implementation (889/2008) • Stipulates organic production standards, control and labelling requirements of organic products. **UK implementing regulations or applicable UK regulation:** • Organic production standards are regulated through organic certification bodies who are approved by the government. The largest certification body in the UK is the Soil Association. Organic certification covers livestock production, processing and feed.
Competition and Fairness • Use of Competition Law to ensure fairness. Controls on mergers, data-sharing, price-fixing and unfair commercial practices/consumer protection policies e.g. • Unfair Commercial Practices policy (business to consumer) (2005/29) • Misleading and Comparative Advertising Directive (2006/114) • EU Milk Packages: introduced under Common Market Organisation support structures. • EU Agriculture and Fisheries Council (2016), Support package for all agricultural producers including help with access to finance for investment and improvement of transparency. • EU Directive on unfair trading practices in business-to-business relationships in the agricultural and food supply chain (2019). Covering imbalances in bargaining power, fair

dealing in contractual relations, disproportionate transfer of economic risk etc. Due to be transposed into UK law.

Fraud, Transparency, Food Information

- Food Information to Consumers Regulation (1169/2011)

- Labelling regulation (origin, properties, method of production), use-by dates, durability, storage.

- Regulation on nutrition and health claims (1924/2006)

- Regulation on quality schemes for agricultural products and foodstuffs (1151/2012)

- EU Food Fraud Network

UK implementing regulations or applicable UK regulation:

- Food Information Regulation (2014)

Food Safety + Hygiene

- Hygiene rules for food of animal origin (853/2004) and official controls (854/2004)
- Regulation on hygiene of foodstuffs (852/2004) inc. HACCP principles

- Regulation on animal by-products + derived products not for human consumption (1069/2009)

- Regulation on microbiological criteria for foodstuffs and contaminants in food chain (1881/2006)

- Regulation on salmonella and other food-borne zoonotic agents (2160/2003)

- Regulation on material and articles intended to come into contact with food (1935/2004)

UK implementing regulations or applicable UK regulation:

- The Food Safety Act (1990)

- The Food Safety and Hygiene (England) Regulations (2013), Scotland (2006), Wales (2006)

- Veterinary Medicines Directorate – UK government agency monitoring foods for veterinary medicine residue.

- The Dairy Products (Hygiene) Regulations (1995)

Animal Health and Welfare

- New Animal Health Law (2016/429) – prevention and control of animal diseases inc. foods of animal origin, animal by-products

- Regulation on protection of animals at the time of killing (1099/2009)

- TSE Disease control (CJD, BSE etc.) (999/2001)

- Directive on protection of animals kept for farming purposes (98/58/EC)

- Regulation on medicinal products for animal and veterinary use (726/2004)

- Safety of pesticides and plant protection products (1107/2009, 2009/128, 396/2005, 2003/2003)
- Directive on hormone use in stock farming (96/22/EC)

UK implementing regulations or applicable UK regulation:

- Animal Welfare Act (2006) – Welfare of Farmed Animals regulations included in the act (2007)
- TSE Regulations: England (2010), Wales (2008), Scotland (2010)
- The Welfare of Animals Transport Order – England (2006), Scotland (2006), Wales (2007)

Social +Environmental

- EU Pillar on Social Rights – Principles relating to equal access and opportunity in in labour markets, fair working conditions, social inclusion and welfare protections.
- Minimum wage laws - The EU currently has no law on minimum wages, but in 2017 Commissioner Juncker stated that the EU should have such a policy and some MS do.
- Directive on part-time work (97/81), Directive on fixed-term work (99/70), Directive on working time (2003/88), Directive on temporary agency work (2008/104), Directive on seasonal workers (2014/36).
- Small Business Act (2008) – market support for small farms and producers.
- Short food supply chains – financial (and other) supports under rural development policy.
- Late Payments Directive (2011/7)
- Supply Chain Initiative (2013)
- EU Platform on food losses and food waste (2016)
- EU School Milk Scheme: Subsidies to support milk and yoghurt consumption for children.

Private Schemes

- UK: Red Tractor Assurance Scheme for livestock, dairy, crops and fresh produce throughout the whole supply chain.
- UK: Dairy Transport Assurance Scheme: Transportation of raw milk scheme which ensures, food safety regulations are met.
- UK: Voluntary Code of Best Practice on Contractual Relationships
- UK: Courtauld 2025 Commitment (launched 2015) - NGO led campaign to reduce food and drink waste and greenhouse gas emissions in the food industry.
- Dairy Roadmap (started as Milk Roadmap in 2008, initiated by Defra) - A joint initiative between Dairy UK, AHDB and the National Farmers Union aimed at improving environmental impacts within dairy industry, as well as enhancing social and environmental benefits, best practice and innovation.
- Dairy Declaration of Rotterdam (2016) - Signed by the FAO and International Dairy Federation, the declaration commits signatories to delivering Sustainable Developments Goals in the dairy sector.
- Responsible Use of Medicines in Agriculture Alliance (RUMA) and Dairy antimicrobial Stewardship group: Cross-sector initiatives to support best practice in food safety and veterinary medicine usage in animal agriculture.

2.4 GOVERNANCE, FAIRNESS AND RELATIONSHIPS IN THE UK LIQUID MILK VALUE CHAIN: FINDINGS

This last section draws on findings from stakeholder consultation to focus on three main areas of interest: the price paid to producers for raw milk, the contractual arrangements between producers and processors, and specific governance interventions linked to fairness. Whether they are in non-aligned or retail-aligned contracts, most dairy producers in the UK have a contract to sell their milk exclusively to one processor. Stakeholder consultation showed that the type of contract a producer has largely determines the nature of inter-firm relations and behaviour. While perceptions of these relationships and the power asymmetries within them differ across the chain, such perceptions are shown to be key drivers of decision-making and interactions and can have a real impact on the performance of the wider chain.

2.4.1 PRICE AND CONTRACTUAL ARRANGEMENTS

Stakeholders observed that non-aligned contracts tend to create more variable relationship dynamics largely dependent on processor's business needs at the time raw milk is purchased. Pricing mechanisms in these arrangements are typically based on global prices and therefore are more likely to be subject to fluctuations. A particular concern mentioned by interviewees was the exclusivity clause found in most contracts. Exclusivity clauses guarantee that a processor will purchase all the milk from a producer, but it also forbids producers the option of selling any milk to other processors. Contracts stipulate the amount of milk required by processor over a set period and the processor will pay an *A price* for the agreed volume. If the producer produces above the agreed volume, the milk will still be purchased but on a marginal *B price*.[19] This practice, known as A+B pricing, was originally introduced to help manage seasonality of supply, but stakeholder consultation showed its fairness is disputed in the context of frequent price changes/declines when both the A and B price can fall close to and below cost of production. One interviewee for example saw it as *"penalizing producers for market failures"* (Northern English dairy producer and processing cooperative director). Some producers also object to the exclusivity clause and wish to be free to sell milk they produce that exceeds processors contracted requirements to other processors, potentially at a higher price. From the perspective of processing industry however, separating out volumes for different processors would bring logistical difficulties, and could undermine their stability of supply with producers (UK dairy processing organisation).

Concerns about exclusivity clauses are part of wider fairness issues in non-aligned contracts such as unforeseen changes to terms, non-adherence to obligations and sudden termination of a contract. This extract from a farming organisation summarizes how non-aligned contracts are perceived by many producers: *"Most contracts have an anti-circumvention provision in them. It will say we will make sure we do all these lovely things, but somewhere in that contract there will be something that says they have the discretion to ignore everything they said before and do what they want. We are very wary of these sorts of provisions".* (UK dairy farming organisation).

[19] https://dairy.ahdb.org.uk/market-information/milk-prices-contracts/milk-calculator-and-contracts/the-ins-outs-of-ab-milk-pricing/#.XNPtrhRKiiQ (Date accessed: 23rd June 2019)

In contrast, retail-aligned contracts are typically characterized by higher levels of stability in relationships between producers, processors and retailers. Aligned contracts are often coordinated through a retail agricultural manager who manages communication between the dedicated producers and the processor. Each producer will usually have a contract with both the processor chosen by the retailer, and with the retailer themselves. Price is then determined by a mechanism that guarantees producers a price that covers all costs of production plus profit. Different retailers have different ways of calculating what they pay but the result is that producers an additional sense of stability that the price they receive with both cover their costs and not fall below market value. Evidence from stakeholder consultation suggests that retail contracts tend not to guarantee to buy all the milk a producer makes, instead they buy what they use or have forecasted to use, with the rest sold through the processor at the market value. One estimate from one retailer interviewed suggested that supermarkets will typically buy 80-85% of a producer's milk, with the additional being there to create a buffer against loss or shortages in the value chain (Dairy agricultural manager, high-end UK retailer).

Retail-aligned contracts are perceived by much of the industry as enhancing stability of price and security of income for producers, with much less risk of sudden price drops or changes in contractual terms. They are also viewed as fostering fairer and more transparent working relationships, development groups meet regularly to discuss market trends and production issues and can deal with problems collectively. One interviewee characterized the dynamic as *"a three-legged stool"* between producers, processors and retailers, and describing meetings as such: *"we would do a presentation, update in terms of where we sit in terms of sales, performance, different challenges within the business, any new developments, for an hour or so, then sit down and have a meal and a drink"* (Dairy agricultural manager, high-end UK retailer). Another UK retailer reflected the arrangements work well because *"everyone is in the loop"* and working relationships are therefore a *"two-way street*" (Dairy agricultural manager, UK retailer). One dairy farmer and processor director expressed a different view. While agreeing that producers in aligned contracts had received *"the better end"* of the milk prices, those producers, in the interviewee's view, lost control over their production decisions by joining retail groups (Northern English dairy producer and processing cooperative director).

Reflecting more generally, aligned contracts are a way for retailers to increase security of supply of a key commodity, and to act on societal and governmental concerns about the livelihoods of dairy farmers. Interviewees discussed how this was the result of both value chain and brand image concerns, as the following extract shows: *"Within the milk industry, there can be a lot of negative press and PR, and I think that's why we've gone to the lengths that we have. Our milk contracts with farmers. we pay more from a milk price perspective…. It's a costly enough exercise but it's something we've never deviated away from. It's very much from a security of supply perspective, but also from a brand perspective, we want to be close to our farmers, we want to be paying a fair price, and from that perspective, we've probably gone the extra mile, whether its price, contracts, transparency etc. We are not unique in that, a lot of the other retailers have done that, because it's one of the more emotive connections customers have with different proteins"* (Dairy agricultural manager, high-end UK retailer).

The findings from this research so far support the view that retail-aligned contracts can encourage and enhance fairer trading practices in the supply chain, specifically more

stable and higher prices for producers. However, the behaviour described in the interview extract above about going *"the extra mile"* for producers is at odds with the actions of retailers in other areas of the chain. While retailers in aligned contracts typically pay a higher price for milk than processors, the price at which they sell liquid milk to consumers has been seen to decrease the price and perceived value of milk more generally in the industry. One stakeholder perceived milk retail prices as "weapons" in so called supermarket price "wars". They described how discounters like Aldi and Lidl and increasingly online, predominantly non-food, retailers like Amazon, were putting significant price pressure on the major UK food retailers. In the stakeholder's view, the retailers would pass this pressure to processors and ultimately to producers (Southern English dairy producer and processing cooperative director). This dynamic of retailers devaluing prices throughout the wider chain in the long-term, while shielding their aligned producers in the short-term, was echoed in the conclusions of the 2015-16 Farmgate prices UK parliamentary committee's report: *"We question assurance from the retail sector that there is no link between the price at which supermarkets sell to their customers and the price supermarkets pay to farmers. While farmers engaged in contractual arrangements with supermarkets, directly or otherwise, are guaranteed a price for their milk for specific periods, the chronic low price of milk sold through supermarkets inevitably disadvantages farmers in the longer term. Supermarkets may choose to sell milk cheaply as a loss leader, but farmers must not be the victims of the supermarket wars currently taking place in the UK"* (House of Commons, 2016d pg.36).

Regarding non-aligned contracts, consultation with stakeholders showed the potential for great deal of variety in relationships, as this interview extract illustrates: *"It depends on how their buyer operates really, and how the buyer communicates information with the farmers. That could be through farmer groups, could be one on one if they're smaller, or they might not have a relationship at all, it could just be a phone call or a letter saying the price is dropping next month, and that would be the extent"* (UK dairy farming organisation). However, this research has also shown that both private and cooperative processors can take a more collaborative approach with producers. Muller UK, for example, is attempting to enhance the potential for producer representation through the creation of farming forums in 2017.[20] Similarly, stakeholders described that just like retailers, processors can behave differently when they are operating in different contexts within the value chain. Processors as contracted suppliers in retail-aligned contracts have a different level of power as part of the *"three-legged stool"* with producers and retailers. However, outside of these arrangements, and perhaps to compensate against the disadvantages they can create for prices in the wider industry, processors have been shown to use their enhanced power as the end-buyer in ways that have led to accusations of unfair trading practices. It is possible therefore to conclude that the nature of contractual arrangements and pricing practices, and the actor behaviour associated with them, are a dynamic balance of more cooperative partnerships and transactional market-governed exchanges. This variability reflects the changing market conditions actors find themselves in, their role in value chain and the strategic brand and/or the ethical concerns of individual retailers and processors.

[20] https://www.muller.co.uk/farmers/farmer-representation/ (Date accessed: 23RD June 2019)

2.4.2 REGULATORY INTERVENTIONS

In 2010 the EU High Level group on Milk released a report making recommendations to improve the working of the European dairy value chain after price crises in 2009. In 2012, partly in response to the report's findings, Dairy UK, the leading British dairy processors organisation, and the UK National Farmers Union agreed a Voluntary Code of Best Practice on Contractual Relationships (VCOP).[21] The VCOP stipulated minimum standards for good contractual practice. It guaranteed that 1) all contracts would contain a clear and transparent pricing system 2) producers would have additional rights to terminate contracts 3) processors would have to give at least 30 days' notice of a cut to prices. The code also gave new mechanisms for farmers to negotiate price and notice periods, either individually with processors or in groups (Dairy UK/NFU, 2012).

A review of the voluntary code in 2014 by the Scottish parliament showed it was achieving positive results for those producers and processors who participated and called for it to be expanded to include retailers who wished to join (AHDB, 2014). By 2015, approximately 85% of dairy producers had signed up to it (House of Commons, 2015a) and the 2015 Dairy prices review said *"there is cautious agreement that it has been beneficial within its limits. None the less, concerns remain about how far it protects farmers, not least because the code does not directly affect farm gate milk prices"* (Ibid, pg.13). Different views on VCOP were expressed during stakeholder consultation. There was general agreement that it had led to improvements, but that its voluntary nature meant businesses engaged in the worst practices did not join, and those who did could 'cherry pick' which parts they applied and when. As one farming organisation (UK dairy farming organisation) pointed out, there was nothing to force processors to adhere and they could choose not to when it suited their interests e.g. in a price slump.

Further price crises throughout 2015 and 2016 seem to have persuaded UK public policymakers to move towards initiating regulation introducing mandatory terms for contracts, allowed for under the EU milk packages, between processors and producers. Although many stakeholders seemed to believe that self-regulation had not worked, there was little appetite for more formal regulation, which was described as potentially inflexible and likely to lead to lower prices overall. One interviewee described any potential regulation being akin to using *"a hammer to crack a nut"* (Southern English dairy producer and processing cooperative director). They added that if a processor is made to fix prices for the length of contract, they are likely to be overly cautious as they don't know how global market conditions will change and the extent of the risk they are taking. Another interviewee described the situation as such: *"Processors want a contract that can give security to farmers, but from the same perspective, if the world market takes a nose dive on commodity milk prices, they can't be too exposed that they will go bankrupt, so it's a balancing act"* (Dairy agricultural manager, high-end UK retailer). This view was repeated in Dairy UK's evidence to the Farmgate pricing inquiry: "*In the volatile market in which the industry operates, dairy processors, whether co-operatives or private, do not have the resources to protect their supplying farmers from price fluctuations. Each 1 pence per litre change in raw milk prices equates to £140m. The current profitability of the dairy processing sector in its entirety is now believed to be significantly less than this amount. Efforts by processors*

[21] The VCOP applied to England, Scotland, Wales with a separate code in Northern Ireland.

to shield farmers from price fluctuations would ***expose*** *the industry to the risk of bankruptcy"* (Dairy UK, 2015, pg. 7). It is not clear whether consensus on how to maintain the "balancing act" can be achieved with or without regulatory intervention. Currently government consultations on introducing dairy have been delayed, with the expectation they may not take place until after a Brexit deal has been negotiated (Farmers Weekly, 2019).

Finally, Producer Organisations**,** another key provision of the EU Milk packages have not had significant take up in the UK. While the British government offers advisory support for the formation of P.O.s, so far only one, *Dairy Crest Direct,* representing approximately 1000 farmers has been established in England and Wales (House of Commons, 2016d) and one, *The Milk Suppliers Association*, a farming cooperative of 131 farmers, in Scotland.[22] Stakeholders had mixed opinions about their utility in the value chain, one suggested they could provide a structure for an 'umbrella group' of interests protecting producers not in retail-aligned contracts (Northern English dairy producer and processing cooperative director), while another questioned how they could gain reasonably leverage against processors and retailers (Southern English dairy producer and processing cooperative director).

2.5 CONCLUSIONS

It's clear that perceptions of fairness differ between actors and reflect their individual positions in the value chain. This research has shown that there appears to be an unusual level of difficulty in ascribing pricing mechanisms for liquid milk that are accepted as fair by producers while also mitigating risk for processors on global markets.

These disputes underline the asymmetries of power relationships between actors. Stakeholder consultation has shown that even when those with a greater degree of power in the value chain seek to act more fairly, there can be latent concerns among those with less power about future behaviour/relations. This perception that the power is there, even if it is not exercised in turn affects decision making and how different actors understand their place in the chain. Stakeholders also voiced concerns, in differing ways, that current protections are not sufficient to guarantee against unfair trading practices in contractual arrangements and price setting. Both the Voluntary Code of Best Practice on Contractual Relationships (VCOP) and potential further regulation on mandatory contracts do not attempt to introduce fixed/minimal pricing structures. Rather, they are seeking to enhance trust and to improve actor behaviour in the marketplace.

Stakeholders agreed that fairness could be improved by increasing collaboration in the supply chain, especially at producer level, with more data sharing and audited price reporting suggested as means to achieve this. Although there was also broad agreement that market interventions don't seem to have worked, the likelihood of further state intervention brought mixed responses, with concerns about its flexibility and losing the advantages of open markets being voiced. In conclusion, the key

[22] http://www.msa.scot/ (Date accessed: 23rd June 2019)

questions that emerge centre on how, when milk is a commodity with little season variation in demand and low levels of asset specifity, can value be maintained and created for liquid market? Secondly, there are questions of where contractual practices and price instability, perceived to be unfair by many, is evidence of a systematic market failure in need of regulation or whether it is, as Dairy UK describe it: "*an inherent characteristic of properly functioning deregulated agricultural commodity markets"*(House of Commons, 2015b).

2.5.1 STAKEHOLDER INTERVIEW LIST

Table 2-0-2 STAKEHOLDER INTERVIEW LIST

Interviewee Identifier	**Date of interview**
Southern English dairy producer and processing cooperative director	26th February 2019
Northern English dairy producer and processing cooperative director	20th March 2019
Dairy agricultural manager, UK retailer	1st April 2019
Dairy agricultural manager, high-end UK retailer	9th April 2019
UK dairy farming organisation (two interviewees)	11th April 2019
UK dairy processing organisation	12th April 2019

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3. GOVERNANCE OF GERMAN DAIRY TO LIQUID MILK VALUE CHAIN

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3.1 SUMMARY

Milk production represents the most important branch of the German agricultural sector, whereby the dairy industry is the largest branch of the German food industry (BMEL, 2017). Several major trends are affecting the dairy industry in the last two decades:

- The number of dairy farms is decreasing while the production per farm is raising (increase in the number of dairy cows and milk yields);

- A rapid horizontal concentration of processing companies;

- The number of actors along the value chain has been significantly reduced through vertical integration;

- Contractual relations (contract duration) between raw milk producers and processors are becoming more dependent on the regional competitive conditions;

Overall, German dairy value chain could be described by two parallel existing value chain models, the captive model reflecting the relations between dairy cooperatives (i.e. lead firms) and raw milk producers (captive suppliers), and the modular value chain model where retailers are 'lead firms' and dairy cooperatives and private dairy processors are 'turn-key' suppliers.

3.2 GERMAN DAIRY SUPPLY CHAIN

The dairy industry is one of the most important sectors of the German food industry, generating around 10 billion Euro of production value (about 20% of the total agricultural production value in 2015) (Grau, 2018). Besides enormous importance for the domestic market, German dairy industry is one of the largest in the EU accounting for about 20% of the EU raw milk production and is in the top five countries in the world concerning milk production.

The structure of the German dairy supply chain is given in Figure 3-0-1, and further explained in the following sections.

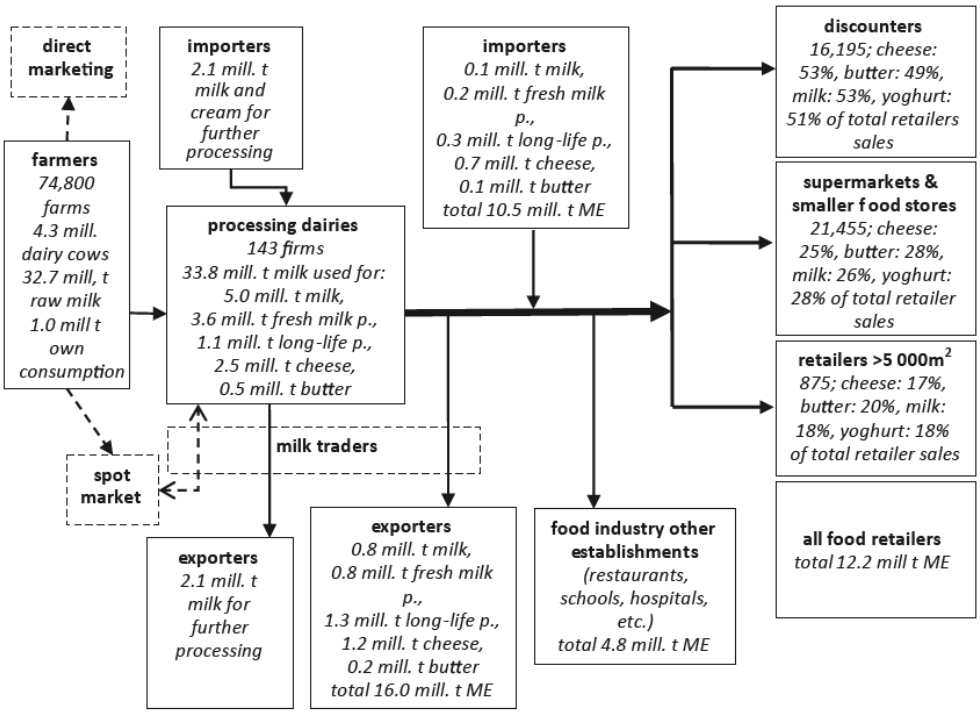

Figure 3-0-1 Structure of the German dairy supply chain (2014/2015) - Source: taken from Grau (2018).

3.2.1 MILK PRODUCTION (PRODUCERS)

Dairy farms are split between family-run farms mainly situated in North and South of Germany (former West Germany), and very large producer cooperatives[23] or private farms that are mainly present on East (former East Germany).

Almost all milk produced by German dairy farmers is delivered to dairies (i.e. about 96%). One of the main reasons is a contractual relation (i.e. delivery obligation of producers) between producers and dairy cooperatives and private dairies (Bundeskartellamt, 2012). Milk is usually collected by dairy representatives at the farm gate in a frequency of 1 to 3 days (Bundeskartellamt, 2009).

The raw milk production in Germany was heavily affected by the introduction of the EU milk quota system in 1984. Starting in 2000, the system of milk quota exchange was introduced to help small farmers to increase their milk production. Nevertheless, quota exchange was allowed only within the same region. The 21 regions in Germany were reduced to only two after 2007. Thus, reducing the number of regions by creating two large regions allowed quota exchange across larger distances (Grau, 2018).

Further significant changes happened after 2006 where the available national milk quota was increased on the annual level to help the dairy sector to adjust to the completely liberalised market in 2015. During the quota period, milk deliveries to dairies continuously increased. The number of dairy cows increased followed with large

[23] Farming cooperatives allow milk producers to bundle their supply in order to obtain better bargaining power. Creation of farming cooperatives was allowed by the Law on Market Structure imposed in 1969.

investments due to high milk prices. After the quota system, in 2015 and 2016, several dairy cows started to decline followed by a reduced amount of milk supplied to dairies. The quota system brought up a structural change in the German dairy sector where 47% of the West German and about 29% of the East German dairy farmers gave up the production of milk. From 135,600 dairy farmers in Germany in 2000, the number fell to 71,300 in 2016 (-47%). Nevertheless, the number of dairy cows per farmer continuously increased during the quota period from 33.7 in 2000 to 59.9 in 2016 (+78%). Furthermore, milk production per cow also increased during the observed period from 6,122 kg in 2000 to 7,746 kg in 2016 (+27%).

3.2.2 DAIRY INDUSTRY (PROCESSORS)

About 33 million t of milk was processed in German dairies in 2017 (Table 1). About 97 % of processed milk was obtained from domestic production, and about 3 % was imported in 2017. After processing, 37% (12.2 million t) was further used in food retail, 49% (16.2 million t) was exported, and 14% (4.6 million t) was used for further processing in other industries.

In 2017, there were about 153 milk processing companies annually processing about 204,323 t of milk (Table 3-0-1). Nevertheless, only about 20 companies were processing on average more than 300,000 t and accounted for about 75% of the total milk processing in Germany. Concerning liquid milk, 62 companies were involved in production whereby 13 companies processed about 100,000 t of milk per year (accounting for 84% of drinking milk production). Butter production was done in 63 factories where only five factories accounted for 54% of the total butter production in Germany. Milk powder was produced in 35 companies, where only six companies accounted for 54% of the total milk powder production. Finally, cheese was produced in 94 companies, where 27 companies accounted for 85% of the total cheese production.

Table 3-0-1 German dairy industry overview, 2010-2018

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Number of dairy cows (1,000)	4,182	4,190	4,190	4,268	4,296	4,285	4,218	4,199	4,150
Milk yields per cow (kg)	7,080	7,240	7,323	7,343	7,541	7,628	7,746	7,780	7,950
Milk production (1,000 t)	29,629	30,336	30,685	31,338	32,395	32,685	32,672	32,666	33,200
delivered to processors (%)	96.7	96.7	96.8	96.7	96.9	96.4	95.9	95.7	95.8
Drinking milk and fresh milk products (1,000 t)	5,423	5.377	5,297	5,208	5,283	5,198	5,182	4,932	4,800
from that H-Milk (%)	70	69	67	65	63	65	65	63	-
consumption (kg/head)	89.7	92.9	90.6	90.7	93.1	90.8	90.6	89.9	-
Butter (1,000 t)	450	474	490	482	490	517	515	497	490
consumption (kg/head)	5.7	6.0	6.1	5.8	5.7	6.1	6.1	5.9	5.7
Cheese (1,000 t)	2,354	2,376	2,419	2,440	2,469	2,495	2,498	2,481	2,500
consumption (kg/head)	23.3	23.7	23.7	23.7	24.1	24.6	25	24.1	24.2

Source: ZMB, BLE and BMEL.

Table 3-0-2 German dairy industry, 2010-2017

	2010	2011	2012	2013	2014	2015	2016	2017
Turnover (in billion Euro)	21,658	24,211	24,033	26,744	27,203	23,739	22,994	27,149
Turnover abroad (in billion Euro)	4,123	5,869	5,828	6,436	7,036	6,415	6,242	7,456
Number of companies	145	144	145	142	149	148	152	153
Number of employees	29,268	29,878	30,506	31102	33,887	35,163	36,335	37,099

Source: ZMB, BLE and BMEL.

Concentration in the German dairy sector becomes obvious in the last decade as large companies started with rapid acquisitions and mergers right after the milk crisis in 2009. As an example, according to the AGRARMÄRKTE Jahresheft (2017), two largest milk processing companies Nordmilch eG from Bremen and Humana Milchunion eG from Everswinkel merged in 2010 and formed the largest milk processing company in Germany called DMK Deutsches Milchkontor GmbH. On the other side, the Danish—Swedish company Arla Foods acquired Hansa Milch eG from Mecklenburg-Vorpommern, Allgäuland GmbH from Wangen, and Mich-Union Hocheifel from Pronsfeld in two years (2011-2012). With these acquisitions, Arla Food became the 2nd largest milk processor in Germany (processing about 2.5 million t of milk per year). Besides acquisitions on the domestic market, large German milk processing companies are active in increasing their share in the other markets as well. One of the examples is the Theo Müller Group that became one of the largest milk processors in England. This company also acquired several companies in the Czech Republic, Romania, Poland, and Israel.

When it comes to turnover from milk processing business, Table 3-0-3 indicates the top 10 companies in Germany in 2016.

Table 3-0-3 Top 10 milk processing companies in Germany (2016)

Ranking	Company	Place	Turnover (mio. Euro)
1	DMK Deutsches Milchkontor	Zeven	4,600
2	Müller	Aretsried/Freising	1,800
3	Hochwald Foods	Thalfang	1,440
4	Arla Foods	Pronsfeld/Upahl	1,400
5	FrislandCampina	Heilbronn	1,100
6	Bayernland	Nürnberg	1,000
7	Zott	Mertingen	902
8	Ehrmann	Oberschönegg	755
9	Fude + Serrahn	Hamburg	647
10	Molkerei Ammerland	Wiefelstede-Dringenburg	639

Source: MIV; Lebensmittelzeitung

As previously mentioned, there are significant regional differences in the structure of dairy companies in Germany. There are three main milk processing regions in Germany: South, North and East. The dairy industry in Southern Germany is characterized by a high number of processing companies and concentration of production. Bavaria is the Federal State where private companies and especially cheese producers are predominant. Some of the largest dairies in Germany that are export-oriented are based in Bavaria such as Zott, Müller, Meggle, Bauer, etc. (Fink-Keßler, 2015). In Eastern Germany, most of the dairy companies were closed after the German unification. There are only a small number of private and several large dairies that mainly belong to the West German companies. In Northern Germany, the number of dairies is not as high as in Southern Germany, and they are mainly independent of the Southern companies. There is a presence of both private diaries and cooperatives.

3.2.3 MARKETING CHANNELS (RETAILERS)

Retailers are the main marketing channel where dairy products are sold in Germany. The top five German retail groups account for more than 70 % of the market (Table 3-0-4), where discounters and supermarkets dominate food retail sale.

About 82% of dairy products are sold through the retail sector and only about 18% through other distribution channels. Most consumers make a purchase in discounter where almost half of the dairy products have been sold. According to Grau (2018), German consumer did not change their shopping habits in the last 10 years continuing to purchase dairy products at discounters and supermarkets.

Table 3-0-4 Top food retailers in Germany (2017)

Retailer name	Outlet type	Revenue (billion Euro)*	Number of stores
Edeka-Group			
- Edeka	Supermarkets	53.8	6,596
- Netto	Discounter		4,218
Schwarz-Group			
- Lidl	Discounter	37.8	3,219
- Kaufland	Hypermarkets		660
Rewe-Group			
- Rewe	Supermarkets	35.8	4,987
- Penny	Discounter		2,160
Aldi-Group			
- Aldi Süd	Discounter	28.3	1,890
- Aldi Nord	Discounter		2,250
Metro-Group			
- Real	Hypermarkets	26.3	282
- Metro	Cash & Carry		104

Note: *2016;
Source: Lebensmittelzeitung.

3.2.4 CONSUMPTION OF DAIRY PRODUCTS (CONSUMERS)

The per capita consumption of dairy products has faced a significant shift in the last decade. Up to 2015, about 30% of milk supplied to the processors was processed into **drinking milk**. It is interesting to observe that the production of low-fat milk was reduced from 56% in 2009 to 46% in 2016 despite the backdrop of trends in diet brought by wellness and fitness lifestyle of German consumers. About 52% of drinking milk was sold through retailers. Considering a short shelf-life of milk, it is common that this product is always marketed through special offers and discounts which make a great pressure on milk prices keeping them on a very low level, almost without any possibility for dairies to increase the price. There were only two major price increases in the last 20 years when dairies managed to increase the retail milk price substantially. Once in 2007 due to the Bovine Spongiform Encephalopathy (BSE) crisis, and the second time in 2007 due to the general food price picks. After 2007, market prices were fluctuating depending on the market conditions. The average annual per capita consumption of drinking milk is 51.5 kg.

Germany went from being a net importer of **butter** at the beginning of 90' to be self-sufficient in the last 20 years. Consumption of butter is stable with market prices almost at the intervention level. The average annual per capita consumption is 5.9 kg.

The main engine of the dairy market in Germany is **cheese** production that accounted for 44% of milk supplied to the processors, reaching production of 2.5 million t in 2015. As it is the case with drinking milk, 52% of cheese was sold through retailers. Average annual per capita consumption is 24.1 kg.

Domestic consumption of **skimmed milk powder** is highly price –elastic where self-sufficiency levels reach 150% up to 250%. Domestic production of **whey powder** has doubled in Germany for the last 20 years reaching 400,500 t in 2015. Concerning the **whole milk powder**, German production of total 256,300 t, in 2016, represent 31% of the total EU production. About 86% of the total German production was exported in 2016.

3.3 GOVERNANCE

In the last 30 years, German dairy sector went through tremendous changes. During 90', a typical value chain would account for five to six members. In the case of small milk producers, milk was firstly delivered to small local dairies. These local dairies would further transfer the milk to the central milk hubs. Then the central milk hub will deliver milk to wholesalers and only through wholesalers the milk will reach retailers. In a case of large milk producers, the central milk hubs did not play a role, and milk was directly transferred to wholesalers. The composition of the value chain was such that many small producers were facing several processors and even fewer wholesalers. The retailers had oligopolistic market power. Thus, the downstream actors of the value chain had increasing bargaining power.

In recent years, central milk hubs disappeared from the market. Their main functions, mainly marketing and sales, was taken over by processors who constantly increase in size. The same happened with wholesalers who were pushed by retailers that improved their logistic centres. Both processors and retailers increased their relative

power whereby producers, despite a decrease in number and increase in size, could not improve their bargaining power.

The bargaining mechanism was such that processors were passing the price pressure from retailers to producers. This was done through the processors' purchase price. It was estimated that 40 to 60% of the processors' cost arises from the milk purchase price. Thus, lowering down purchase price could improve the bargaining position of processors vis-a-vie retailers. On the other side, the milk price received by farmers was about 90% of the income of the specialised dairy farms. Thus, any reduction in milk price would have a significant impact on producers' income.

Concerning dairy cooperatives, relation between the milk producer and dairy (milk processor) is regulated through the supply contract that is fixed by the cooperative statutes and milk delivery order (dairy is obliged to purchase all milk produced by members of the dairy cooperative, and farmers are obliged to deliver their whole production to the dairy). It is important to stress that the farmers are formally the owners of the cooperative as they hold a share of the cooperative. If a new member wants to join the dairy cooperative, he has to purchase a share whose value is calculated according to the milk delivery volume. The average share cost is between 20,000 and 40,000 Euro. Once the member wants to leave the cooperative he will receive the invested money back. Usually, there is a long-term relationship between the producer and dairy (within dairy cooperative) and it is usually between 1 to 5 years. Within this period it is not common to terminate the contract. It is interesting to observe that dairy has several ways of improving its position vis a vis farmers. They can increase the switching costs (if the farmer wants to get out of the dairy cooperative before his contract expires), charging entrance fees, or not paying a volume bonus. Furthermore, if farmers leave their cooperative, it would be very difficult to get into the new one due to high entry costs. If they decide to come back to the old cooperative, they would probably get unfavourable conditions (or the second-class status according to Fink-Kessler (2015)) such as paying very high entry fee and probably would not receive a premium price on milk quality delivered to the cooperative.

The characteristics of the bargaining mechanism could be divided into three types. According to Klaus (2013), the operational strategies of the German dairies could be divided into:

- Niche players that are focused on specialisation and quality (e.g. production of organic milk);
- Large private dairies that have their brands. Their raw milk purchased price is a bit higher compared to large cooperatives (see Fahlbuch et al., 2013 for more details);
- Some of the dairy cooperatives grown through different mergers and acquisitions by becoming a part of a large processor. Thus, one large processor might own several dairy cooperatives. It is usual that the large processor is making dairy products that are marketed under trading brands of the food retailers. The raw milk purchase price of these cooperatives are very low. According to Fink-Kesser (2015) and Klaus (2013), these companies strive for cost leadership.

The highest level of concentration is recorded at the retail sector where five biggest retailer groups (Edeka, Schwarz, Rewe, Aldi, and Metro) account for about 60% of

sales in the entire food sector and about 70% in sales of fresh milk. Nevertheless, according to Fink-Kessler (2015), strong bargaining power of retailers is reinforced in a way that price negotiations for branded products take place once a year, and for commodities, the prices are negotiated at least twice a year.

3.3.1 CONTRACTUAL AGREEMENTS

The key components of the contractual agreements between producers and processors are (Fink-Kessler, 2015, pp. 15):

- Length of the contract
- Regulation of the milk volume
- Prices
- Obligations of supply and purchase
- Quality requirements

Abovementioned contractual agreements greatly defer between dairy cooperatives and private dairy companies (Bundeskartellamt, 2009) [24].

Milk producers' usually have a long-term contract with the dairy company (between one to five years). There are no price negotiations between producers and dairy cooperatives. Prices are usually set by the dairy by setting the farm-gate price at the end of the month based on the net margin of milk from the previous month corrected for the market conditions. That is the price paid next month. The producers receive their payments at the end of the reporting year. All producers receive the same price for delivered milk, and the final amount would depend on the overall performance of the cooperative. If there are shortfalls, farmers need to cover that.

Concerning private dairy companies, they can collect milk from independent producers, and they can have individual or collective contracts (with an average duration between 2 to 3 years) with milk producer associations[25] (in German MEG). According to the Law on Market Structure in Germany from 1969, milk producers were enabled to create producer cooperatives or producer organisations. Thus, producers were empowered to bundle their production and thus improve their position on the market. The Low on Market Structure was changed in 2013 allowing the same status for interbranch organisations as the producer organisations and associations had since 1969 (exemption from the antitrust rules).

There are three main pricing systems between private dairy companies and producers:

- Reference price system. The base for negotiating the purchase price of milk it the weighted average of the price paid by other processors in the region. This price is further corrected depending on market price increases or reductions.
- Differentiation of prices: producers with larger supply would get a better price.

[24] This section completely relies on the text written by Fink-Kessler (2015, pp. 15-16) and Bundeskartellamt (2009).

[25] According to the EU Commission (2014), there are 143 producer organizations in Germany and two associations of producer organizations (MEG). These two MEG are the Bavaria-MEG (South of Germany), and North-MEG (area around the Baltic Sea and North Sea).

- Fixed prices based on the contract. There is a system of fixing the price of milk for the first three months of the contract that is later renegotiated every quarter.

There are several trends recorded in the years after milk quota abolition. First, according to Schlecht et al. (2013), there is a trend among German milk producers to switch between dairies. The main way of surpassing the usual three-year contract is to split the farm and make two independent legal entities. This allows the newly formed farm to make a contract with another dairy. Second, there is a trend that less quantity restrictions are stated in contracts (Lehnert, 2009). Third, contract duration depends on the competitive conditions in the region. If there are not many milk producers in some region, usually contract with a dairy would be up to five years. On the other side, in the competitive regions, contracts would usually be only for one year. To mitigate the risk, some of the milk producer associations have contracts with several dairies at the same time.

3.3.2 VALUE CHAIN MODEL

According to the Global Value Chain Approach developed by Gereffi et al. (2005), the German dairy value chain can be presented with two models, captive and modular (Figure 1). The first model can be used to describe the relationship between dairy cooperatives and raw milk producers (members of the cooperatives). This is the captive model where cooperative represents the ‘lead firm’, and producers are ‘captive suppliers’. Thus, raw milk producers are highly dependent on one buyer, and the costs of switching from one cooperative to another are very high. On the other side, there is a parallel existence of the modular value chain model where retailers are ‘lead firms’ and dairy cooperatives and private dairy processors are ‘turn-key suppliers. Furthermore, this modular value chain model could be further extended to the relation between private dairy processors and independent raw milk producers where producers are turnkey suppliers of private dairy processors.

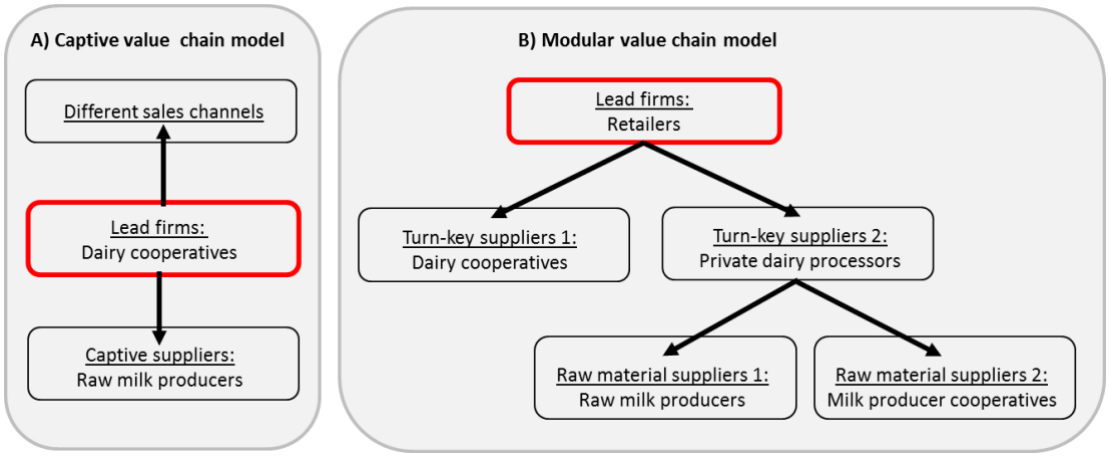

Figure 3-0-2 German dairy value chain models. Source: IAMO, 2019

Note: Arrows indicate codified informational flows rather than the direction of product through the value chain.

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4. GOVERNANCE OF FRENCH DAIRY TO LIQUID MILK VALUE CHAIN

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4.1 EXECUTIVE SUMMARY

The present case study on liquid milk value chain governance was led at the French level. The value chain is organised around four principle links: producers, collectors (either cooperatives or private industries), processors (specialised in different products mix) and retailers or out-of-home catering at the consumption level. Most of the time, collectors and processors are part of the same corporation, but a few organisations are specialised in milk collecting. Producers are globally in a situation of captive suppliers towards dairy industries or cooperatives, a link that is globally very concentrated, with two actors (Lactalis and Sodiaal) collecting and processing a bit more than half of the national milk production. The value chain is driven by two lead firms: dairy processors and retailers. Processors having difficulties promoting their own brand (and turning their products into indispensable products for retailers) have lower bargaining power with retailers and are under the pressure of retailers' own brands.

The governance situation of the liquid milk value chain can be described as "bipolar", meaning that it is both driven (meaning that some actors both impose standards and prices) by major dairy processors and by retailers. Dairy processors, depending on their ability to build inevitable brands and impose some standards, can either be in a relational linkage with retailers (meaning that "tacit information is exchanged between buyers *(retailers)* an suppliers *(dairy processors)* with unique or at least difficult-to-replicate capabilities *(or reputation)*") (Ponte & Sturgeon, 2014) or in a more captive situation, where retailers impose their norms and prices, sometimes for the production of their own retailers brands. Milk producers are in a very captive situation in most situations. The example of Biolait (described at the end of this document), a collecting tool dedicated to collect organic milk, strongly managed by farmers, and negotiating the volumes collected with different dairy processors, slightly escape to this captive logic though, giving more bargaining power to producers on a product that is less commodified than common milk.

The ability for processors to valorise their liquid milk – representing around 14% of the volumes collected at the national level - and the way they valorise it is strongly connected to their ability to valorise their overall products mix. Depending on the segment processors are specialised in and their ability to promote their brands, the processors will be more or less subject to international competition (potential importations substituting their products or difficulties to reach new export markets). The situation of strong competition on low quality cheese and butter at the European level for example, is leading to growing efforts of processors to valorise drinking milk production through different kind of segmentations. These segmentations can take the form of organic milk, pasture milk, GMO-free milk or ethical milk for example. The kind of segmentation the processors will be able to implement will be constrained by the

pool of producers they are historically working with their ability to change practices or production systems while reaching the production costs needed to keep or even increase their margins through milk production. The fact that most production systems are historically involved in intensive forms of production makes it difficult to valorise certain segmentation: conversion to organic production is not easy to achieve in some historically intensive areas, and specifications for pasture milks are generally not very restrictive, allowing to include the largest number of producers, but taking the risk of being relatively fragile as a label in return.

The milk value chain, and especially producers, have experimented difficult years in the recent period, both due to governance issues, milk regulation reforms (with the outing of quotas in 2015) and reinforced exposure to rapidly changing international markets. As we will see in this study, both segmentation dynamics and reinforcement of producer organisations at the local level did not fully address the value distribution issue in the drinking milk chain in particular, and in the dairy sector in general. If producers and processors implied in production with geographical indication, especially cheeses, have better resisted the quota outing, dairy producers involved in mass-consumption products (especially drinking milk, butter and cream) have experimented stronger economic difficulties during the last five years, leading to strong restructuring for some farms (Dervillé & Allaire, 2014).

4.2 INTRODUCTION: CONTEXT OF THE STUDY

The aim of this case study is to understand the drivers of the structural changes happening in the food value chain for liquid milk from dairy cows and the governance consequences they induced. Specificities of the milk market indeed influence governance organisation at all levels. The milk offer is continuous: because it is a perishable good, it has to be collected within 72h for conservation reasons. Supply cannot be quickly adjusted to demand: producers need mid and long-term visibility to justify important investments considering the low profitability level of milk production. Moreover, they strongly depend on meteorological factors.

Two central assumptions guided our analyses on the configuration of the governance of the milk value chain, as well as its current trends. On the one hand, as the domestic market has reached relative saturation concerning dairy products, the capacities (or difficulties) of the dairy actors to conquer export markets give us central elements for the analysis of the strategies of the milk value chains in general as for their domestic strategy in particular. On the other hand, the final form of the valorisation of milk production (the product mix) has a significant impact on both the governance of the milk chain and on the strategies developed by actors (both on the domestic and the international markets). As we will see, the approaches developed by cooperatives and by private dairies can be relatively distinct. For example, the former has an obligation to value the production of their members while the latter can provide themselves differently in the frame of their international strategy. This obligation of valorisation of production from members can also have an impact on the form of valorisation chosen by the processors : it will be easier to valorise fresh products if you can chose your suppliers (e.g.: what is done by Danone with ultra-fresh products) while you might be tempted to manage stocks and less perishable forms of milk (like dry milk or cheese) if the processor is obliged to valorise the growing production of its members (as it is

the case for many cooperatives). The ability to value national brands to maintain bargaining power with mass retailers can also be central in governance dynamics and in the ability to pay producers.

The milk sector is characterized by the fact that producers are highly captive, with dairies that are central in the decision process as well as mass-retailers, especially for the milk sold under their own retailer brand. While regional specificities remain, the national market is structurally unbalanced between producers (58 462 producers collected milk in 2016), retailers (4 main central purchasing groups are price maker on French market for consumer goods) and dairies, also knowing a concentration dynamic (Bazin et al., 2019).

Dairies that have deployed substantial means to promote their brands so that they are well identified (making it indispensable on the shelves of supermarkets) have a stronger bargaining capacity compared to dairies with less identified brands. In addition, all dairies, regardless of their product mix, must be able to value all the volumes they collect, knowing that certain dairy products are subject to greater competition from foreign productions than others, leading to heterogeneous difficulties of dairies depending on their initial product mix. This is particularly the case for low-quality cheese and for butter, in particular with buyers such as catering services or industries using dairy products, which show less concern on the origin of dairy products. This difficulty in valorising some milk volumes creates, in return, a form of tension on drinking milk, leading to reinforce the segmentation of a product which was relatively commodified so far, through pasture milk, GMO-free milk, ethical milk, etc. This segmentation has a twofold effect: giving the possibility to better valorise drinking milk (through a quest for added value) – even though the efforts needed to segment the production are not always paid back through additional valorisation - and to partly protect the domestic market from importation through differentiation.

As new common standards emerge regarding more sustainable milk production, sustainability standards serve to integrate the negotiation frame between stakeholders. Various definitions and uses of sustainability emerge in this process of segmentation, from strict environmental practices to broader meaning including social dimensions and the reshaping of governance modalities. In addition, the capacity of dairies to be able to ensure processes of segmentation, if this segmentation is based on the downstream specificities of production (farming systems), will depend both on the producer pool with which these dairies work as well as on their collective ability to change the practices of producers.

This will to restructure dairy model in order to create more added value has been expressed through the Strategic plan of the French milk sector “France Terre de lait” (“Plan de filière”) established during the EGA negotiations. It reaffirms the search for added value, through different upstream and downstream levers. Strategic transformation plans of dairies are oriented towards this objective as well, in order to enhance non-price competitiveness and to try to be less dependent from the milk world price, structurally fixed under production costs of French producers.

Most of the interviews led for this case study were led in Brittany, a region strongly involved in commodified milk production in France. Indeed, Brittany is specialised on commodities, producing low added value outputs of undifferentiated quality. This report is a national approach of the drinking milk value chain though, with some focuses on Brittany examples to illustrate some dynamics.

4.2.1 DAIRY MILK MARKET AND ITS EVOLUTION SINCE 1990

Demand on the European dairy milk market is facing stagnation since the 90's and even a decrease phase since the 2010's (Xerfi, 2018). Nevertheless, this trend does not impact equally the wide range of dairy milks sold. It is noticeable that demand for differentiated and segmented dairy milk is expanding. Organic milk collection was around 225 million litres in 2006 and climbed over 557 million litres in 2015, meaning an increase of 147% of organic milk collection in ten years (FAM, 2016). Many dairies are also involved in the "ethical" or "fair" milk markets (Basic, 2018), guaranteeing and coupling two main dimensions. Firstly, they integrate production costs in the farm-gate milk price to tackle the question of the allocation of added value. In a context of assumed "ethical transition" of consumers (Mével, 2010) and publicisation of low-income farmers as a political issue, the remuneration of farmers was placed into political agenda, as the organisation of the "Etats Généraux de l'Alimentation"[26] (EGA) in 2017 symbolised. Secondly, in a context of raising criticisms about the environmental impacts of the agricultural sector, most of the "ethical" dairy milk initiatives certify certain days of grazing for the cows, and/or GMO-free production[27]. These products are also often territorialised, connected to a specific area, although this area is heterogeneously defined[28].

Even though no important quantitative research has been produced on this topic, this segmentation strategy is developed by many dairies, selling dairy products through their own brand or selling it to retailers that use these "ethical" approaches to create new private labels of their own. The most emblematic one is "C'est qui le Patron ?" (Basic, 2018). In a context of liberalisation of the agricultural markets, segmented markets are quickly expanding. It is clear that the recent multiplication of segmented dairy milk products trying to couple social and environmental marketing arguments are designed for the purpose of creating added value. This massive search for added value into the dairy milk sector does not only relate to dairy milk but to the whole mix-product of dairies. Thus, dairy milk cannot be isolated from the other milk products.

Indeed, current dynamics within the dairy value chain and in the drinking milk chain in particular cannot be properly understood without taking into consideration two main factors: (i) the growing competition on both export market and on domestic market (especially on butter and low quality cheese, representing high volumes) ; (ii) the ability of processors to valorise different farming systems (based on pasture, territorial, GMO-free, etc.) based on both the pool of producers the collectors are working with and the final product mix the collectors are historically involved in.

The current context of "quest for value" in a context of tensed market and its various modalities are analysed below regarding the singularities of the Breton product mix and the singularities of different types of processors. On this latter dimension, it seems that the dichotomy between cooperative and private dairies is operative in numerous cases to qualify the different strategies.

[26] The law passed in November 2018, deriving from this national conference, is turned towards commercial relations in the agricultural sector and towards healthy and sustainable food.

[27] For example: https://www.lait-de-paturage.fr/

[28] The specific area is based on a regional attachment, geographical proximity, etc.

4.2.2 FOCUS ON LIQUID MILK MARKET

The figure below (see Figure 4-0-1) shows the share of drinking milk consumption in the total milk production, the share of imported and exported volumes, as well as the distribution of places of purchase/consumption between mass retailers, hard discount retailers, out-of-home catering or other places of purchase.

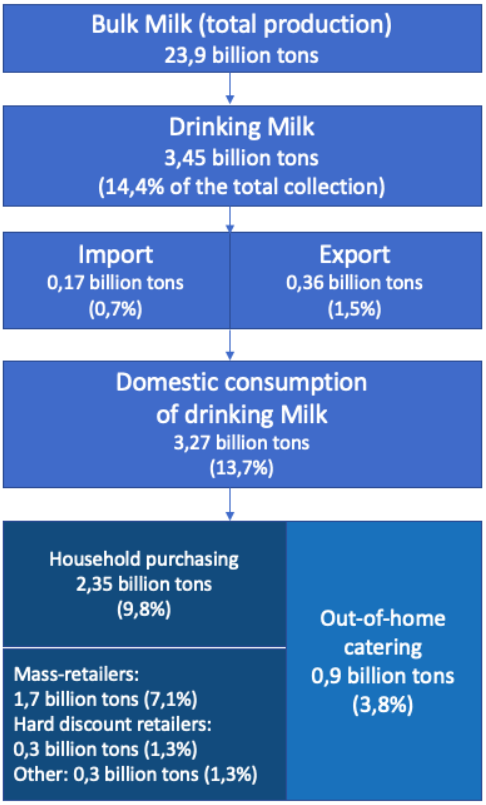

Figure 4-0-1 - Part of the drinking milk volumes in the overall production and share of the different forms of consumption

56 sites (out of 652 dairy industries in France) produce drinking milk and a quarter of these sites are limited to this single production. Half of the industrial sites that produce drinking milk also make at least two other types of dairy products, usually mass consumption products.

The general trend in France is the decrease in the consumption of drinking milk, especially since 2010 (see Figure 4-0-2 below).

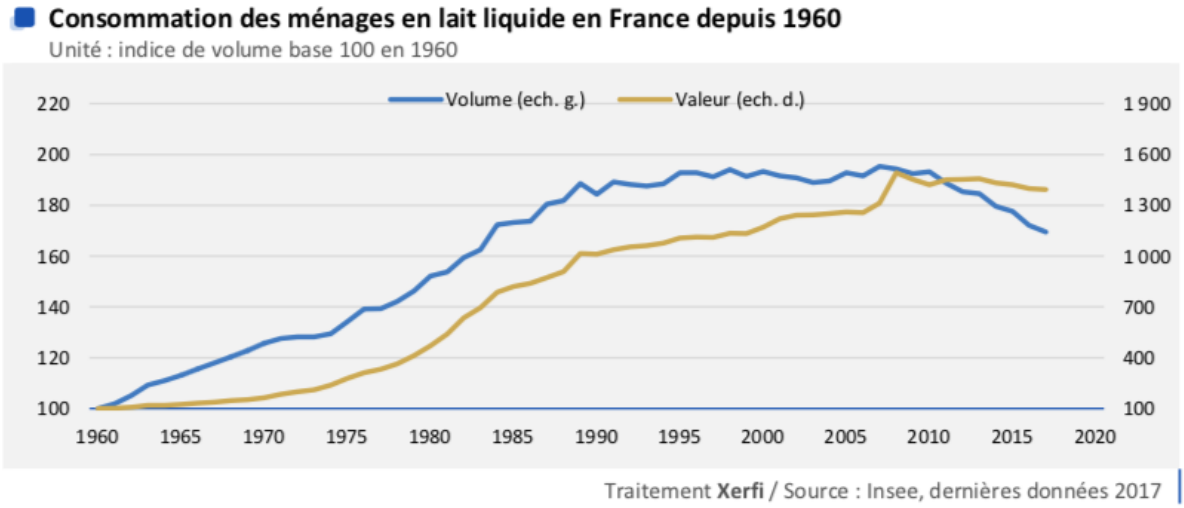

Figure 4-0-2 - Evolution of drinking milk consumption in France (in volumes and in value) (source: Xerfi 2018)

The volumes consumed include:

- UHT milks, which account for nearly 93% of the drinking milk volumes, including semi-skimmed UHT milk, which accounts for the majority of the volumes processed and consumed in France, but which is also one of the dairy products experiencing the most pronounced decline in terms of consumption;
- "specific" milks: flavoured milks, sterilised milks and pasteurised milks, which are on the upward trend, both in terms of production and consumption;
- infant milks, the volumes of which are still marginal (less than 3% of the total volumes of drinking milk in 2017)

Indeed, in a context of a structural drop in the demand for liquid milk (a segment which represents 3.8 billion euros, meaning nearly 20% of the total value of French dairy products), many companies have extended their offer to the most dynamic segments (organic milk, lactose-free milk, flavoured milk, etc.). The market of specific milks, which weighed 543 million euros in 2017, shows indeed a certain dynamism (Xerfi, 2018) and many dairy groups have accelerated their investments in this segment. This is particularly the case of Lactalis and Sodiaal, the two largest groups, which tend to strengthen their positions on organic milk. In parallel, the segment of "fair" milk (focusing on better remunerating farmers) is expanding rapidly. Launched in 2013, the FaireFrance brand has paved the way for this new segment of the market, and the annual production of fair milk is now estimated at 60 million liters, which is still a marginal volume though, compared to the whole liquid milk market (only 0.25% of the market) (Xerfi, 2018). Organic milk is becoming particularly important and represented 7.5% in 2017 of the drinking milk purchases, compared to the 2.8% it represented in 2008.

Exportation of dairy milk and dairy products in France represented 4 156 million euros in 2000 and more than 7 160 million euros in 2017 (Cniel, 2017). Stagnation of the national demand and dynamism of markets in third countries are two important factors explaining this exchange growth. For instance, Chinese market and its potentialities was depicted as an “Eldorado”. Exportation of infantile milk powder towards China was

multiplied by 5 between 2010 and 2017, going over 46 780 tons in 2017. In value, China is now the first non-European commercial partner of France, and the first one in terms of growth potential (Xerfi, 2018).

> *When we have a look at the prospective exercices and the analyses that can be done by people like Rabobank, who are foresight experts, they tell us that in 20 years the market for dairy products in Europe will be the same as today. There is no growth expected while on the rest of the planet there is future profitable growth to fetch and our job is to capture it. So we first prioritised Asia, and we are well established in the Middle East too, we are preparing for the future, not the growth of tomorrow but the growth of the day after tomorrow in Africa. Demography makes it explode, and our brands must therefore be present on the African market. To do so, we have set up a network of agents that shall bear fruit in the medium term. (Director of production in a cooperative)*

Simultaneously, international competition increases, held by the end of quotas. In France, exportation represents 10,63 billion tons of milk equivalent, representing around 42% of the national collection. In this context, world price level has increasing influence over the French farm-gate milk price. The farm-gate milk prices of the three main milk-production areas (Europe, New Zealand, the USA) have converged since the 2000s and an acceleration of this phenomenon is noticeable in 2006-2007. It has various consequences on price competitiveness in milk-production areas, depending on their features and ability to challenge the world market.

4.3 SHAPE OF THE DAIRY GOVERNANCE

4.3.1 GENERAL GOVERNANCE OF DAIRY VALUE CHAINS

4.3.1.1 General organisation

Discussions and restructuration over governance and value creation is happening in a context of “bilateral oligopoly” by growing concentration of major retailers (Trouvé and al., 2017) and growth and merging strategy of dairies. Both phenomena reinforce each other, price competitiveness fostered by retailers’ concentration leading to dairies concentration in return (Tozanli, 2001, quoted by BASIC, 2014). In this section, we will depict the current governance of drinking milk value chain in the current context by characterising the relationship between the different actors of the chain and the global governance of the chain. To do so, we will partly rely on Gereffi's analytical framework (Gereffi & al., 2005), stressing out the fact that stakeholders react differently to retailers’ concentration or to the increase of competition on national and international markets (Derville, Allaire, 2012).

If we globally characterize the different actors of the milk value chain, we can say that the retailers and processors are very concentrated, while farmers are of course more atomised. The perishable and not easily transportable nature of liquid milk turns milk producers into a form of captive situation towards dairies. A situation that has been strengthened in the recent period according to stakeholders. The processors are more or less driven by retailers, depending on the ability of processors to promote well-known brands, that the distributor cannot afford not to have on its shelves. Processors (either cooperatives or private dairies) with less recognised products may be more

enforced to produce for retailer brands (and are then subject to greater price pressure) to ensure the flow of their volumes.

This situation leads to describe the liquid milk value chain as “bipolar”, meaning that it is both driven (meaning that some actors both impose standards and prices) by major dairy processors and by retailers. Dairy processors, depending on their ability to build inevitable brands and impose some standards, can either be in a relational linkage with retailers (meaning that “tacit information is exchanged between buyers *(retailers)* an suppliers *(dairy processors)* with unique or at least difficult-to-replicate capabilities *(or reputation)*”) (Ponte & Sturgeon, 2014) or in a more captive situation, where retailers impose their norms and prices, sometimes for the production of their own retailers brands. Milk producers are in a very captive situation in most situations. The example of Biolait (described in section IV.2), a collecting tool dedicated to collect organic milk, strongly managed by farmers, and negotiating the volumes collected with different dairy processors, slightly escape to this captive logic though, giving more bargaining power to producers on a product that is less commodified than common milk.

These aspects lead to two potential governance situations, with either retailers driving the chain and imposing both their standards and prices on the downstream actors (especially concerning retailers’ brands), or with processors imposing their brands on the shelves with higher bargaining power towards retailers. Concerning processors: the forms of valorisation of milk that are distinct from drinking milk (cheese, butter, milk powder, etc.), both on export markets and on the domestic market, have an impact on the valorisation dynamics of drinking milk. Indeed, the transformation tools must valorise all volumes, and when a tension raises on one of the outlets, it can exert a pressure in return on the valorisation of drinking milk. The fact that imports tend to strongly compete with low-quality cheese and butter (especially in out-of-home catering or industries using dairy products) may partly justify recent forms of segmentation of liquid milk (pasture milk, GMO-free milk, ethical milk, etc.), aiming at strengthening the valorisation of a previously very undifferentiated product (with the exception of organic milk).

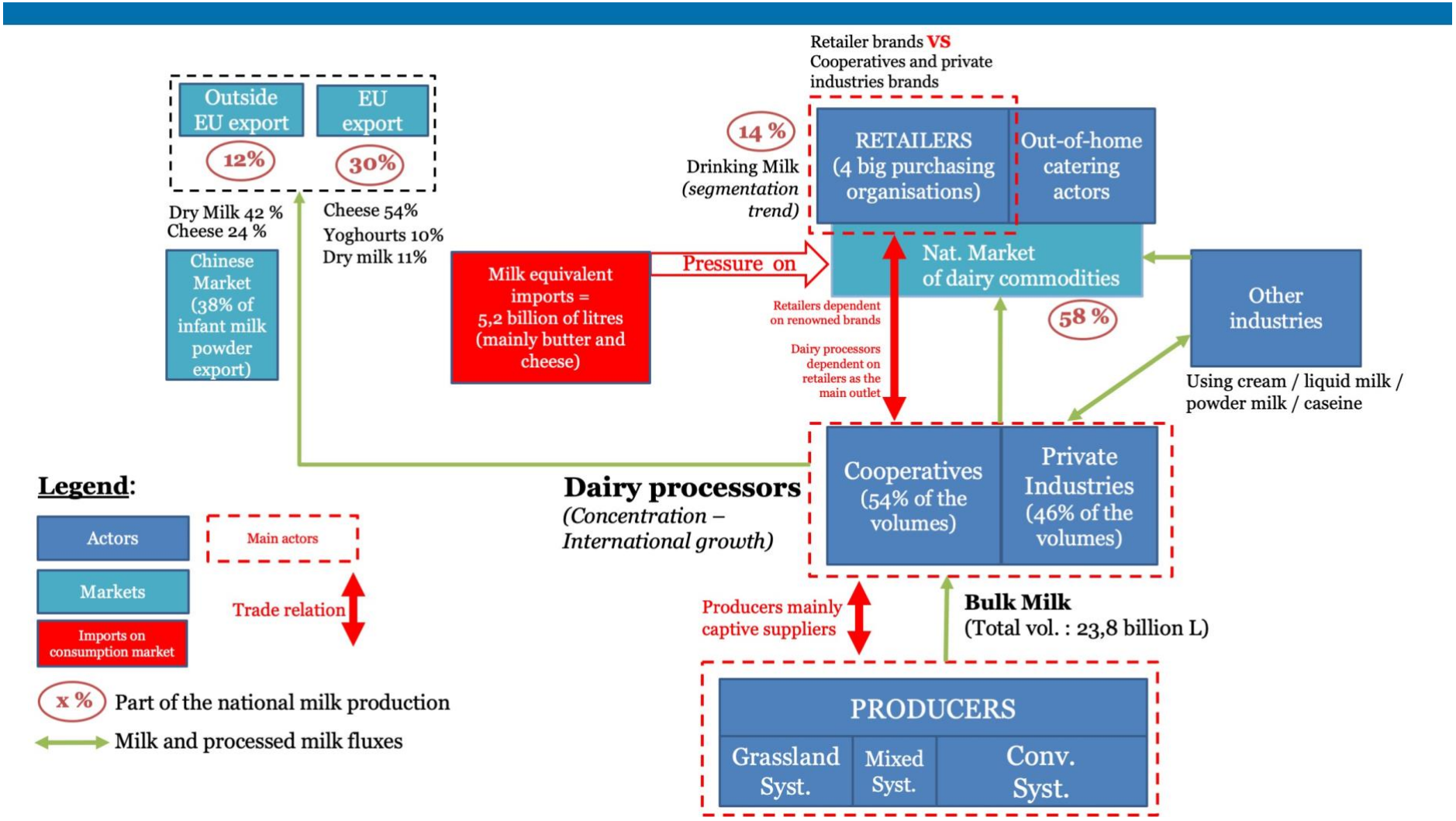

Figure 4-0-3 - Organisation of the milk value chain

Figure 4-0-3 gives a general overview of the liquid milk value chain governance, its dependence on different markets and the volumes concerned. Six litres of milk out of ten is valorized in the domestic market, and around 1,5 litres out of these ten consumed in the form of liquid milk, most of it being UHT half-skimmed milk. Producers are mainly captive to the private dairy industry or the cooperative that is located near their farm and have difficulties negotiating their prices (see section III.1 and III.2) while processors produce for retailers, out-of-home catering actors, industries using dairy products and export markets, under different proportions and with different forms of milk valorisation depending on their product mix. Concerning drinking milk in particular, more than 60% is purchased in hypermarkets, supermarkets or hard discount retailers, giving a central role to retailers in the whole liquid milk value chain governance.

Import markets only marginally affect liquid milk, but the pressure they exert on butter and low-quality cheese can generate a form of tension on the valorisation of milk in general, and on drinking milk (market quite stable in volume) in particular.

4.3.1.2 Relation between producers and processors

Around 24 billion litres of milk are produced every year by more than 58 000producers, transformed by cooperatives and private industries into cheese, liquid milk, ultra-fresh products, cream, butter, condensed milk and other products for the mass-market (75% of the production) and sold in the form of bulk milk, bulk cream, bulk condensed milk, milk powder and lactoserum to the agro-industry (25% of the production).

If the French national milk collection did not explode as much as in other countries in Europe after the end of quotas, we can still notice a “double intensification of the production” (Aubert, Tayeb Chérif and al., 2018) in Brittany, which induced the increase of the herd size in this region: fodder and/or silage maize replaced pasture, and cows that are more productive are selected. A polarisation of the strategies is visible in the recent years: most of the farms are focusing on the optimisation of physical productivity of their production system (therefore focusing on volumes produced) while a smaller share of farms rather focus on the optimisation of economic productivity by lowering the expenses (through grassland use for example), allowing to assume the lower volumes produced. In some other regions, the level of production has decreased, meaning that the end of quotas somehow reinforced the specialisations of regions in milk production and the overall concentration of the sector.

The low bargaining power of producers and the captive nature of their commercial situation is described here by an employee of an agricultural union:

> *The private dairies usually propose higher prices, so the distinction between private dairies and cooperatives is important. [Cooperatives] have an obligation to collect so they ensure milk collecting in areas where the private dairies do not want to go, implying significant production costs and justifying lower purchase prices. For Lactalis and for Danone (both private dairies), this aspect ensures part of their profit. (...) Collectively, members have no power in the coop. We should not think that members support the way the value chain is structured (...). In fact you are captive of your cooperative, you do not have much choice. (...) Since 2008 you cannot change collector anymore. There are tacit agreements between milk collectors that lead to the fact that you cannot change anymore (...) It's perfectly illegal. (...) There is no negotiation between producers and processors. In fact there is no market, no negotiation. The price of milk is set with indicators that vary monthly and there has been no negotiation around these indicators and price formulas. There were just some discussions at the CNIEL [the inter-branch organisation] about which*

> *indicators are valid. (...) Since 2008, you cannot leave your collector, they have locked everything. There is no market, no negotiation. (...) We usually talk about a market and about negotiations, but in fact they do not exist. (Staff member of a farmers union)*

French dairy landscape is characterized by the importance of two main actors: Lactalis - private dairy - collecting 5,3 billion litres and Sodiaal - a cooperative - collecting 4,7 billion litres, each of them therefore collecting around 20% of the national collection. As the dairy industry in general, liquid milk production is highly concentrated into the hands of a few corporations: the top ten organisations involved in drinking milk production produce 94% of the whole production of drinking milk, produced on 27 sites (44% of the number of industrial sites involved in drinking milk production). The fluxes of import and export are low, and the final consumption represents a bit more than 3 billion litres, mainly purchased in retailers' networks. A significative part (0,9 billion litres) is consumed in out-of-home catering though.

4.3.1.3 Relation between processors and retailers

The increasing influence of retailers on the entire dairy chain, in particular with the development of retailer brands, is progressively involving institutional transformations, with the gradual entry of retailers into the discussions of the inter-branch organisation for example, which was limited so far to producers and processors:

> *For a while we did not want retailers to arbitrate on price and volumes aspects as we [the processors] were in direct co-management with the producers. Now, considering what we're going through, since we've had monthly meetings with the retailers, it's fine for us to see that retailers participate to these meetings, because they're even more perfidious than we are. (...) So we are ready to receive them, no problem, and then to build partnerships like that, as it is better to know that they have the same indicators as us. So yes, we made a big shift. Here again it's the same, from the moment - even if cooperatives might say something else - big private groups have their strategies elsewhere and are building their dairy sector in China, Australia, Canada, etc., France is becoming an important playground where we all have interests in securing it and being with retailers. France is no longer an issue of competition, but rather a survival issue. That's why we had this shift in our strategy. (Representative of the National Federation of Private Dairies)*

On the other hand, supermarkets and hypermarkets are quite dependant on some processors' brands though, and this dynamic is not decreasing with growing consumers expectations about transparency on milk origin. Importations mainly concern specific products, such as Italian cheese, or butter and low quality cheese, two types of product for which price competitiveness is at the core of home-catering and non-dairy agrifood industry purchasing policies. For instance, in 2015, only 40% of the milk volume used by non-dairy agrifood industry was produced in France, all the rest was imported, increasing tension on processors concerning domestic valorisation. Some domestic markets are therefore closely related to world milk price and do not depend on specific conditions negotiated between stakeholders for consumer goods. (Perrot, Chatellier and al., 2017).

4.3.1.4 Value distribution along the liquid milk chain

Following figure (Figure 4-*0-4*), illustrates the evolution of the gross margin between 2001 and 2016 in the different links of the value chain. It has stayed rather stable at the producers' level while it has increased by 50% at the processors' level and has doubled at the retailers' level.

This phenomenon does not describe all the milk value chains but gives an illustration of the recent unbalanced changes in the value distribution along the chain. These rapid changes cannot only be explained by the concentration of downstream actors of the chain, as these actors were already very concentrated in 2001, but concentration could be part of the explanation. The quota outing in 2015 could also be an explanation to the significative raise of disparities between 2015 and 2016, to the disadvantage of producers.

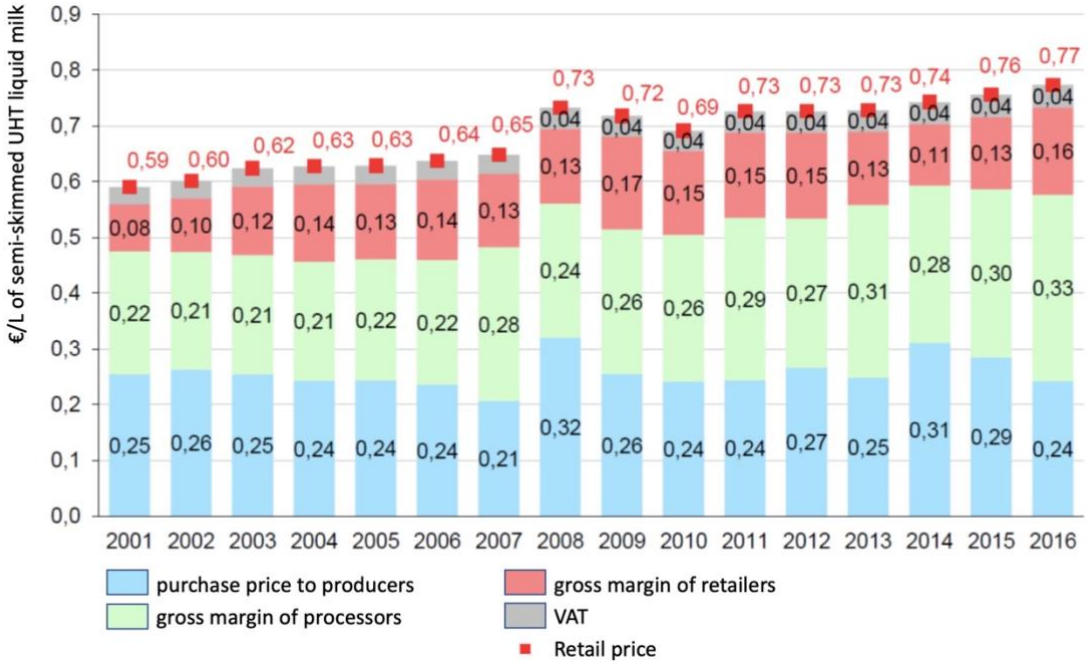

Figure 4-0-4 - Evolution of the distribution of the gross margin in the different links of the liquid milk value chain

Since the end of quotas in 2015, the repartition of the value between the various stakeholders of the milk chain has been a strong point of conflict. Following the 2009 dairy crisis and the drop of farm-gate milk price, various protests have been led by farmer organizations. In a period of dairy market instability (Trouvé and al., 2017), the issues of fair milk-gate price and allocation of the added value created are constantly brought to the core of the debate.

The dairy milk sector has known many reorganisations, reshaping the chain. These structural dynamics did not start in 2015 with the quota outings. They are the outcome of long-term internationalisation strategies, concentration among players, deregulation and liberalisation of the CAP (Common Agricultural Policies). For a long time, the CAP has contributed to minimize the farmers' risk-taking through costly price support policies. It has been recently transformed into a liberal policy accompanied by safety net measures (Tayeb Cherif, 2016).

4.3.2 DIFFERENTIATED STRATEGIES BETWEEN COOPERATIVES AND PRIVATE DAIRIES AND SEGMENTATION DYNAMICS

On the one hand, domestic market is seen as a stability perspective and a key-target for dairies to move-away from the world price dependency. On the other hand, most of dairies' growth increase are related to their ability to conquer new export markets or to develop foreign subsidiaries (either ex nihilo or through buyouts). National market is qualified as mature but is experiencing strong segmentation. Segmentation strategies

can be downstream: they are part of a brand portfolio and centred on a marketing and product innovation strategies. Some others focus on production systems and are rather upstream segmentation strategies: growth of organic collection, of Protected Denomination of Origin (PDO), development of grazing system or GMO-free milk, etc.

Segmentation strategies to improve added value of dairies is strongly related to strategic orientations they have defined, materialized through their product mix. They can be upstream or downstream, they can focus on specific market opportunities (local, national, European, international), etc. Paths of internationalisation followed by dairies also shape orientations of these strategies, and the way internationalisation growth is led is a dimension that is highly structured by the duality cooperative/private dairies. For example, private processors like Danone would rather establish new industries in foreign countries that are supplied by local producers to produce the dairy products Danone is specialised in, while French cooperatives would rather valorise the production of their members by conquering new export market shares. Export rates of French cooperatives and their subsidiaries therefore increased from 15,5% of their global turnover in 2005 to 22,4% in 2016. (Xerfi, 2018). French cooperatives are more inclined to develop exportation from their collection and transformation historical areas. Indeed, cooperatives have to respect a constraint of territoriality, restraining the membership to a specific geographic area (Filippi, 2013). Thus, preference is given to milk powder, especially infantile, and cheese for exportation: fresh dairy products are hard to transport and cooperatives suffer from a competitiveness deficit compared to local productions for standard products, while private dairies are more inclined to develop in-situ strategies in targeted countries that can consist in processing fresh or ultra-fresh products.

4.3.3 INDUSTRIAL STRATEGIES SHAPED BY HETEROGENEITY

4.3.3.1 Major private dairies: dualisation of development strategies

World top leader private dairies are present on the market and do have collection and transformation activities in France, such as Lactalis, Danone, or Bel. Volume collection is significantly different from a case to another. For instance, Lactalis collects 5,3 billion litres in France whereas Danone collects around 1 billion litres[29]. Dynamism of the milk collection is also diverse, but none of the previously named dairies develops a strategy based on volume collection growth.

Private dairies can adjust industrial strategies to the market. It seems that private dairies attempt to find a balance between dynamics of the national markets and milk collection for many consumer goods, such as fresh dairy products (yoghurt, etc). They wish to reduce logistic costs of transportation and have the ambition to conquest new promising markets by developing new collection and production activities in targeted countries. In a context of mature markets in Europe, economic dynamism of these companies is located abroad. For instance, Lactalis currently generates 80% of its turnover abroad, and has more than 5% of market share on the 5 continents. In the same logic, Danone has decided to reduce the volumes collected with some of its producer organisations (PO) in exchange of the integration of new modalities in the price formula that we will explain in section III. Danone focuses mainly on fresh dairy products in France, limiting the issue of co-product valorisation, as fresh dairy products valorise all the components contained in milk. The fact that private dairies like Danone

[29] Some other experts interviewed talk about 600 million litre collected by Danone in France.

rely on well distinguished brands also has an impact on the milk valorisation and the ability of Danone to limit the influence of retailers on its strategies:

> *Danone has always fostered its business model and its growth on the development of its own brands, which requires a lot of investment but which actually allows a form of counterweight to retailers thanks to brands that are requested by consumers and well known, and allows not to have an intermediary. It has never been Danone's strategy to want to be much more connected to the retailer by making brands that are not recognized by the consumer. If we make the other choice, it means that we do not do marketing investment because the retailers do it for us and we have tools dedicated to it but it's hard to have both strategies. It is difficult to have strong marketing investments and to be strongly bound to retailer brands at the same time. Some actors like Senoble have chosen to engage in retailer brands, which can be a completely justified choice, allowing growth etc. but which relies on another business model, meaning very low investments in advertising, and amortising the costs to the maximum on the factory, with prices under bigger pressure. (Sustainable Development Manager at Danone)*

The lower commitment of big private dairies in retailer private label productions let them benefit from an important power of balance during commercial negotiations with retailers. Important marketing strategies participate to create emblematic own brand dairy products, capturing added value downstream. Through the reinforcement of brand portfolio, companies wish to increase their sell and to improve their power of balance during negotiations. As explained by a production manager in a private dairy, the question of volumes collected in order to fit the markets that proposes the best valorisation for milk production is a crucial issue:

> *What they do not understand is that they [the producers] want to produce more volume, but the most important thing is the price of milk. If we have to collect x or y extra milk litres to degrade our product mix and pay less for milk, I do not see where their interest is. That is what happened to some of our colleagues around, proposing to their producers to produce millions of litres without knowing what they wanted to do with it, we saw what happened... (Production Manager in a private dairy)*

4.3.3.2 Dairies specialized in differentiated milk and dairy products

In a context of explosion of organic milk demand and search for confidence in products (Lamine and Chiffoleau, 2012), the segmentation based on those dimensions – which are not only built as a response to low remuneration, but also seen as a territorial and a long-term project – offer attractive farm-gate milk price for producers. For many of these actors, the engagement in differentiated milk collection and transformation is based on a long-term perspective and is not seen as a simple market opportunity.

Biolait for example, a private collector specialised in organic milk, develops a global long-term approach. The organisation wants to structure and extend the collection of organic milk in France (Bocquet, 2010). It only collects and does not transform: they are only specialised in milk collection and increased its milk collection of 40% between 2017 and 2018. To prevent strong dependency to one processor, Biolait decided not to contract more than 20% of the volumes with a single dairy processor, and currently works with more than 100 processors.

As an historical actor of the organic milk collection, which decided to be engaged on this segment before important dairies, Biolait built a strong legitimacy in this dynamic sector. However, the strong development of organic market induces strong competition among different actors. To secure and diversify their activities, Biolait explores some of the different patterns of segmentation evocated in the previous typologies. From

contracts mainly focused on dairy milk, they develop their range of transformations. Organic cheese, the development of which has been historically limited by the importance of PDO cheese, is for instance an important growth opportunity for Biolait.

4.4 THE DRIVERS OF ADDED-VALUE DISTRIBUTION

4.4.1 MODALITIES OF PRICE NEGOTIATION

The segmentation patterns and the promotion of well-identified brands on the market participate to strengthen the creation of added value promoted by private dairies but does not necessarily address the value sharing and farm gate milk-price issues.

Modalities of price-fixation have recently changed. The inter-branch agreement established in 1997 attributes a central role to the CNIEL (Centre National Interprofessionnel de l'Economie laitière, gathering three colleges in its governance: producers, dairy cooperatives and private dairies) to fix the milk price. From this moment, they endorse a moderating role to reach agreement. The price-fixation system was organised by the CNIEL, the CRIEL (Centre Régional de l'Economie Laitière) and dairies. CNIEL used to transmit price indicators to CRIEL, which were in charge of seasonality and quality-based payment (Trouvé and al., 2017). Indicators were shaped to guarantee a form of price stability and not to erode the competitiveness of the French dairy sector. In this frame, the role of the dairies was very weak: it was reduced to premium milk payments with producers.

In 2008, the French Competition Authority, DGCCRF[30], denounced these practices as anti-competitive behaviours. Indicators suggested by the inter-branch are now given on an indicative basis. Considering the individualisation of contract negotiations induced by this decision, the crisis context in 2009 and the planning of the end of quotas in 2015, a new negotiation frame based on contracts between dairies and producers and the gathering in producer organisation (PO) have been encouraged. The movement has started since 2010 in France and was formalised at the European level in 2012 through the adoption of the "Milk Package". Roles of the CNIEL (dairy inter-branch former role to negotiate and define milk price and quality is put into question) and the administration (in charge of volume allocation) were re-defined (Lambaré, Dervillé, You, 2017)

As some analysis develop, differences in contract formalisation cannot be understood only through the duality cooperatives/private dairies (Lambaré, Dervillé, You, 2017). Both of them have to negotiate with local and national producer organisations. Many important cooperatives are facing a legitimacy crisis. In a context of complication of governance structure linked to internationalisation, producers have less decision-making power. This phenomenon is reinforced by valorisation strategies, oriented towards high R&D and industrial restructuration investments (Filippi, 2013).

[30] Direction Générale de la concurrence et de la consommation de la République française (French General Directorate for Competition Policy, Consumer Affairs and Fraud Control)

Table 4-0-1 - Coordination modalities on volumes, quality, prices and regulation in the dairy value chain. Translation of Dervile & al., (2016).

Coordination modalities	Before 2012	After 2012
Volume	Production quota for each producer	Really constrained in most cases
Quality	Interbranch quality-based milk payment	Interbranch quality-based milk payment + primes of companies
Modalities of price fixation	Interbranch indicators	Negotiations between dairies/PO based on interbranch indicators
Real milk gate price	Interbranch prices, including market positioning of the company	Alignment of competitors for big companies small dairies: more important prices
Regulation modalities	Co-management and interbranch negotiations	Cooperatives or OP/dairies Mediation, union labours

Farm-gate milk prices depend on the outlets dairies open to their producers. "Price-formula" defined by each dairy appears as a "complex alchemy" (Idele, 2016) between product mix, performance of plants and industrial tools, commercial positions on markets and willingness to share added value. The final farm-gate milk price is then the result between the milk-quality basement[31] and the price paid by the dairy. It depends as well on volume policies stipulated in contracts: dairies have diverse opinions about volume regulation, from an absence of definition, to strong regulations. Regulations appear as double price-volume system[32], mainly for cooperatives or penalties.

4.4.2 ARE PO EFFECTIVE TO BALANCE THE NEGOTIATIONS?

Based on the elements previously cited concerning farm gate milk prices, competitiveness appears as a priority. This new context puts into question the role of PO and their modes of organisation, willing to balance the negotiations.

PO have been set up to prevent unbalanced negotiations in the dairy sector following the transformation of the CAP system. They constitute new tools to compensate the end of market management mechanisms[33]. They have in charge the contract negotiation with the dairies.

The PO negotiate framework contract to prevent unequal power of balance between individual producers and dairies. This framework-contract are mandatory. Legal frames, through revisions, progressively give a central role to the PO[34] in these negotiations. Two different types of PO exist. Non-commercial PO is the most common one. They own a mandate to negotiate their price/volume trading conditions. In the case of commercial PO, the PO is the owner of the milk delivered by producer members and is in charge of selling it to dairies. Moreover, a PO can be vertical – in

[31] This basement is based on quality indicators (germs, cells, butyric, lipolysis, inhibitors, cryogenics) and composition (fat, protein rates).

[32] The double-price system guarantee « price A » for a certain volume of milk, and « price B » when the « price A » volume has been exceeded. They often follow indicators such as valorisation on national market for price A, and milk powder world price for « price B ».

[33] In case of litigations, the legislator set up a contract mediator, in charge of conflict regulation.

[34] To learn more about legal evolution : Idele, (2016). Les contrats laitiers : États des lieux en 2016, Dossier Economie de l'élevage, n°474.

one dairy – or horizontal – gathering producers delivering to different dairies. PO can gather in association of PO (APO) in a vertical – meaning in one dairy – or a horizontal way – gathering different PO of a defined territory.

Majority of PO are linked to one dairy and emerge in the frame of this dairy. However, we notice a transformation in the perception of their role. From a position of price-negotiator, many of them are now asking to play a role on volume management (CGAAER, 2015).

However, the success of PO organisation is limited. Numerous producers are still not member of a PO. Their functions remain unclear and shady for many producers, which could explain the low membership rate of some PO. The first structuration of PO, in 2010, rather encouraged structuration at the basin dairy collection level, than organisation at a more global level, through horizontal PO, which could have fostered exchanges between dairies and transparency in the farm-gate milk price definition.

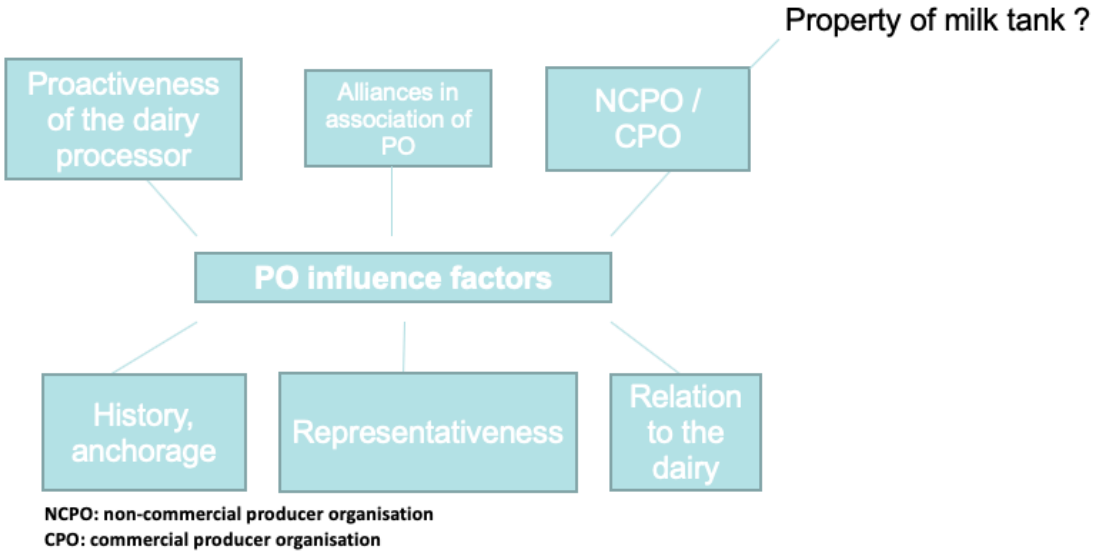

Figure 4-0-5 - The different factors influencing the capacity of bargaining of the producer organisations

Different factors influence the real impact of PO. Firstly, PO struggle to be as representative as possible, to have a stronger bargaining position in the negotiations. The ability to gather producers and representativeness depends on many factors, such as its historical anchorage, its proximity to ancient local association web or trade union movements (many PO are closed to local FDSEA sections, the main farmers union). Representativeness does not however mean a better value sharing in a context of structural imbalance between the stakeholders of the chain. The information asymmetry about reality of product mix, of transformations, of volumes bought to other companies[35] in some dairies raised during our interviews are strong issues concerning value sharing.

In Brittany, levers to pressure dairies are few. During our interviews, we met a PO representative aiming to transform its NCPO into a CPO, to be able to sell production to various dairies and to benefit from a better market access. This approach however faces limits. Structuration into CPO is more common for differentiated milk (mainly

[35] Dairies are commonly specialized in some specific milk transformations and adjust their needs by buying milk and milk products to each other.

organic) or in “shrinking” agricultural areas. Undifferentiated milk represents less than 3% of the collect by CPO (Idele, 2016).

Effectiveness of bargaining between a PO and a dairy depends on specificities of territorial market structure too: a dairy rooted in an area where milk production strongly decreases has less favourable bargaining conditions.

The characteristics of the product mix of the dairy is another key element and puts into question the relationship between best-practices in terms of negotiations (leading to concrete agreement) and social weight of PO. Bel and Danone appear for instance as “model pupils” of the producers remuneration. Both of these companies are marked by importance of consumer goods in their product mix, and high level of profitability. Danone decided to integrate costs of production in exchange of a strong decrease of its volume collection. This unique agreement relied on the “dairy atmosphere” (Chatellier, Pflimlin, 2007) as well. Demands for milk for neighbouring dairies have facilitated the negotiations with producers: in case of disagreement about volume collection, Danone has encouraged the change of dairies[36]. Moreover, these good-practices examples integrate important share of production costs formulas in farm-gate milk price negotiations: this important share given to production costs is facilitated by the sales of high added-value product orientations, not necessarily correlated to value sharing commitment.

Dominant position of a PO can facilitate negotiations about young farmer allowances or distribution of volumes (after cessation of milk production for instance), but have limited decision power about price fixation mainly driven by product mix and state of the competition. If PO strategies are heterogeneous (Lambaré, doc Idele), predominance of intra-firms negotiation participates to erase political dimension of price fixation.

By encouraging information sharing and surpassing intra-firm management logic, associations of producer organisations (APO) could appear as a way to structure collective action at different scales (Trouvé and al., 2016). For some analysts, APO could have a key role of crisis prevention by endorsing a role of volume management (Courleux, 2016). However, while initiatives intend to structure PO at the regional or national scale, the influence of APO remain symbolical.

4.4.3 WHO IS RESPONSIBLE FOR THE VALUE SHARING? RETAILERS, CONSUMERS AND POLICY MAKERS

4.4.3.1 Retailers

Relations with retailers are key aspects of the price formula definition. Indeed, around 42% of the volume of milk produced in France is sold through supermarkets and hypermarkets (Perrot, Chatellier and al., 2017) through all types of dairy products. As explained previously, consumer goods, mainly sold through supermarkets and hypermarkets, are the backbones of many industrial strategies oriented towards value. Moreover, supermarkets and hypermarkets (contrary to out-of-home catering or industries using dairy products) are relatively bound to French products, due to an inclination towards national consumption for dairy products.

Trade negotiations are organised between dairies and retailers on an annual basis. Stakeholders discuss about price and volume modalities, formalised by commercial

[36] “La réduction des volumes en Basse-Normandie : l’OP dit “banco “à Danone”, Eleveur laitier, 15 février 2019.

contracts. Based on interviews of dairy managers, we can say that these are conflicting discussions. The swing from a push-flow system for consumer goods production, driven by production, to a pull-flow system, driven by demand, provides a central role to retailers in the value chain (Mevel, 2010). Dairies accuse retailers not to respect value sharing and to benefit from imbalance relationships.

Tripartite agreements have been mainly used since the end of quotas in 2015 (Idele 2016). A PO, a dairy and a retailer enter into a specific contract, integrating production costs[37]. These agreements are more favourable for producers because they confer transparency to the chain and integrate a negotiated price, generally situated over production costs. They constitute an important communication tools for retailers to capitalise over the "ethic consumption" trend. They concern however low volumes for the moment.

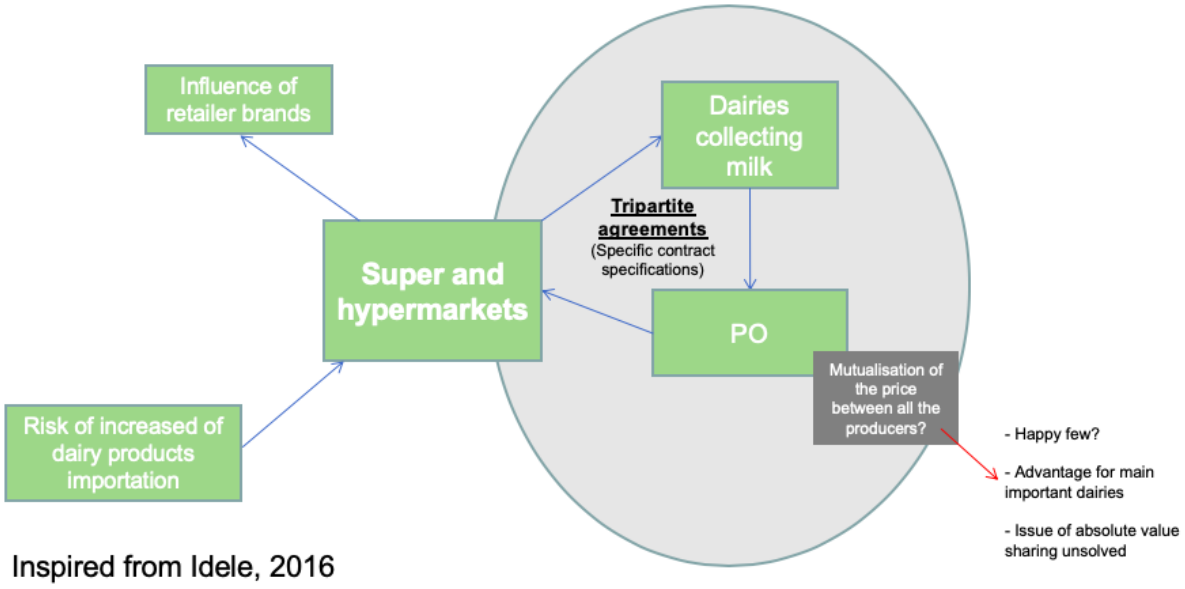

Figure 4-0-6 - Tripartite agreements scheme among producers, processors and retailers

In the frame of commercial negotiations between retailers and dairies, some dairies signed tariff agreements with retailers. These arrangements are held by major dairies which announced agreements on important volumes[38]. They seem to be more favourable for important private industries. Indeed, main retailers' brands are produced by cooperatives and SME[39]: Negotiations about retailers' private brands do not follow the same schedule and can be more arduous. Indeed, by developing retailer private labels, hypermarkets and supermarkets control production costs, integrate intermediaries and can benefit from higher gross margin. Dairies become partners and competitors for retailers, benefiting to the retailers during commercial negotiations (Hocquelet, 2016). Major private dairies are less concerned by retailer private labels. As previously explained, they have better brand portfolio for consumer goods: it influences their negotiation power with retailers, because the lack of emblematic brands in stores can affect retailers.

[37] This deal includes environmental uses, such certain number of grazing for herds.

[38] For instance, Lactalis signed a tariff agreement with Leclerc about the whole consumer goods production for Leclerc.

[39] As explained before, negotiations are rougher for private labels

4.4.3.2 Legal frame: a simple displacement of the negotiation conditions?

As many other modalities, public policies define relations with retailers and related obligations. The law “Agriculture et alimentation” relative to commercial relations in the agricultural sector towards healthy and sustainable food was passed in November, 2018. It appears to be a good example to analyse interests and limits of public policies to regulate dairy milk chain governance. This law is aiming at reducing the power imbalance of agricultural value chains in general and of the liquid milk value chain in particular but has not yet proven its efficiency among producers[40].

Historically driven by an administrative and territorial logic, the French milk context has been disturbed by the prevalence of international market. However, the implementation of new regulation tools intends to overbalance negative consequences of liberalisation for producers.

This legal frame confirms the obligation of integration of production costs indicators, already suggested by previous laws. It reverses the contractualisation construction, which used to start from a contract proposal formulated by a dairy processor to producers. The new frame gives a central role to producer organisations: the contractualisation process starts from the PO, which are in charge of proposing a contract based on cost of production to the dairy they are selling milk to. Then, these indicators have to appear in all the contracts signed following a “domino effect”, regardless of the outlet expected for the milk. These indicators should stream all over the chain, from upstream to downstream stakeholders, regardless of the various market features.

This ambition has strong operational limits. Indicators calculating cost of production are numerous and methods are different. The CNIEL, the milk interbranch, is in charge of formulating indicators of production costs which are only indicative, as some dairies decide to set up their own indicators.

Moreover, integration of production costs is feasible on captive markets, such as supermarkets and hypermarkets which are mainly dependant on French production. However, on competitive markets opened to international processors such as out-of-home catering and non-dairy agrifood industries, it seems hard to set up prices without generating an important price competitiveness loss. Production costs indicators remain in most cases a percentage of the price-formula stipulated in the contract. Other indicators, depending on commercial outlets and product mix are integrated into price-formula. If public policies encourage effectively more information transmissions between stakeholders, this legal revision does not erase phenomenon of alignment on national and international competitors, and opportunist definition of farm-gate milk price, based on less-competitive competitors. European and French regulation frame is focused on a search for transparency, which is driving tools set up for dairy milk policy and for regulation of farm gate milk price (Trouvé et al., 2016).

[40] See the following article: https://www.banquedesterritoires.fr/loi-egalim-peu-deffet-sur-les-prix-payes-aux-producteurs

4.4.4 PUBLIC POLICIES INFLUENCING THE DRINKING MILK VALUE CHAIN

The following table details the nature of the effects of different public policies at different levels of the value chain. Some policies affect only certain categories of actors while others affect all actors or several categories of actors:

Table 4-0-2 - The different public policies influencing the dairy value chain

Link of the chain	Public Policy	Purpose of the policy
Producers	Investment aids	Subsidies for investments
	CAP aids	Subsidies to farmers
	Subsidies on insurance	Subsidies for climate insurance
	Regulation of production	Recording of phytosanitary treatments, hygiene measures, spreading plan, building standards, etc.
	Nitrate directive	Regulation on levels of fertilisers inputs
	Tax facilities	Tax exemption for investments
	Producer Organisation	Allows producers to gather in common organisations to negotiate the milk collected with collecting organisations.
	Land policies	Regulation of land transfers to consolidate access to land to farms
	Urban policies	Decision on land use (dedicated to agriculture or construction) / have an impact on potential land use for farming, especially in urban areas
Dairy collectors and processors	Legal frame for cooperative groups	Allows cooperatives to mix their activities between private affiliates and cooperatives
	Safety rules on milk collection	building maintenance, infection control, supplier identification, HACCP procedures, etc.
	Safety rules on commercial activities	Sites registration, traceability, movements recording, labelling, quality analysis
	Transport regulations	Traceability, containers control, activity recording, etc.
	Infrastructures policies	Road, trains, ports, etc. allowing milk and dairy products transfers
Retailers	Legislation on store implantation	Opening and expanding stores is eased by legislation to favour competition among hypermarkets and supermarkets: administrative authorisation required only from 1000m2 of commercial space while the threshold was 300m2 before 2008
	Legislation on terms of sales and terms of payments	Specifies the conditions required on contracts and limits the payment delays to 60 days.

	Prohibition of improperly low prices, regulation of promotions (loi EGAlim)	Regulates thresholds under which products cannot be sold
All links or several links concerned	Trade policies (all actors)	Affects the price regulation, competition on milk and dairy products etc.
	Interbranch organisation (producers and processors)	allows under certain conditions a dialogue between actors in the supply chain on certain topics, the promotion of best practices and some market transparency
	Competition policy : joint sales and agreements (producers and processors)	"In the dairy sector, for raw milk, the Common Market Organisation Regulation allows joint sales by agricultural producers so long as the overall coverage does not exceed 33% of the total national and 3.5% of the total EU production." (DG trade)
	Mediation on contracts	Possibilities to invoke a ministry mediator for contentious commercial contracts

4.5 RELATIONSHIP BETWEEN GOVERNANCE, MARKETS AND SUSTAINABILITY

It appears that new market conditions in a liberalised milk-system developed above (volatility, extension of competition paradigm, etc.) are driving factors of the evolutions of the dairy sector. This system of constraints elaborates a frame of actions in which main actors have limited flexibility to reshape production systems.

In a context of growing environmental concerns, this framework puts into question its ability to integrate sustainability. Can milk-sector governance, as we detailed it previously, integrate sustainability modalities? Varieties of representations and ideas of it are promoted in agricultural initiatives. This concept has a large spectrum of meanings, and cannot be reduced to discursive constructions aiming to reshape governance through implementation of sustainability modalities. It appears that sustainability is fully integrated to different market strategies. It is used as an opportunity for segmentation, which has various concrete impacts on practices, from highlighting and valorising practices already existing to collective efforts (made by producers and dairies) to transform or maintain virtuous production models.

4.5.1 CHANGES WITHIN CONTINUITY PARADIGM

Intensification dynamics into dairy milk sector emphasises environmental practices announcement. The end of quotas provoked two main different intensification strategies in Breton farms. Firstly, around 70% of the farms try to saturate the production level in order to optimise their physical productivity and increase milk production. This orientation is developed by farms dependent on external resources. The second is structured around maximisation of economic productivity of the

structure. These farms develop autonomous practices and intend to avoid important investment. They rely almost exclusively on grass and pasturelands and accept a general milk production decrease (Aubert, Tayeb Chérif and al., 2018). We notice an intensification of production systems induced by an increase of herd sizes: grazing based systems are uncommon for herds producing more than 350 000 L per year (Trouvé and al., 2016).

In parallel, two main forms of ecologisation of practices, leading to potential increase of segmentation, are driven by the dairy sector, with the low carbon-emission program and the promotion of grazing production systems.

The CNIEL has launched the program “Fermes Laitières Bas Carbone” (FLBC, meaning low carbon-emissions dairy farms) in 2015. Its will is to reduce the carbon footprint of dairy production by 20% within 10 years. To achieve this goal, various instruments are promoted: the most important one in terms of greenhouse gas attenuation is herd management. It especially includes heifers breeding and herd health. The CNIEL communication over FLBC program is oriented towards economic aspects. The initiative is a way to conciliate making some savings by decreasing production costs, and better environmental practices by constituting more autonomous agricultural production systems.

This initiative integrates pasture in a wide range of tools for decreasing carbon emissions, but the promotion of pasturelands as a carbon sink is limited. In a context of intensification of production systems, suggesting a wide range of tools for sustainability allows not to exclude any production system. As it is intended by the organization, the strategy should benefit to all producers, regardless of the intensification level or production system.

On a long term perspective, this initiative could lead to certain forms of financialisation as well. In November 2018, a low-carbon label has been created through a ministerial decree: through this label, actors leading reduction in greenhouse gas emissions actions will be able to quantify these progresses to monetise them via a dedicated market. Moreover, discourses concerning carbon-emissions decrease can also be analysed in light of a context of volatility: as a tool for lowering production costs, these environmental practices are also a tool to increase competitiveness of French dairy producers.

Other levers intend to influence directly specific practices. Many initiatives guaranteeing a minimal number of days of grazing emerge. Including products under PDO, grazing-milk represents around 15% of the milk collection in France[41]. The growing interest for grazing-system as a segmentation possibility in itself, regardless of the PDO valorisation, is quite recent. Formerly valorised in dairy milk, processors are also developing other dairy products.

To foster this trend, an association “lait de pâturage” was created in Brittany. The Breton region, through its new political role of managing authority since 2015, fosters transition towards grazing systems, especially through agri-environment measures (AEM). There is a strong stake concerning communication for Brittany, touched by mistrust regarding agricultural practices.

In order to regulate the growing heterogeneity of this flourishing segmentation path, the interbranch decided to harmonise this initiative at the national level. If some

[41] “Rations : franchir le cap du sans OGM”, Eleveur laitier, 4 mars 2019

modalities are still under discussion, future specifications will likely ask for a minimum of 120 days of grazing. This target figure is considered as low compared to already existing practices, defining grazing standards to promote practice change.

The approach is often coupled with GMO-free feed. The transition from GMO soy cake to GMO-free feed is still too expensive to be compensated by additional payment offered to producers (in practice, this surplus is around 10 euros per 1000 L). A production system shift towards more autonomous system including more grazing can encourage this pairing.[42] Here is a comment of a production manager in a dairy concerning GMO-free segmentation:

> *The retailers are interested in having new products and being able to get commercial margins on it (...). On sour side, we think about what could bring value. If we work, because we are not numerous in our society, and do not bring any value, then it worries me. The GMO-free today brings no value. What worries us is that it will become a prerequisite tomorrow, which is not normal. And the eastern companies that sell their milk in Germany are no longer able to gain value for their producers, but now they are told if they do not produce without GMO, their production is not sold anymore. (Production Manager in a private dairy)*

These environmental segmentations do not necessarily induce governance rebalance in the chain: on the contrary, they can illustrate imbalance reinforcement. Segmentations are developed to follow market trends and to answer societal demands. Thus, anticipations of market mutations also drive the promotion of system changes. GMO-free milk has already been converted into a standard for the market entry in some neighbouring countries. Considering the market power of purchasing groups of retailers, they can enforce a transformation of practices. Development of environmental practices can be the outcome of the leading position of retailers and can reflect unbalanced market structure if these changes of practices are not accompanied by farm-gate milk prices valorisation.

A move towards practices considered as more sustainable does not always mean transformation of governance modalities. Moreover, ecologisation includes a large spectrum of dynamics which highly depend on markets targeted by industries.

Considering the heterogeneity of the internationalisation trends elaborated above, it appears that products are designed to answer many different quality conventions to improve the fit between supply and demand. For third countries exportation, the focus is mainly on sanitary quality, pushing environmental issues to the background.

4.5.2 THINKING OTHER COMPETITION REGIME? THE EXAMPLE OF BIOLAIT

If the integration of environmental issues seems limited in terms of production system shift in the regime described above, other competition regimes exist and keep questioning the relationship between governance and sustainability. Researchers closed to regulationist perspective consider that private operators are not always strictly profit-driven and can also pursue both long-term stability and the development of a common project. The case of Biolait does not fully match with the territoriality of this framework because the solidarity is not strictly based on a specific territory anchorage. The sense of belonging is more related to the development of a common project, through the expansion of organic agriculture.

[42] *Ibid*.

Biolait has been built in 1994 as a reaction against a feeling of growing dependency towards dairies and their industrial strategies. A common vision is at the core of the agreement. It is structured around sustainability, organic agriculture and effective transparency between the actors. This starting point affects the organisation of the structure, ensures coherency and complementarity between economic, environmental and social project (Bocquet, 2010). Biolait project aims to have a pivotal role in the sector and to participate to maintain remunerative price level.

Biolait is an Economic Interest Grouping (EIG), constructed to respect the cooperative ideal. Territorialised general assemblies, called “RENCAD”, are organized on a regular basis to take decisions. When the price proposed by processors is considered too low by the EIG, they usually prefer to sell it in the conventional market rather than supporting dumping practices. To foster solidarity and dynamism of the milk collection, Biolait has a system of price pooling: each Biolait milk producer receives the same base payment. Collection and delivering costs are mutualised between all Biolait producers. Even if the EIG is not able to channel a truck to the farm, a conventional dairy collects the milk and Biolait guarantees the same base-payment to the producer. Thanks to this system, Biolait participate to the development of organic milk nationally and attempts to launch virtuous circles in more remote areas. Through knock-on effects, critical size of producers converted to organic milk production can be reached: then, the EIG can develop new collection basin. In 2016 for example, half of the newcomers were located in areas where milk collection was strongly declining. The success of Biolait can be measured by its expansion. Volume collection increases by 40 % between 2017 and 2018, and by 25% between 2018 and 2019.

As explained in the second part of this study, Biolait secure and diversify its activities. They develop also tripartite agreements with dairies and retailers, with Biocoop, Système U and Auchan, representing about a third of the volume. (Basic, 2019)

If organic milk production is expanding in a context of strong economic opportunities (bringing the issue of market saturation and potential degradation of market conditions), Biolait goes further than the strict organic approach. Biolait is engaged into a north-north fairtrade perspective. This concept and related stakeholders have emerged in France from the 2000’s, defending key principles such as remunerative prices, transparency, balances commercial negotiations, environmental focus, etc (Basic, 2018). As explained during some interviews, Biolait becomes an informal label, able to certify a long-term commitment for sustainability as well as social link with producers. In a context of complexification of cooperative governance management, Biolait can appear as an example of effective cooperative system. The success of Biolait is directly correlated to the difficulties the chain faced. However, even if Biolait prefigures another competition regime linking environmental practices and more horizontal governance as a whole, the model they developed is still a niche in the drinking milk market.

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ANNEX 4.1: LIST OF STAKEHOLDERS INTERVIEWED

Structure	**Function**
Producers organisation (PO)	Milk producer - President of the PO
Dairy farm supplying Lactalis (private dairy industry)	Milk producer
Producer organisation (PO) supplying Lactalis (private dairy industry)	Milk producer - President of the PO
Danone, private dairy industry	Head of the sustainable development department
Regional Council of Brittany	Head of the agriculture unit
Laïta, dairy cooperative in Brittany	Head of consumer products
Fédération Nationale des Industries Laitières (FNIL) - National federation of private dairy industries	Chief executive
Centre National Interprofessionnel de l'Economie Laitière (CNIEL) - National dairy interbranch organisation	Head of the environment department
Confederation Paysanne - Left wing farmers union	Task officer
Triskalia, dairy cooperative in Brittany	Technical supervisor for milk supplies
Sill, dairy private industry in Brittany	Head of the production department
Even, dairy cooperative	Milk producer - Vice-President of the cooperative

5. GOVERNANCE OF UK CATTLE TO BEEF STEAK VALUE CHAIN

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5.1 OVERVIEW OF UK BEEF STEAK VALUE CHAIN

Beef production is a significant sector within EU agriculture, accounting for 18.8% of livestock production output and 8.1% of overall agricultural output, not including products (e.g. milk) derived from cattle (Eurostat, 2018b). These figures equate to approximately 7.5 million tonnes of beef, making the EU the third biggest global producer of beef, after the United States and Brazil (Copa-Cogeca, 2015, pg.3). In 2016, France (18.7 %), Germany (14.7 %) and the United Kingdom (11.7 %) were responsible for almost half (45.2 %) of EU-28 beef production (Eurostat, 2018a). Beef products come from both beef cattle and dairy herds, with around two-thirds of European beef production originating from the dairy herd in 2017 (EU Commission, 2018).

Stakeholder consultation characterized beef steak as a premium product, popular with UK consumers. Between 2014-2017, beef steak sales saw a 11% increase in value and 12% increase in volume (AHDB, 2018), making steak an important market for processors and retailers. Despite this, beef production in the UK is characterized by variability in profitability. Net margins are only positive for the top third of beef producers, and even then, they are not guaranteed. If non-cash costs e.g. family labour, interest on working capital are added to value calculations, not even the biggest producers are in profit (EU Commission, 2017). This decline in profitability as has been linked to the replacement of production-based subsidies with a single payment scheme (SPS) based on cultivatable agricultural land, first introduced in the UK in 2005 as part of CAP reforms.[43]

In terms of self-sufficiency, the UK had 74.9% self-sufficiency in beef and veal in 2017, compared to Lamb (99.7%), poultry (75.6%), pig meat (52.6) (AHDB, 2018, pg.15). Beef steak of UK origin is valued by consumers and most major retailers' stock only beef of British and Irish origin. Because demand for steak and similar popular cuts of beef is greater than for other parts of cattle carcase, the size of the UK cattle herd cannot always supply requirements, meaning cuts must be imported to meet this shortfall (IMTA, 2016). Most of these imports come from within the EU, with the overwhelming majority from Ireland followed by The Netherlands, which have both increased imports over the last 5 years. Conversely cuts of beef that are not popular with UK consumers are exported to export markets where there is greater consumer demand for them (Ibid). While EU countries buy most of the UK's beef exports, the non-EU market is growing – from 4.6% in 2013 to 12% in 2016 (AHDB, 2017, pg.30). This combination of imported and exported cuts is known as carcase balance, with processors typically being responsible for finding suitable sales channels for different parts of the carcase.

[43] As part of the 2013 CAP reforms, the SPS subsidy was replaced in 2015 by the Basic Payment Scheme.

Britain's decision to leave the EU could have a big impact on both imports and exports, for example if the UK decides to reduce current EU level tariffs on beef imports and if it accepts imports currently banned by EU regulation, such as beef produced with animal growth hormones. Secondly, if there is a sizable rise in beef imports from regions such as South America, where production costs are typically lower (even after export costs are accounted for), this could affect the competitiveness of domestic producers (AHDB, 2016b).

As the rest of this report will show, issues surrounding fairness in the British beef steak value chain are largely linked to fluctuations in farmgate prices and the carcase specifications and grading processes used to determine pricing mechanisms. These issues were the subject of two UK parliamentary inquiries on farmgate prices (2015-2016) and beef grading (2016). The inquiries took evidence from across the value chain and their findings are referred to throughout this report, along with the responses to stakeholder consultation.

In response to these concerns, various regulatory interventions have been developed. A voluntary processor code of practice for the purchase of cattle was introduced in 2015 for example, with the aim of enhancing transparency in transactions between producers and processors. More broadly, there have been moves to increase traceability and collaboration through agri-technological improvements and more integration across different sectors in the value chain.

5.2. Structure of UK Beef Steak Value Chain and the Global Value Chain Governance Model

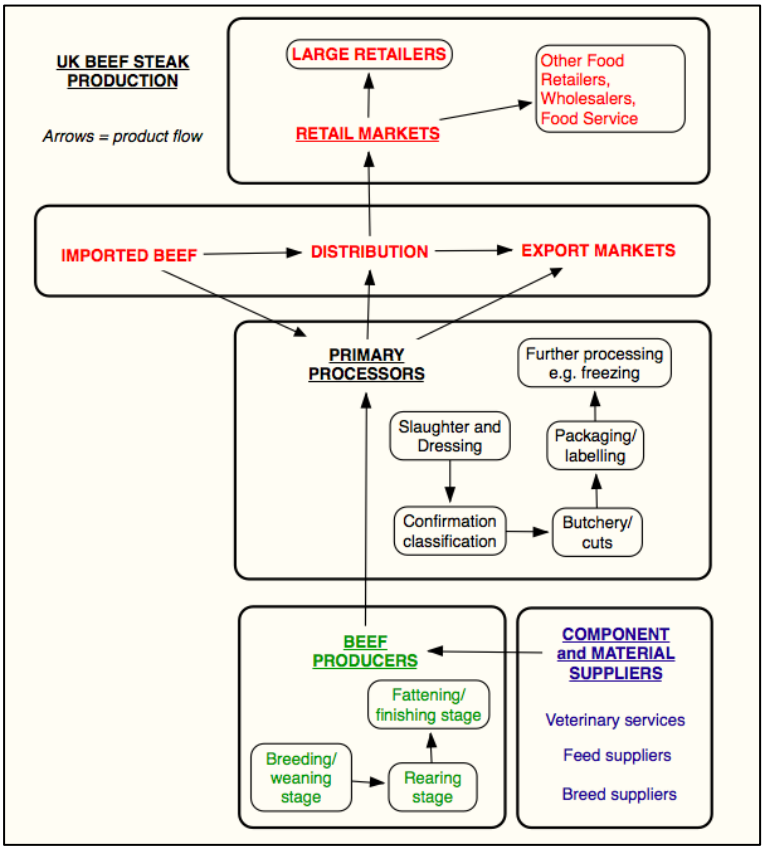

Figure 5-0-1 UK Beef steak production flow. Source: The authors, 2019

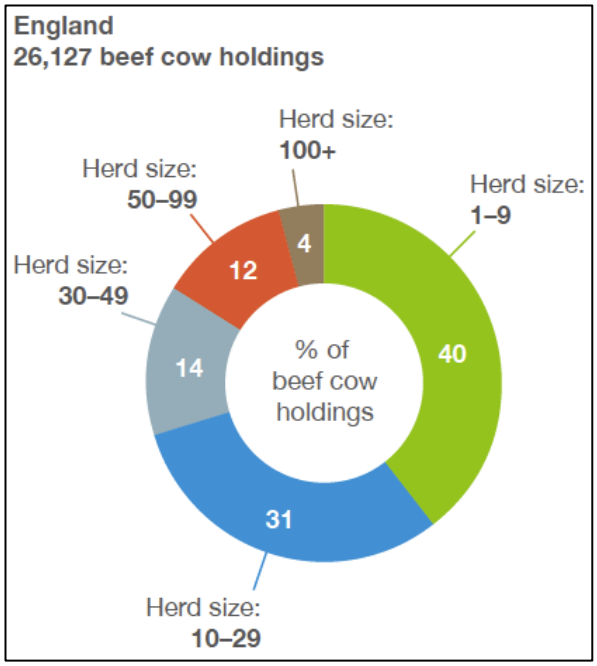

Figure 5-0-2 English beef cow holdings, 2017. Source: AHDB, 2018.

The beef steak value chain is organized into three main sectors: beef production, primary processing and retail and distribution (see figure 1). In the UK, most beef production is found in England and centred in the south west. In 2017 there were 721,000 head of cattle in England on 26,127 holdings. The average herd size in 2016 England was 27 head of cattle, but as figure 2 shows, there were many holdings with less than 10 head, and a significant percentage of holdings with more than 30, suggesting production is fragmented in terms of scale. The statistics are similar for Wales and Northern Ireland, but Scotland has more concentration with an average herd size of 48 head of cattle (AHDB, 2018).

Farm production choices are guided by specifications made by buyers, as well as farm topography and location, and the availability of forage and feed. The average production cycle lasts between 18 months and 2 years, with producers often specializing in one stage and cattle being transported between different farms for each stage. Levels of beef and veal production have increased across the UK from 2014 with 1.97 million head of prime cattle slaughtered in 2017, producing 689,000 tonnes of prime cattle beef (AHDB, 2018). However, while levels of production have risen, the UK cattle population has declined by 30% in the past 20 years, reaching its lowest level in 80 years in England and Wales (6.4 million) in 2012, although there have been modest increases since then. These decreases have been linked to improved productivity in cattle production, but also to the removal of CAP subsidies and a general decline in profitability for producers (AHDB/EBLEX[44], 2009, 2012).

The British processing industry is dominated by seven so called *"mega-slaughterhouses"* (SFT, 2018, pg. 8) which process over 90,000 livestock units annually[45]. The nine largest abattoirs account for 44% of total cattle processing in the UK. One processing plant in Wales, for example, is open 24 hours a day and has capacity to slaughter and butcher 2,400 cattle a week (Ibid). This concentration reflects the consolidation in the processing sector that has occurred in the last thirty years; In 1985 there were 1,000 abattoirs operating in England, but by 2010, there were approximately 202 remaining (EBLEX, 2012, pg.8). These figures correspond with declining numbers of UK butchers (1990 = 15,000 butchers, 2015 = 6000 butchers - SFT, 2018, pg.10). The closure of small and medium sized abattoirs (34% of red meat abattoirs since 2008 - Ibid), and the acquisition of smaller enterprises by larger ones has been linked to retailer volume and production specifications and regulatory responses to BSE and Foot and Mouth, seen as affecting the profitability of small abattoirs more than large ones (SFT, 2018, pg.8).

The closure of smaller abattoirs has also meant a decline in the availability of certain resources for smaller beef producers. "Private kill" services, where abattoirs slaughter individual animals for producers to sell through farm shops or butchers have declined as larger abattoirs can be unable or unwilling to slaughter in such small volumes. It has also led to increased transport times and costs in more remote areas, leading to concerns about animal welfare, traceability and the sustainability of rural economies (SFT, 2018, pgs. 11-13). Finally, approximately 75% of processing workers are from outside the UK (SFT, 2018, pg. 7), a situation that has is under threat by the UK government's plans to leave the European Union. This is particularly significant as current British processing capacity is not always sufficient to meet demand. Most UK exports to EU countries are transported as live animals or whole carcasses, with (further) processing taking place in Ireland or the Netherlands before some of the meat is returned to UK markets, the so called *"carousel effect"* (AHDB, 2016, pg.3).

All processors slaughtering more than 150 cattle a week are required to classify their carcasses using the EU grading classification, known as the 'EuroGrid' or 'Union

[44] The *Agriculture and Horticulture Development Board (AHDB)*, formerly known as EBLEX, is a non-departmental government body created by statute. It is a levy board funded by farmers and growers and some other parts of the supply chain.

[45] Two Sisters St Merryn Foods, Merthyr Tydfil (Wales), Randall Parker Foods, Powys (Wales), Scotbeef (Bridge of Allan) Ltd, Stirlingshire (Scotland), Dunbia Preston ltd, Preston (England), Morrisons Woodhead Bros Meat Company, Lancashire (England), Dunbia England t/a Dunbia (Sawley), Lancashire (England) and Morrisons Woodhead Bros, Spalding, Lincolnshire (England).
Source: *eFoodChainMap:* http://beefandlamb.ahdb.org.uk/efoodchainmap/ (Date accessed: 5th November 2018)

Scale'[46]. Classification is based on key characteristics of the carcase specified by the processor e.g. breed, sex, age, weight, level of fatness and confirmation (level and thickness of muscle). In the UK, the main body responsible for classification is the Meat and Livestock Commercial Services company, who work for beef buyers covering 89% of the total meat purchased (MLCS, n.d). MLCS classification authenticates slaughter and dressing (the removal of skin and internal organs) of a carcase as well as its overall quality. This classification, in turn, determines meat yield potential and the price paid to producers. The most common target specification for beef carcase is R4L, which indicates the level of fat, muscle and overall quality that the retail market requires. In 2016: 56.5% of prime beef carcasses were graded R4L (AHDB, 2017, pg. 40).

The main buyers of British beef are the top 5 multiple retailers[47] who were responsible for 64% of retail meat sales in 2017 (see figure 3). If discount retailers (e.g. Aldi, Lidl) and other more high-end multiples such as Waitrose and Marks and Spencer are included, the percentage increases to 87%. Their dominance in the value chain has emerged over the last 30 years; In 1985, supermarkets accounted for 26% of beef purchases, with the other 72% spread over 21,000 smaller retailers, wholesale markets and butchers (AHDB, 2012, pg. 8).

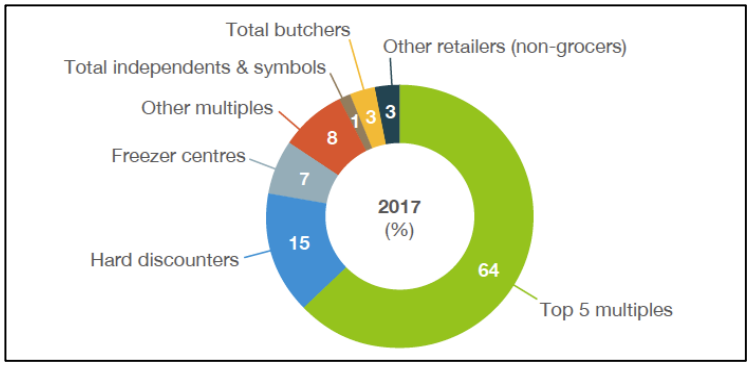

Figure 5-0-3 UK retail meat sales by volume, 2017. Source AHDB, 2018/Kantar Worldpanel.

Looking more specifically at the retail expenditure profile for beef, steak (categorized as frying/grilling cuts in Figure 5-0-4) takes the second largest share of fresh/frozen beef sales in the UK market, accounting for 30% in 2017.

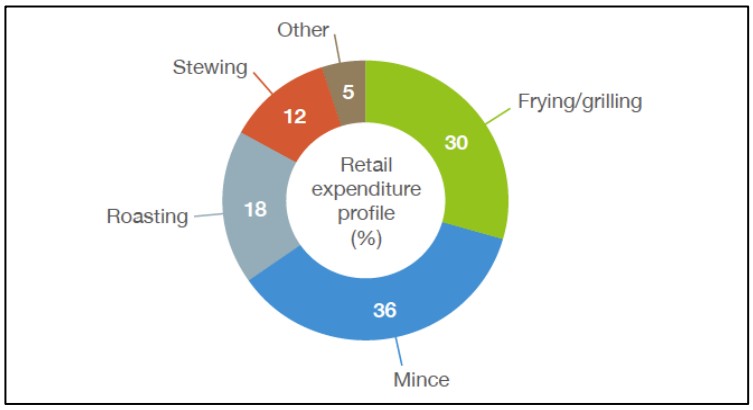

Figure 5-0-4 UK retail beef cuts sales by volume, 2017. Source AHDB, 2018/Kantar Worldpanel.

[46] The 'EuroGrid/Union Scale' beef carcase classification scheme: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/299228/The_Union_scale.pdf (Date accessed: 24th June 2019).

[47] The top 5 multiple food retailers in 2016 were Tesco, Sainsburys, Asda, Morrisons and Co-operative. In 2017, Aldi replaced the Co-op to become fifth biggest UK retailer: https://www.bbc.co.uk/news/business-38890977 (Date accessed: 24th June 2019)

Relationship dynamics between actors in the value chain are typically determined by the nature of the contractual arrangement between a producer and a processor and/or retailer. The structure of purchasing is divided into two distinct phases; the selling of cattle carcases to processors, and the selling of processed cuts to retailers. These two phases reflect the transformation of the carcase to beef steak, and the different dynamics created by carcase balance concerns throughout the value chain.

In the first phase, processors buy individual cattle carcases from producers which they process into different cuts for different buyers and different markets. As explained above, it is the responsibility of processors to 'balance' the carcase i.e. to find sales channels for different cuts and to make supply decisions around buying/freezing/export of different parts of the carcase. These are ways processors can ensure their costs are covered and create extra revenue, but a lack of carcase balance was identified by stakeholders as leading to devaluing of the whole carcase and the price paid to producers. In the second phase, retailers will then buy multiple cuts from different cattle carcases according to their commercial requirements.

This difference in the product being purchased by processors and retailers means that it is more difficult for retailers to have direct contracts with producers, as retailers are purchasing cuts of steak from potentially thousands of beef producers at different times of the year. Producers sell cattle to a processor when they deem them to be of of the right age, weight and condition for sale, and do not typically know where the different parts of the carcase end up in the value chain. In this structure, instead of contracts, grading classifications and correlating pricing grids form the basis of exchange between producers and processors. There are exceptions to this, for example retail contracts exist for Aberdeen Angus bred cattle, which are considered to produce beef of a particularly high quality. One UK retailer consulted for this research described their contracts with 1200 Aberdeen Angus producers to supply beef their premium retail range as working well for both producers and retailer. Producers on were given 12-month contracts and were paid the base price of the processor plus a bonus calculated on a producer's ability to meet certain production, welfare and quality specifications (Agricultural manager, UK retailer). Outside of more specialist niches, retailer-producer development groups are less common for beef than for other value chains, currently estimated to cover 10% of the industry (House of Commons, 2016c), but there are examples of successful partnerships; The high-end UK retailer Waitrose for example has more direct relationships with all its producers, including long-term contracts and minimum pricing measures. Waitrose also has a livestock steering group for its meat supply chains that acts as a forum for information sharing and collaborative problem solving (House of Commons, 2015a, 2015b).

Between processors and retailers, a typically much closer relationship exists, with average contracts lasting between 3-5 years. As discussed in section 5.4, these dynamics are viewed as more collaborative, with processors and retailers working together to develop products and production strategies to meet market demand. Retailers and processors both have product specifications reflecting desired quality, but they can also indicate particular market drivers and consumer trends such as preferences for less fatty cuts, higher animal welfare standards or increased traceability. A recent example is Marks and Spencer, a high-end UK retailer, working with its beef producers to guarantee 100% traceability through DNA testing back to specific farms and animals.[48]

[48] https://corporate.marksandspencer.com/media/press-releases/2018/m-and-s-raises-the-stakes-with-unrivalled-new-british-beef-traceability-campaign (Date accessed:24th June 2019)

Applying the Global Value Chains governance perspective (Gereffi et al, 2005) to these dynamics, beef steak can be characterized as a customized 'premium' product, with desired quality attributes codified (the EuroGrid) in complex transactions between producer, processor and ultimately retailer. To produce steak therefore requires high levels of supplier capability. In this scenario, suggestive of a modular value chain, both beef producers and processors would turn-key suppliers for retailers, (figure 5, part B). However, coordination exists more fully between processors and retailers than it does between producers and either producers or retailers (except for specific niches such as Aberdeen Angus production). As this research will show, producers are more akin to captive suppliers (figure 5, part A) in the sense they are dependent on buyers who control the specifity of transactions, and can change them without consultation, thereby effecting the ability of producers to meet the required standard. This captive dynamic is reinforced by the levels of concentration in both the processing and retailing sectors, giving producers little alternative in terms of who they can supply.

These dynamics can partly be explained by the transformation that occurs at processing level from cattle carcase to beef steak. The difference in the product brought and sold by the processor allows the processor to exercise considerable control over the wider value chain, and particularly over producers. One interviewee described how processors can control volume from producers to retailers and have more distribution options available to them through food service and export markets. The interviewee contrasted this with retailers, who they characterized as essentially product receivers, and producers whose risk lost value if processors refuse their cattle (Agricultural manager, UK retailer). However, this view downplays the considerable power retailers have in setting production specifications for processors. Taking this into account, elements of a more relational value chain emerge (Figure 5-0-5, part A); Two powerful firms in highly concentrated sectors, mutually dependent on each other's competencies, collaborating closely to make complex products together.

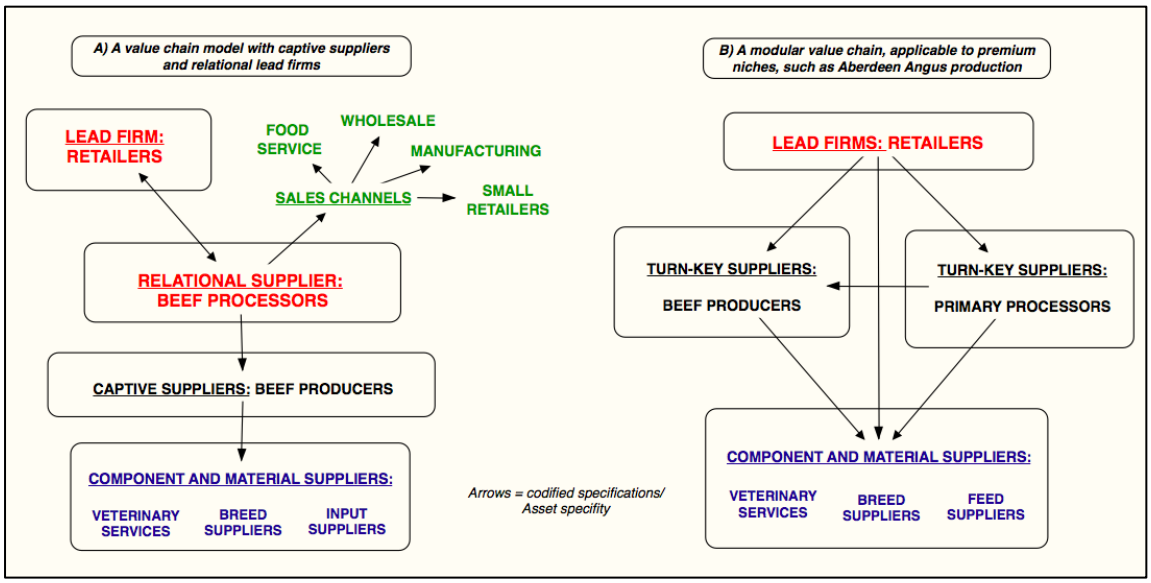

Figure 5-0-5 UK beef steak GVC models. Source: The authors, 2019.

5.3 EU AND UK GOVERNANCE: KEY POLICIES AND REGULATIONS

Table 5-0-1 below contains the main regulations affecting beef production in the European Union, and the comparable or implementing UK legislation. The main areas of concern are fraud and transparency in the value chain, food safety and animal health, with most of the responsibility for implementation located at the production and processing levels. The Common Agricultural Policy provides supports to farmers, playing an active role in increasing the security and profitability of agricultural livelihoods. The effects of these supports can pull against wider market goals though, as this extract from a recent report on the cattle sector explains: *"Determinants of the structure in the EU bovine meat sector are mainly related to the consumer side in the meat supply chain. On the one hand, retailers are translating shifting consumer demands into reward systems for specific breeds and production practices; on the other hand, regulatory support and existing quality grading systems are stimulating quantity rather than quality production in the sector"* (EU Parliament, 2017a, pg.35).

Table 5-0-1 Key EU and UK Policies and Regulations. Source: The authors, 2019

Common Agricultural Policy • Basic payments and other income supports e.g. young farmers scheme, payments for sectors in difficulty, compensation for farmers operating in areas of natural or specific constraints. • *EU Agricultural Fund for Rural Development* (1305/2013) – farm level advisory services. • *Common market organisation (*1308/2013) – Works to reduce bargaining power gap between producers and other parts of the chain, and to stabilize markets/prices for farmers in selected sectors including beef and milk. Incorporates fraud prevention and authenticity protections. and restricts use of animal health products to ensure quality and safety in the chain.
General Food Law (178/2002) and Official Controls (2017/625) • Principle procedures on food safety including work of Food Safety Authority, RASFF and other traceability systems, product withdrawal and recall. • Regulates fraud and adulteration prevention, labelling, advertising, presentation, display. • Animal health and welfare provisions, control of animal by-products in food chains. **UK implementing regulations or applicable UK regulation:** • The Food Safety and Hygiene (England) Regulations (2013) • The General Food Regulations (2004) - in Scotland and Wales • Food Standards Act (1999)
Organic Regulations (834/2007) and implementation (889/2008) • Stipulates organic production standards, control and labelling requirements of organic products. **UK implementing regulations or applicable UK regulation:** • Organic production standards are regulated through organic certification bodies who are approved by the government. The largest certification body in the UK is the Soil Association. Organic certification covers livestock production, processing and feed.

Competition + Fairness

- Use of Competition Law to ensure fairness. Controls on mergers, data-sharing, price-fixing and other unfair commercial practices/consumer protection policies e.g.
- Unfair Commercial Practices policy (business to consumer) (2005/29)
- Misleading and Comparative Advertising Directive (2006/114)

Fraud, Transparency, Food Information

- Food Information to Consumers Regulation (1169/2011)

- Labelling regulation (origin, properties, method of production), use-by dates, durability, storage.

- Regulation on nutrition and health claims (1924/2006)
- Regulation on quality schemes for agricultural products and foodstuffs (1151/2012)
- EU Food Fraud Network
- EU Beef carcass classification grid 'EuroGrid' or 'Union Scale' (based on classification of bovine, pig, sheep carcases regulations - 2017/1182 and 1249/2008)
- Regulation on identification and registration of bovine animals and labelling of beef and beef products (1760/2000) and controls (1825/2000)
- Regulation on marketing of meat and bovine animals aged 12 months or less (566/2008)

UK implementing regulations or applicable UK regulation:

- Food Information Regulation (2014)
- Compulsory beef labelling scheme, administered and enforced by Rural Payments Agency (England and Wales) and the Scottish Government.
- The Beef and Veal Labelling Regulations: England (2010), Wales (2011), Scotland (2010)
- Regulation on identification and registration of bovine animals and labelling of beef and beef products (1760/2000) and controls (1825/2000).

Food safety + Hygiene

- Hygiene rules for food of animal origin (853/2004) and official controls (854/2004)
- Hygiene within livestock establishments including equipment, design of processes. Health and welfare of animals accepted for slaughter, identification of animals (passports, ear tags etc)
- Regulation on hygiene of foodstuffs (852/2004) inc. HACCP principles
- Regulation on identification and registration of bovine animals and labelling of beef and beef products (1760/2000) and controls (1825/2000)
- Regulation on animal by-products + derived products not for human consumption (1069/2009)
- Regulation on microbiological criteria for foodstuffs and contaminants in food chain (1881/2006)
- Regulation on salmonella and other food-borne zoonotic agents (2160/2003)
- Regulation on material and articles intended to come into contact with food (1935/2004)

UK implementing regulations or applicable UK regulation:

- The Food Safety Act (1990)
- Food Safety and Hygiene (England) Regulations (2013), Scotland (2006), Wales (2006)
- The Animal By-Products Enforcement Regulations: England (2013), Wales (2014), Scotland (2013)
- Cattle Identification Regulations (2007)

In the UK, 852/2004 and 853/2004 apply to abattoirs, on-farm slaughter facilities, cutting plants and wholesale markets. They are enforced by Food Standards Agency (FSA). Where a processing establishment is co-located with an approved slaughter or cutting plants, they are also approved by FSA e.g. minced meat, mechanical separation of meat, re-wrapping. *"Establishments that cut raw meat exclusively for the manufacture of meat products…require approval in respect of their manufacturing activities….However, because they do not place the meat they cut on the market as fresh meat they will not require approval as a cutting plant and, therefore, do not require veterinary control."* (FSA, 2018, pg. 8). Some exemptions for retail, slaughter for domestic consumption.

Animal Health and Welfare

- New Animal Health Law (2016/429) – prevention and control of animal diseases inc. foods of animal origin, animal by-products
- Regulation on protection of animals at the time of killing (1099/2009)
- TSE Disease control (CJD, BSE etc) (999/2001)
- Directive on protection of animals kept for farming purposes (98/58/EC)
- Regulation on medicinal products for animal and veterinary use (726/2004)
- Safety of pesticides and plant protection products (1107/2009, 2009/128, 396/2005, 2003/2003)
- Directive on hormone use in stock farming (96/22/EC)

UK implementing regulations or applicable UK regulation:

- Animal Welfare Act (2006) – Welfare of Farmed Animals regulations included in the act (2007)
- TSE Regulations: England (2010), Wales (2008), Scotland (2010)
- The Bovine Products (Restriction on Placing on the Market) (Scotland) (No. 2) Regulations 2005
- The Welfare of Animal at the time of Killing: England (2015), Scotland (2012), Wales (2014)
- The Welfare of Animals Transport Order – England (2006), Scotland (2006), Wales (2007)

Social + Environmental

- EU Pillar on Social Rights - principles relating to equal access and opportunity in in labour markets, fair working conditions, social inclusion and welfare protections.
- Minimum wage laws - The EU currently has no law on minimum wages, but in 2017 Commissioner Juncker stated that the EU should have such a policy and some MS do.
- Directive on part-time work (97/81), Directive on fixed-term work (99/70), Directive on working time (2003/88), Directive on temporary agency work (2008/104), Directive on seasonal workers (2014/36).
- Small Business Act (2008) – market support for small farms and producers.

- Short food supply chains - financial (and other) supports under rural development policy.
- Late Payments Directive (2011/7)
- Supply Chain Initiative (2013)
- EU Platform on food losses and food waste (2016)

Private Schemes

- UK: Red Tractor Assurance Scheme for livestock, dairy, crops and fresh produce for the whole supply chain. Certification covers: staff and labour, traceability, animal health and welfare, husbandry and veterinary services, animal housing, feed and water and nutrient management, livestock transportation and responsible use of agrochemicals (Red Tractor, 2018a). Benefits for producers include higher farmgate prices and consumer confidence in quality and welfare.

Established in 2000, it currently covers 83% of farm production in the UK. There are currently 78,000 farmers registered on the scheme and 700 companies licensed to use Red Tractor labelling on packaging (Red Tractor, 2018b). In 2014, there were 59,000 members, at that time 24,000 of these were beef and lamb producers and 11,000 were dairy. This represented 82% of finished cattle and 95% of litres of milk produced in the UK (Red Tractor, 2015).

- UK: Processor Code of Practice for the Purchase of Cattle (2015).

Developed by the National Farmers Union and the British Meat Processors Association, the voluntary code aims to build trust between processors and producers and enhance transparency in commercial relationships. This includes open and clear information about processor conditions of trade such as price, premiums and deductions, as well as classification grid specification and other production requirements (BMPA, 2015).

5.4 GOVERNANCE, FAIRNESS AND RELATIONSHIPS IN THE UK BEEF STEAK VALUE CHAIN: FINDINGS

This last section draws on the findings of this report, the UK parliamentary inquiries into farmgate prices (2015-2016) and beef grading processes (2016), and the outcomes of stakeholder interviews to analyse governance and relationship dynamics in the UK beef steak value chain. A clear concern that emerges is the lack of transparency and effective communication across the chain relative to other agricultural sectors. Stakeholders discussed information asymmetries and limited information sharing between different parts of the chain, and tensions caused by feelings of mistrust in key relationships. These dynamics were particularly visible when actors' different perceptions of specifications and grading decisions. Various regulatory interventions aimed at enhancing options for recourse open to producers have been introduced, and plans for further integration of the value chain have been discussed, but it remains unclear what future direction(s) governance of the sector will take.

5.4.1 PRICE AND CONTRACTUAL ARRANGEMENTS

As section 5.2 shows, it is not common practice for beef producers to have formalized contracts with processors or retailers. In their absence, terms and conditions of sale are determined through processor specifications and carcase classification. Each grade on the EuroGrid is overlaid onto a processor's payment grid, this along with the carcase deadweight serve as a proxy to yield potential and provide the base price for the animal. Processors then apply a series of bonuses and deductions based on their specifications for qualities and characteristics[49]. In 2015, changes to the payment grids and deductions made by some processors were perceived as unfairly devaluing farmgate beef prices (AHDB, 2016a) and the practices were the subject of the UK beef grading inquiry.

Evidence to the inquiry from two leading UK farming organisations accepted that some price variation was expected in a market system, but that new payment grids and new production deductions were being applied disproportionately across the sector. In particular, that they were being used in ways that harmed overall value in the beef sector: *"Companies will make deductions based on the grid system to come up with the final price and value of the animal. For things that were deductions, such as a lean animal, that deduction was taken when there was a large quantity of cattle coming through. One of the meat companies this week that was doing that, because they are short of cattle, have now changed that deduction and no longer do it, which makes me consider that the reason for doing the deduction in the first place was to devalue the cattle; it was not for proper reasons of selling on that product."* (National Beef Association - House of Commons, 2016c pg.3).

The National Farmers Union further challenged the fairness of pricing mechanisms. Their evidence suggested that preferential pricing practices ("sweetheart deals") were being used for favoured, often larger producers, with smaller producers treated differently: *"They (the processors) will basically have sweetheart deals going, where you are touching on how they choose to implement the grid, basically. The grid and the classification stands, but what will happen is they will not apply the draconian penalties on a larger processor [sic. – read as producer] who sends to them regularly.*

[49] Common bonuses are for breed, desired age and weight. Correspondingly, deductions are applied for ages, weights, fat class and muscle confirmation that do not suit processors markets.

Ringing round people prior to this to try to get some examples from large producers that I could actually use was very hard. They were all scared of the relationship they had…. that if it became public knowledge that they get a little bit extra…. I had a hell of a job getting this information out of them. The small guys, unfortunately, do not have the volume there so they cannot get it, and they are always exposed to the harshness of the grid" (National Farmers Union - House of Commons, 2016c, pg. 23).

Furthermore, the National Farmers Union felt that the weekly average prices for beef published by processors and the AHDB failed to take these relationships dynamics into account, making the information less reliable for use in the wider industry: *"The published price is one thing. I question the published price a lot, because there are so many sweetheart deals going on within the industry that the published price is not very reflective".* (National Farmers Union, House of Commons, 2016c pg.9) This view was also discussed by a retail stakeholder who suggested that the AHDB published price was often different to what processors pay, giving the example of a producer who consistently brings 50 cattle to a processor getting a 10/20p bonus premium because they are a regular supplier, whereas a new producer bringing in a smaller amount of cattle will get the lowest price *(*Agricultural manager, UK retailer).

These perceptions were disputed in evidence given to the grading inquiry by representatives from the processing industry[50] by processors. From their perspective, changing prices and quality standards were a response to changing market preferences for beef, particularly for steak. One processor linked the changes to what they called the "*premiumization"* of steaks in the UK market: *"If we look at what has happened in the last three to four years in the British beef trade, whilst the top line demand figure has not changed by very much, within the total beef consumption we have what I would call a premiumization of steaks within our supply chain. That premiumization has come about through dry aging, maturation periods or breed specific. What is most critical is that the new way of promoting steaks at retail level is at fixed weight. When you go to a fixed weight model it is important that the raw material that you bring in is more consistent…….That has certainly changed our behaviour and hence we would have changed our pricing mechanism to reflect that change in demand.* (ABP, House of Commons, 2016d, pgs. 4-5).

Processors also stressed their primary role was to supply what their customers wanted to purchase. The following extract from the inquiry encapsulates the view in their evidence that producer dissatisfactions were a problem of communication, with producers lacking understanding of what the market requires: *"Many of us have spent many years trying to work with farmers to encourage them to supply what we are looking for in the marketplace. To do that, the grid adequately communicates what we do and do not want. Unfortunately, farmers respond far more clearly to penalties that they do to premiums. Whenever we go onto a new farm trying to encourage a supply the farmer is always more concerned about what we do not want rather than what we do want. That is part of the reason why we are where we are"* (2 Sisters, House of Commons, 2016d, pgs.8-9).

[50] The processors represented at the grading inquiry were ABP, Dunbia and 2 Sisters.

Another area of disagreement related to live animal transportation, for example from a specialist rearing farm to a specialist finishing farm. The '4 movements' deduction, which limited how many times an animal could be moved, had not previously been widely enforced. Evidence from the beef grading inquiry showed how the decision to begin implementing it in 2015 was viewed by farming organisations:

Inquiry Panel Member: *Were the producers, rather than the processors, consulted about this new deduction?*

National Farmers' Association: *I think it was McDonald's who were the first ones to bring this in. The processors then picked up on it, because many processors sell to McDonalds and they use that to clear up the forequarter meat. When McDonald's insisted on this, everybody looked at it and thought, "Well, if it's what McDonald's want, we will all want it." It then just sweeps over. You find that that happens with all the processors. If somebody ups the ante a little bit to be a bit different, everybody is very quick to do the same.*

National Beef Association: *The consultation to the producer farmer was being told, "Those cattle are now worth 10 pence a kilo less." That was the consultation process. (*House of Commons, 2016c pg. 11).

Producers felt processors had started enforcing the deduction because McDonalds, a powerful actor in the value chain, wanted to send a positive animal welfare message to its customers. They felt they had not been consulted and that the change had been brought in too quickly for producers to adapt without losing money on cattle already in production: *"Although many of the processors had in place the penalties for the four moves, they did not choose to use it. For a long time they did not, and then they applied it just like that. That is when it hit hard. They might say, "It has always been there," but the fact that they never used it and then they brought it in overnight was most unfair".* (NFU, House of Commons, 2016c pg. 17) In response, processors disputed that had given little notice on the four movements deduction, again stressing a lack of effective understanding by producers: *"We have lots of discussion groups with our farmers. It is not that we are not telling them. It may be the case that some of them are not listening"* (ABP, House of Commons, 2016d, pg.14).

The beef grading inquiry did not produce a final report into its findings. A report by the AHDB into 2015 price changes concluded that changes to base prices and the introduction of new deductions had resulted in between £145 and £160 million in lost value (AHDB, 2016a). However, in its conclusion, the report didn't view this as necessarily unfair, instead saying it reflected the need for the supply of more reliable carcases by producers. Pricing changes were, it said, a *"clear message to producers about the importance of delivering cattle which consistently meet the target specification"* (Ibid, pg. 22).

Taken together, these different perceptions are indicative of tensions across the chain. They indicate insufficient levels of transparency about production targets which are particularly felt by producers and their representatives. Reflecting more broadly, stakeholders discussed a lack of shared cross-sectoral understanding about how the wider chain operated and what final product is valued in the marketplace. This was most clearly seen in discussions around changing customer preferences ("premiumization") for beef steak and the role of producers to make a product suitable for the market: *"What they (beef producers) don't seem to understand is that there's a supply chain, you're not a farmer, you a business person, you've got a product to sell, that product has to be something that the customer wants at the end of the chain"* (Agricultural manager, UK retailer).

In another example, representatives from the retail and processing industries suggested that producers would become upset at the difference in farmgate prices for carcases and retail prices for steak because lacked appreciation for how processors add value to the final steak produced. One stakeholder described how producers didn't always see the difference between producing a good animal and making a good steak, that processors turn carcases into steaks, adding value through their cutting and processing specialisms such as dry aging (Grading Oversight Organisation). Similarly, another stakeholder discussed how, from their perspective, producers didn't see the labour and operational costs that occurred within the value chain after the farmgate and therefore didn't appreciate their value (Agricultural manager, UK retailer).

These differing views on communication and transparency reflect the differences in the way relationships are structured across the value chain. Of particular significance is the lack of contractual arrangements between producers and processors or retailers, and the large numbers of producers compared to concentration in both the processing and retail sectors. One UK retailer, for example, discussed how they source their beef from approximately 20,000 farms across the United Kingdom and Ireland, often only purchasing a few cuts from each animal. This creates variability in the level of interaction between producers and the markets they supply with producers often unaware of who the end buyers of their carcases are. This structure makes it harder for retail-development groups to be effective. One retail interviewee reflected that fragmentation in the beef chain made it harder for retailers to influence sectoral change and develop relationships with producers. Instead, these relationships were largely conducted through processors, and while they (the retailer) would share specification requirements with processors, they wouldn't necessarily share them with producers, leaving this to processors (Agricultural manager, UK retailer).

In contrast, relationships between processors and retailers were seen as much more collaborative. They typically involved a contract between processor and retailer over 3-5 years and stakeholders characterized them as long-term, stable and cooperative partnerships involving *"give and take"* on both sides. The key basis of collaboration was ensuring continued supply that accounted for seasonal variation in cattle numbers and customers preferences, essentially producing what the market wants at any given time (UK beef processing organisation). This involves close coordination, trust and regular communication. One stakeholder described how sales forecasts and market research information is often shared by processors and retailers when they *"build a (production) plan together"* (Beef buyer, high-end UK retailer). Processors and retailers were described as having detailed knowledge about each other businesses. One retail stakeholder for example, described choosing processors who didn't also supply the retailer's direct competitors, and the regular audits the retailer would carry out on their contracted processor's capabilities. The audits would be based on commercial and technical requirements, but also on health and safety and animal welfare concerns (Agricultural manager, UK retailer).

However, despite this closeness, the issue of carcase balance adds complexity in the relationship dynamics between processors and retailers. In both the beef grading inquiry and during stakeholder consultation, retailers were keen to distinguish the parts of the value chain they are not engaged with, such as how bonuses and deductions were applied to producers (Livestock supply chain, UK retailer, Agricultural manager, UK retailer). In another example, one UK retailer described the EuroGrid classification process as something they had no power over, stressing their role as a purchaser of cuts, not carcases: *"It (the EuroGrid) is opaque to us. We can understand the drivers behind it, but we cannot see what the processors are doing with a beef animal, other*

than the bits that we are buying" (Tesco, House of Commons, 2016d, pg. 40). This distancing indicates, as discussed in section 5.2, how retailers can occasionally downplay their power and influence over producers in the value chain. However, as the next section shows, there are also moves by retailers to exert more direct control in their relationships with producers.

5.4.2 Regulatory Interventions

In this context, regulatory interventions have focused on improving the level of recourse open to producers unhappy with grading and pricing decisions, and on improving transparency and collaboration across the whole chain.

The most significant intervention has been the Processor Code of Practice for the Purchase of Cattle. Introduced in 2015, the voluntary code was agreed by the British Meat Processors Association and the National Farmers Union and aimed to increase transparency and trust between producers and processors. Processors who sign up agree to have openly available and clearly defined terms and conditions of sale. The code specifies that information should be provided on: base price, target specifications and grades, premiums and deductions related to weight, sex, age, number of animal movements and other relevant terms related to transport and processing charges. Most importantly, processors who sign up to the code are required to give 12 weeks' notice of any changes to their terms and conditions (BMPA, 2015).

Market take-up of the code has been mixed with some processors (ABP, Kepak, Randall Parker, 2 Sisters, Woodheads and Dovecote Park) joining, and others, such as Dunbia and Dawn Meats declining to. Farming organisations have broadly welcomed the code but have voiced concerns that the notice period of 12 weeks, while an important step forward, is not sufficient considering the length of beef production cycles. There is also concern that the code lacks powers of enforcement if breached, especially when making a complaint could be damaging to the reputation and/or business of the complainant. Both processors and farming organisations have suggested that the code would need to become compulsory with the possibility of expansion into the retail sector to further improve its usefulness for the value chain in the long term (House of Commons, 2016c, 2016d). The UK government supported the development of the code as a means to improve transparency across the chain but following its introduction in 2015, further development of the code is not being driven forward by any group. However, the potential for the government to develop the contractual requirements of the code and perhaps to make them compulsory is included in the draft agriculture legislation[51] [52] before parliament to regulate and govern agriculture after the UK's exit from the European Union (at the time of writing).

Beyond the agreements in Processor Code, an expanded role for contracts between producers and processors was discussed as part of the 2016 beef grading parliamentary inquiry. Evidence from stakeholders showed that processors saw long term contracts seen as traditionally not working for larger livestock, except for niche products such as organic or veal (House of Commons, 2016d, pgs. 26-28). Farming organisations gave a more mixed response, arguing that while they could provide some security and suit some parts of the chain, it was unclear how well they would suit the structure of production as cattle move between different farms and different producers at different points in the their lifecycle (House of Commons, 2016c, pgs. 35-

[51] Draft Agriculture Bill, section 27: https://publications.parliament.uk/pa/bills/cbill/2017-2019/0292/18292.pdf
[52] Draft Agriculture Bill explanatory notes clause 25: https://publications.parliament.uk/pa/bills/cbill/2017-2019/0266/en/18266en.pdf (Date accessed for both footnotes: 24th June 2019)

36). Importantly, they again questioning their enforceability, and their perception of lack of trust within the value chain: *"To have a contract, you need to have trust between the two that enter into it. It is like a marriage. You are not going to marry someone you do not trust. For us to enter contracts we have to have trust. There is none. If we have contracts for the future—there are some contracts at the moment, but more contracts—who is going to ensure those contracts are fair? Who is going to arbitrate on those, and ensure that what we are doing and are entering into is enforced in some manner? I have seen positions where supposed contracts that were cast-iron were not at all."* (National Beef Association, House of Commons, 2016c pg. 18).

As well as changes to contractual agreements, there was interest from stakeholders in improving transparency and communication through expanding retail development groups linked to and moves towards more integrated supply chains. Giving evidence to the beef grading inquiry for example, Tesco compared the progress they had made with the dairy producer development group to the situation in the beef value chain: *"Frankly, we found this with dairy: the processors were not necessarily as good at conducting information to dairy farmers as we wanted to be, so we took over, and we think that system will be replicated, and has been in some other places, because it is a communication process…….. It would be our ambition to build the beef group up for Tesco in precisely the same way as we have done on potatoes and we did previously on dairy. It seems to work. This is the lowest-consolidated part of the food sector. It is the toughest to get to the majority, but that does not mean you should not try. It is our responsibility."* (Tesco, House of Commons, 2016d, pg. 37).

This viewed was echoed by interviewees, who saw the potential for more integration. One retail interviewee for example discussed the potential more direct input from retailers in production through involvement in genetics, feed and rearing decisions. The advantage, according to the interviewee was more transparency: *"If you have an integrated model like that, it's very much open book between everyone, because everyone wants it to be fair" (*Agricultural manager, UK retailer).

Similarly, another retailer discussed how integration could led to greater levels of coordination and information sharing within the chain, and greater sense of joint investment in the success of end product (Livestock supply chain, UK retailer). There are significant challenges to this more integrated model, in particular the number of beef producers currently needed to supply retail demand, and it remains unclear what direction this process will go in. Successes in other value chains and in Aberdeen Angus production show the potential of this approach, however.

Lastly, there was an interest in agri-technological solutions as a means to improve transparency and the smooth functioning of the chain. In 2018, the Department for Environment, Food and Rural Affairs (DEFRA), along with industry partners announced the development of a Livestock Information Service to provide enhance traceability across multi-species livestock value chains. Using electronic ID digital technology to collect, track and store data on many aspects of cattle production, veterinary and transportation information. (AHDB, n.d, NFU, 2019). Another technology, Visual Imaging Analysis (VIA) was introduced in the UK in 2014. VIA allows for processors to grade carcases using video cameras and imaging software that analyzes information about carcase confirmation and fat cover (RPA, 2017). VIA is administered through the Rural Payments Agency who also regulate the Meat and Livestock Commercial Services company, the main classification body in the UK. VIA software is more commonly used in Ireland and is not in use in all the major processors. Problems with the technology were raised as part of the beef grading inquiry, with questions about whether it effectively amounted to a new grading system and led to

lower base prices per carcase (House of Commons, 2016c and 2016d). However, the potential in VIA to keep permanent photographic records of cattle carcases could prove beneficial for settling price disputes, and for improving consistency of grading across the industry. One interviewee discussed moving toward VIA as a positive step towards pay producers according to saleable meat yield potential for different cuts, rather than the price per kilo of carcase deadweight of the current system *(*Agricultural manager, UK retailer).

5.5 CONCLUSIONS.

Beef steak is a highly customized 'premium' product within the UK beef value chain. This report has shown the difficulties experienced in communicating buyer specifications and customization, making it difficult for actors to agree on production processes that consistently meets market requirements. This in turn has led to different perceptions over the fairness of pricing mechanisms and contractual processes and to accusations of unfair trading practices. Reflecting more broadly, the key tensions in the chain have emerged from the different perceptions of where value is created. Beef producers add value in the way they rear and produce cattle, but value is measured through the creation of the carcase and in the creation of the steak. Whereas producers make cattle, processors make carcases through their butchery and dressing skills, and they make steaks through further processing of the carcase. This means that while producers make the raw material for the final product, the final product's value is largely under the control of processors.

From a GVC perspective, the transformation of cattle carcase to beef steak and the specificities of steak production have created a two-tiered value chain. At the cattle to carcase stage, a captive value chain is the result of the power processors have over producers, with processor concentration meaning producers have few options over who they supply and little input into specifications or price. The carcase to steak stage is more akin to a modular or relational value chain, with power essentially divided between two firms. Processors derive their authority from their ability to add value in the supply of highly customized products, whereas retailers ultimately drive the standards or specifications of production, based on customer demand. Correspondingly, while the first stage is characterized by a lack of transparency and effective communication, actors in the second stage work much more collaboratively, with less asymmetries of information and power.

Governance interventions have so far focused on the stage between producers and processors and been aimed at strengthening the level of recourse producers who are unhappy with pricing can have e.g. the voluntary processor code. This has been largely private led, with the potential for more integration and transparency found in expanding retail development groups and the use of new agri-technologies. Once the new UK Agriculture Bill is introduced, which route government policy will take on all livestock value chains will become clearer.

5.5.1 STAKEHOLDER INTERVIEW LIST

Table 5-0-2 Stakeholder Interview List

Interviewee Identifier	Date of Interview
Grading Oversight Organisation	20th February 2019
Beef Buyer, high-end UK retailer	18th March 2019
Livestock supply chain, UK retailer	19th March 2019
Agricultural manager, UK retailer	28th March 2019
UK beef processing organisation	29th March 2019
UK beef farming organisation	1st May 2019

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6. GOVERNANCE OF GERMAN CATTLE TO BEEF VALUE CHAIN

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Beef production is the third most important meat production after pork and chicken (LEL & LfL, 2018). Several major trends have affected the beef industry in the last two decades:

- The number of beef farms and cattle are decreasing;
- A concentration of processing companies;
- The number of actors along the value chain has been significantly reduced;
- Supermarket chains are actively developing their own secondary processing units;

The German beef value chain could be described by two parallel existing value chain models:

- the captive model reflecting the relations between farmers and primary processors.
- the relational/modular value chain model between processors and retailers.

6.1 INTRODUCTION TO BEEF SUPPLY CHAIN

In Germany, beef is the third biggest source of meat after pork and chicken (LEL & LfL, 2018). The number of cattle is at the level of 12,28 million in Germany which is reduced from 14,57 million in 2000 (DESTATIS, 2019). The German beef balance sheet shows that the beef production has reduced from 2,27 million ton in 1991 to 1,17 million ton in 2017 (BMEL, 2018). At the same time, beef consumption per head has dropped almost 4 kg in Germany during the same period. The aggregated statistics shows that Germany has turned from net exporter of beef to net importer of beef during this period (BMEL, 2018). However, the magnitude of its beef trade is low. The beef supply chain has changed during last few years. Figure 1 shows the supply chain in nineties; it shows that the supply chain was more diverse during this time. However, this is no longer the case. The health and animal welfare regulations on one hand and concentration on process and retailer on the other have changed this diversity as special standards and regulation should be followed in the slaughtering process.

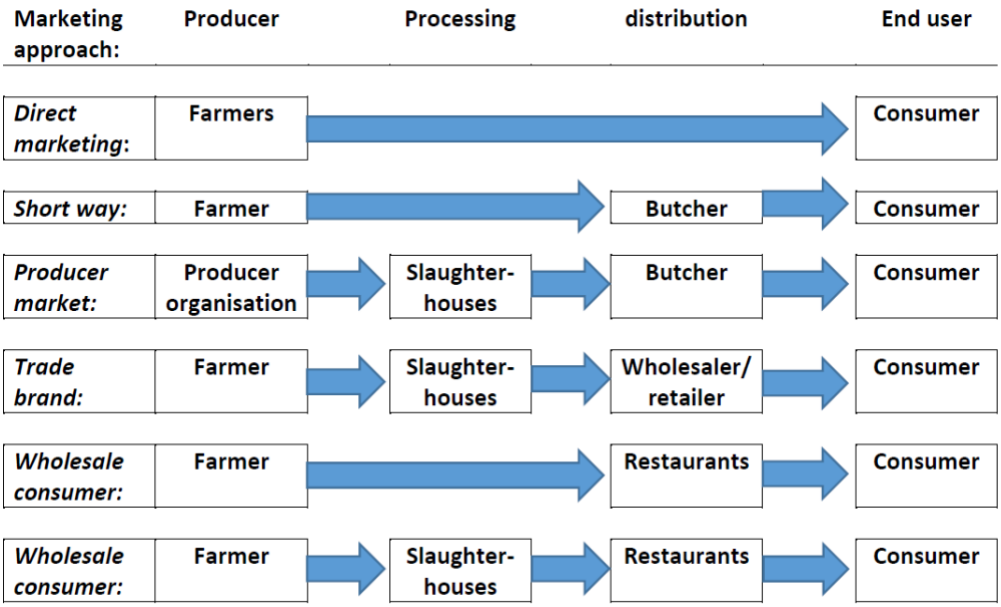

Figure 6-0-1 Meat supply chain in nineties. Source: Wagner & Beimdick (1997)

Figure 6-0-1 shows that direct provision of meat to butchers or restaurants by farmers was the case before which has evolved during last decades. The more recent pattern has changed the above structure. Figure 2 shows an aggregated recent pattern for the supply chain. The role of slaughterhouses and processors are more important in this pattern as special permission is needed for slaughtering. In the next sections, we will see the size of meat processors by concentrated meat processing units.

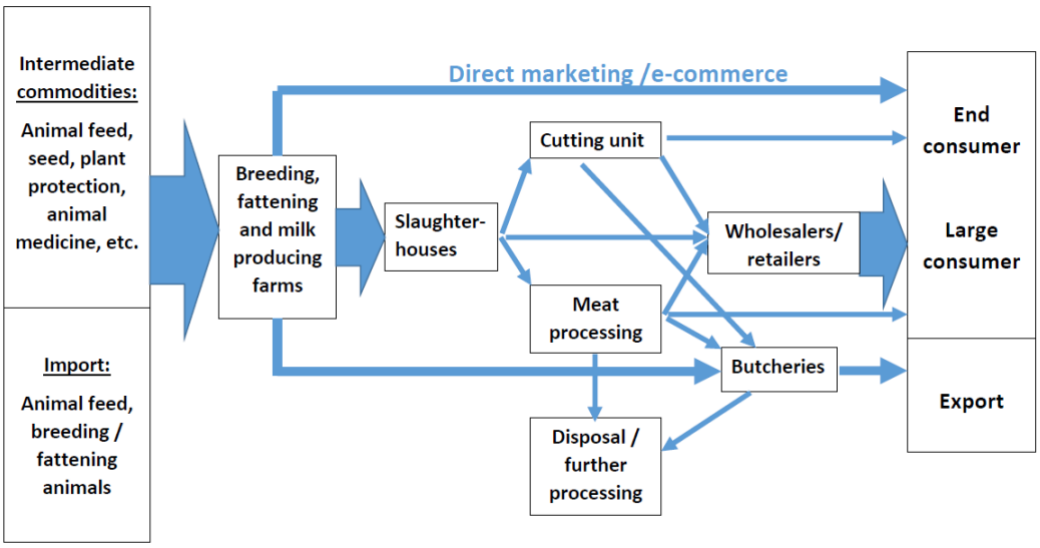

Figure 6-0-2 Aggregated meat the supply chain in recent time. Source: Spiller & Schulze (2008)

Figure 6-0-2 shows that a part of supply chain which presented in Figure 6-0-1 is mainly vanished or reduced. Generally, the processing and slaughtering has concentrated more during last years. Below we will analyse the structure of beef supply chain in Germany systematically. We will start from farms and their structure. Later we look at the meat slaughtering and processing and distribution. Finally, we focus on the structure of the beef supply chain governance in Germany.

6.2 CATTLE FARMS IN GERMANY

Cattle farms (beef and dairy) are unevenly distributed in Germany. Figure 6-0-3 shows the distribution of cattle farms in Germany. As we can recognise from this map, the cattle farms are concentrated in North West and southeast part of the Germany (North Rhein-Westphalia, Niedersachsen and Bayern).

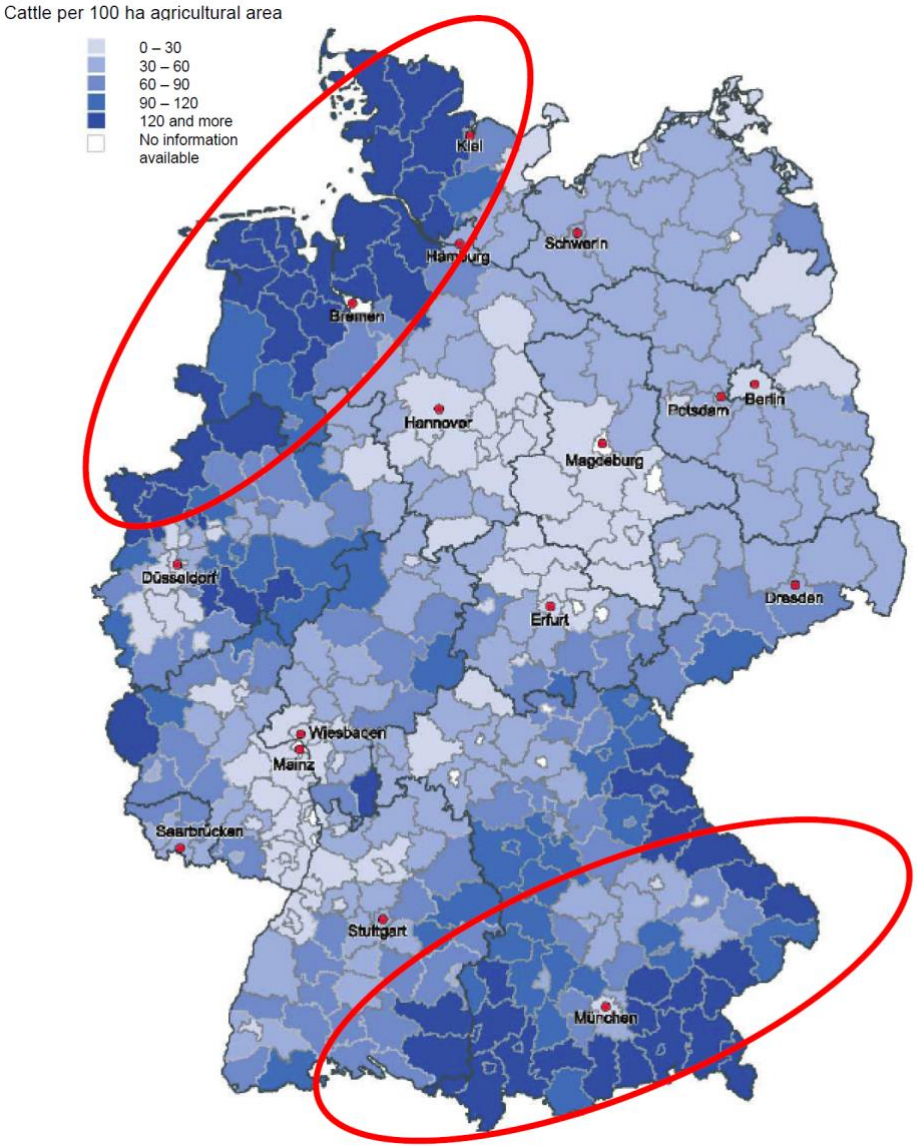

Figure 6-0-3 Cattle concentration in Germany.

Source: Statistische Ämter des Bundes und der Länder (2010)

The latest available data shows an uneven distribution of cattle by farms (Table 6-0-1). More than 73% of the farms have less than 100 cattle and more than 88% of farms have less than 200 cattle. This latter farm group covers less than 50% of cattle (beef and dairy) in Germany. In contrast, less than 12% of farms who have more than 200 cattle cover more than 50% of cattle in Germanys (DESTATIS, 2019). Additionally, the herd size is also unevenly distributed in Germany. Based on the latest available

analysis, the average number of cattle per farm is 87. By focusing only on dairy cows, the average number is 46 per farm. Nevertheless, this distribution is different between former areas of East Germany and West Germany. The latest analysis show that the average size of cattle per farms is much more in East Germany (named 6 new federal states). The average number of cattle per farm is 216 in Brandenburg and 263 in Mecklenburg-Vorpommern.

Table 6-0-1 The cattle farm structure in Germany

	2016				2018			
Herd size	No of farms	%	No of cattle	%	No of farms	%	No of cattle	%
1 - 9	12711	10.51	69568	0.56	34234	24.52	152053	1.27
10 - 19	16307	13.48	231175	1.87	17909	12.83	250811	2.10
20 - 49	28680	23.71	947093	7.67	27558	19.74	901982	7.55
50 - 99	25410	21.01	1817297	14.71	23121	16.56	1649665	13.81
100 - 199	22477	18.58	3186471	25.79	21138	15.14	2998603	25.09
200 - 499	12787	10.57	3700215	29.95	13030	9.33	3810020	31.89
500 and more	2594	2.14	2402221	19.44	2622	1.88	2185958	18.29
Total	120966	100.00	12354040	100.00	139612	100.00	11949092	100.00

Source: DESTATIS (2019)

There are statistics by DBV[53] that show reduction on number of cattle farms till 2016 (DBV, 2014, 2017). However, the statistics of the federal statistical office shows an increase in the number of small farms keeping cattle. In another trend we see slightly reduction on number of cattle (dairy and meat) since 2014 (see Table 1).

6.3 ANIMAL TYPE FOR BEEF PRODUCTION IN GERMANY

By considering all different type of cattle and their uses, dairy cows (4 million cattle) are the major group from 12 million cattle in Germany. The cattle necessary for beef production is provided from different type of fattened cattle. Table 6-0-2 shows the structure of available cattle and their age and use in Germany between 2016-2018.

[53] DBV is the official abbreviation for the German Farmers' Association that is named "Deutscher Bauernverband (DBV)" in German language. More information: https://www.bauernverband.de/information-english

Table 6-0-2 Number of cattle and their age/type structure held in Germany (unit: 1000 cattle).

Type of cattle	Measurement months				
	05/2016	11/2016	05/2017	11/2017	05/2018
Cattle including calves	12563.2	12466.6	12365.5	12281.2	12093.4
Cattle less than 1 year old	3805.0	3794.8	3722.9	3704.2	3617.9
Calves covering less than 8 months	2645.6	2602.6	2562.4	2542.7	2495.1
Young cattle, male, 8-12 months	451.0	464.8	457.3	457.9	442.0
Young cattle, female, 8-12 months	708.3	727.4	703.2	703.6	680.8
Cattle, male, 1-2 year old	962.2	956.0	956.7	932.9	914.6
Cattle, female, 1-2 year old	2020.9	2003.7	1991.7	1971.4	1933.8
Cattle, female, 1-more than 2 year old, for slaughtering	156.9	176.8	164.3	183.7	161.9
Cattle, female, 1-more than 2 year old, for breeding and other uses	1864.1	1826.9	1827.4	1787.7	1771.9
Cattle, 2 year old and older, ox and bull	88.8	88.1	90.1	86.8	90.7
Cattle, 2 year old and older, heifers	729.2	736.7	719.4	726.7	705.9
Cattle, 2 year old and older, heifers for slaughtering	32.1	35.7	32.9	38.5	36.6
Cattle, 2 year old and older, heifers for breeding and other uses	697.1	701.1	686.5	688.2	669.4
Milk cow, 2 year old and older	4272.1	4217.7	4214.3	4199.0	4167.2
Other cows, 2 year old and older	685.0	669.5	670.3	660.2	663.2

Source: DESTATIS (2019)

As we can see in Table 2, dairy cows older than 2 years (4 million) is the major cattle followed by calves less than 8 months (2.5 million). Cattle in Germany which are used for beef production can be categorised to calves, heifer, bulls, oxen and cows. Different procedures are followed for the preparation of each category up to the slaughter time (BZfE, 2019):

- Calves which are not eligible for breeding will be fattened for 5-6 month at the weight of 220-235 kg
- Bulls in intensive fattening approach are fattened until 18 months at the weight of 550-560 kg
- Heifers will be fattened for the period between 13-22 months.

Major dairy cattle breeds in Germany are Holstein, Jersey cattle and Braunvieh. Major beef cattle breeds are Charolais, Limousin, Aberdeen Angus, Hereford and Galloway. Major double use cattle are Fleckvieh (BZfE, 2019). The available data from 2014 by DBV shows that the crossed Holstein-Black Pied breed (5.4 million cattle) is the major dairy cattle breed by number which is followed by double use Fleckvieh cattle breed

with 3.5 million cattle (DBV, 2014). Feed for animals are provided from two different sources (BZfE, 2019):

- The smaller farms are producing animal food from their own farms.
- In intensive animal production, soybean, green beans, cereals, sugarcane or minerals are used. Using hormones as animal feed is not allowed.

6.4 BEEF PRODUCTION, PROCESSING AND DISTRIBUTION

The official statistics show more than 3.5 million cattle are slaughtered annually in Germany. As we can see in Table 6-3, the majority of slaughtering happens in officially registered slaughterhouses and the size of private level slaughtering is very limited. The origin of most slaughtered cattle is Germany. The structure of data in Table 6-3 is in the direction of Figure 6-1 and Figure 6-2 as the concentration on slaughtering and processing has increased in Germany.

Table 6-0-3 Cattle slaughtering in Germany (2014-2017).

Year	Type of animals	Slaughtering by officially registered Slaughterhouses		Slaughtering by households	Total
		Animals with domestic origin	Animals with foreign origin		
2014	Calves	318358	3246	3619	325223
	Beef cattle without calves	3207245	71404	29925	3308574
2015	Calves	319542	314	3660	323516
	Beef cattle without calves	3205597	59545	29678	3294820
2016	Calves	337209	302	2914	340425
	Beef cattle without calves	3226709	63799	25402	3315910
2017	Calves	329028	285	2594	331907
	Beef cattle without calves	3133510	79496	24084	3237090

Source: DESTATIS (2019)

Concentration in the beef industry in Germany is a common phenomenon that can be tested further by other statistics. Table 4 shows that in 2016 from the number of 3.6 million cattle slaughtered in Germany, 2.6 million were done in the top 10 most important companies (more than 70%). Furthermore, the same statistics shows that more than 50% of slaughtering is done in the main four companies. This reflects the concentration in slaughtering and as a result processing and distribution of beef meat to retailers. Vion_food_Group, Westfleisch, Tönnies-Gruppe and MüllerFleisch are the major top 4 meat processing companies in Germany (Table 6-0-4). Additionally, we can see an increase in the size of cattle slaughtering in top 10 companies in Germany

since 2006. One reason for such concentration is regulation on health and animal welfare during slaughtering which cannot be provided by small farms efficiently at the moment. Additionally, animals are not allowed to be moved more than a certain number of kilometers to reach the slaughterhouses. Therefore, the option of farmers on selecting processing unit is not very diverse.

The German beef balance sheet (Table annex) shows that the total meat production of German beef industry was approximately 1.17 million tons (gross weight) equivalent to 1.13 million tons (net weight). The beef production has reduced dramatically in Germany compare to 1991. The net meat production was 2.13 million ton after the German unification. The dramatical reduction in beef production is heavily related to consumption reductions in Germany and lifestyle changes of consumers. This will be discussed in the consumption section.

Table 6-0-4 Major cattle slaughtering organisations (primary processors) in Germany and the size of their cattle slaughtering (unit: 1000 cattle).

Top 10 in 2016	Companies	2006	2009	2012	2013	2015	2016	2017
1	Vion_food_Group			886,92	888	800	800	921
	Moksel	470	442,52					
	SüdfleischHolding	355	248					
2	Westfleisch	273,63	312,19	375,6	372,44	357,8	433,3	481
3	Tönnies-Gruppe	78	300	400	405	424	424	432
4	MüllerFleisch	138	310	330	298	308	300	302
	Gausepohl	265	312	312	255			
	Vion Hamburg (NFZ)	241	189					
5	Bahlmann					160	160	
6	Färber	170	158	158	158	158	156	
7	Teterower Fleisch		100	90	92	109,966	126,96	
	Danish Crown Husum		105					
	Ulmer Fleisch	98						
8	Standard-FleischOL				80	80	82	
	Vosding	75						
9	Steinemann			75		80	75	
	Erlanger Schlachthof			62,83				
10	Uni fleisch			61	62	72,1	70,9	
	Attenberger				55			
	Sum	2163,63	2476,71	2751,35	2665,44	2549,87	2628,16	

Source: AFZ (2007, 2010, 2014, 2017), Hans-Böckler-Stiftung (2017, 2018)
Note: the necessary information was not found for empty cells.

The concentration of beef processing is not limited only to cattle slaughtering (first level process). By looking to the whole meat industry in Germany (pork, chicken and beef), we can recognise an important sector in food industry. Table 6-0-5 shows the size of meat processing industry compared to the whole food industry. The meat processing

industry with 85000 employees and 31.1 billion euro income in 2008 (Situationbericht, 2010) has expanded to 119600 employees and 43 billion euro income in 2017 (Situationbericht, 2018). Table 6-0-5 shows that by considering revenue, the meat processing industry is 24% of food industry and 20% of employees in food industry in 2017. The data shows an annual 4% increase in revenue and 1,2% increase in employment since 2008 in this industry. One reason for this development is more concentration in meat processing industry. It must be added that the top 10 companies which are listed above operate on the full range of slaughtering, processing and packaging. In order to simply identify them, they are named further in this report primary processing companies. This naming identifies them from those processors who are operating on processing and packaging without slaughtering. This latter group of processors are named secondary processors in this report.

6.4.1 Distribution and Retail Stores

More and more processing activity from slaughtering to packing can be carried out by meat processing companies (DVB, 2014). Additionally, many supermarket chains have their own secondary meat processing facilities and organisations.

Table 5 shows that the revenue of food distribution in the retail sector reached the level of 183 billion Euro in Germany in 2017. Edeka group has the first position on this list. Based on the DVB (2016) report, 75% of the retail market of food and non-food item belong to 5 top supermarket chains of Edeka group, REWE group, Schwarz Gruppe (Lidl, Kaufland), Aldi and Metro AG (Real) in Germany. These organisations have developed their own meat processing facilities compartments. Table 6 shows the meat selling revenue of top ten meat secondary processing companies in Germany. These groups are doing the second level processing or even selling of meat. They are mainly part of supermarket chains such as Kaufland Fleischwaren. By considering only meat selling revenue, Kaufland took the first position in 2015. In contrast to the development of a concentrated retail system of meat products, the number of individual butchery shops has reduced from 19580 in 2006 to 13490 in 2017 (see Table 5). This is another index reflecting the concentration of meat distribution in retail sector.

Table 6-0-5 Importance of food retail in Germany.

Year	Revenue Food industry (Billion euro)	Employees in food industry	Revenue meat industry (Billion euro)	Employees in meat industry	Number of butcheries	Revenue of food retail (Billion euro)
2006					19580	
2007	146,8		25,6		19580	157,6
2008	155	534000	31,1	85000	18948	161
2010	149,5	544000	31	83300		166
2011	163,3	550000	37,6	84000		169
2012	169,3	555000	40,5	83200		174
2013	175,2	555300	40,8	105700		180,4
2014	172,2	559800	40,1	106200		186,8
2015	168,6	569200	39,7	106100	14480	191
2016	171,3	580000	41,6	113900	13904	
2017	179,6	595500	43,7	119600	13490	183,5

Source: DBV (2009-2019)

In summary, Table 6-4, Table 6-5 and Table 6-6 show that concentration in German meat processing and distribution has increased. It was not possible to find the detailed information specifically on beef distribution and its volume in different distribution systems. However, as different meat products are distributed in the same way, we can say that the same trend can be defined for pork, chicken and beef on processing and distribution. It must be added that some legal and technical attempts have been initiated to introduce mobile slaughterhouses which follow all rules and regulations in Germany (Land Forscher, 2017). If such initiation become a trend, we may see some tendency back toward Figure 6-1. It means some shorter supply chains between farmers and consumers may become stronger again. However, this is at its primary stages.

Table 6-0-6 Ranking of top 10 meat processing companies in retail chain supermarket (based on meat revenue in stores in million Euros).

Top 10 in 2015	Companies	2005	2006	2008	2009	2011	2012	2013	2015	2016
1	Kaufland Fleischwaren			650.0	650.0	655	655	655	839	NA
2	Edeka Südwest Fleisch	>300.0	>300.0	407.0	417.0	470	585	619	635	643
3	Brandenburg	>400.0	>430.0	430.0	550.5	608	660	640	602	595
4	Bauerngut	351.0	379.6	430.0	414.0	508	552	534	536	550
	FG Frischwaren	~315.0	~324.0							
5	Rasting	249.0	278.7	333.3	378.0	409,9	431,5	452	463	474
6	NORD frische Center	123.0	165.0	234.0	236.0	252	273	280	294	309
7	Süd bayerische Fleischwaren	166.0	180.0	203.0	211.0	238	263	279	292	299
	Birkenhof			245.8	251.3	250	241,9	214,9		
8	Hessengut	125.0	136.0	185.0	188.0	202,5	213	222	225	228
9	Franken-Gut	~200.0	~200.0	242.0	227.0	228	236	232	212	216
10	Rewe Dortmund	140.0	154.0						177	NA

Source: AFZ (2007, 2010, 2014, 2017), Hans-Böckler-Stiftung (2017, 2018)

6.5 BEEF CONSUMPTION AND TRADE

Beef consumption decreased in Germany dramatically between 1991 and 2017. The population of Germany has changed during this period from less than 80 million to more than 82.5 million. However, the average human consumption of beef meat has reduced from 14.11 kg per head to 10 kg per head (see Table Annex). Many factors are assigned to this reduction by different authors. Kanerva (2013) has summarised these factors to a list of political and ideological factors which are common in European Union. Some of the key factors are vegetarianism, health issues, concern on environmental issues, animal welfare, and outbreaks of mad-cow disease (Bovine

spongiform encephalopathy or BSE) in the eighties and nineties in Europe and USA. As a result, meat production has also decreased in Germany. It must be added the self-sufficiency in meat supply in Germany has reduced from an exporter level to almost importer level. There is a trend in the meat consumption data that should be recognised. The meat consumption was decreasing trend till 2014. However, the human beef consumption has increased approximately 1 kg per head since then. The main reason for this trend could be new migrants from Middle East who mainly consume beef and lamb meat. It could be concluded that by the steady increase in the German refugee community from the Middle East, the beef consumption trend will continue to increase in Germany.

The BLZ data in annex shows that the beef trade is a minor part of the German meat industry. The major beef products imported into and exported out of Germany happened inside the EU. The share of EU from total imports of beef products by Germany is 85% and the share of EU from total exports of beef products by Germany is 93% in 2017 (see Table Annex). There are special quotas defined by EU for high quality beef import to European Union from non-EU countries. The High Quality Beef Quota (HQB) or “Hilton” beef, has an annual quota volume of 66,826 tonnes carcase weight equivalent assigned to certain countries. This quota is not regularly filled fully. Additionally, premium beef from the global market also enters the EU under the autonomous beef quota, sometimes referred to as the “EU 481 grain fed quota”. This covers grain fed beef imported from the global market by the EU and is now set at 45,000 tonnes product weight for 2017/2018. It is regularly filled, helped by the fact that no import tariffs are payable (AHDB, 2018). The EU data shows that Germany has imported approximately 6000 tons of boneless meat from non-EU countries which is mainly fell in the above quote categories (European Commission, 2019).

6.6 BEEF QUALITY GRADING AND STEAK IMPORTANCE IN GERMANY

The discussion on the quality of beef is less of importance in German society compared to Anglo-Saxon culture, South American countries such as Argentina, or in Japan. The public discussion on the quality of minced meat (Hackfleisch in German language) which is much cheaper than steak is more important in German society. This phenomena is even captured by journalists (Melican, 2014). However, if we focus on meat quality, two different labelling are recognizable by official authorities on beef quality. One is for carcass quality classification that is in line with EU framework and the other is the labelling of the product which is in line with EU and German regulation. In the carcass quality classification which is based on European Economic Community regulations (EEC) No. 1208/81 and No. 2930/81, the following attributes are of interest (Fleischprüfring Bayern e.V., 2019):

- The shape and development of the carcass, which is denoted by the letters E, U, R, O, P with E being the best and P the poorest;
- The degree of fat is denoted by the numbers 1, 2, 3, 4, 5 in order of increasing fatness;

- Sex category: denoted by the letters A (young bull), B (bull), C (steer), D (cow) and E (heifer).

This information is not necessarily on the final product. The final product which is based on German labelling law and EU regulations Nr. 1760/2000 and Nr. 1825/2000 should have a label which reflects the information on the origin of the meat, especially about the place of birth, the fattening, the slaughter and the composition. As it is mentioned, the classification information should not be on this label necessarily (BLE, 2019).

There are not accurate statistics available on steak consumption and public demand for different types of it in Germany and their relation to the classification mentioned above. As mentioned above, this is less an issue of discussion in Germany compared to a commodity such as beer. The only available information through meat marketing sources are on the quality and type of cuts. The main five different cuts can be recognized from these sources. Figure 4 shows the different parts of a cattle which can be used for meat products. In Germany, steak is prepared from specific parts which are listed below (MAREDO, 2019; Rasting, 2019):

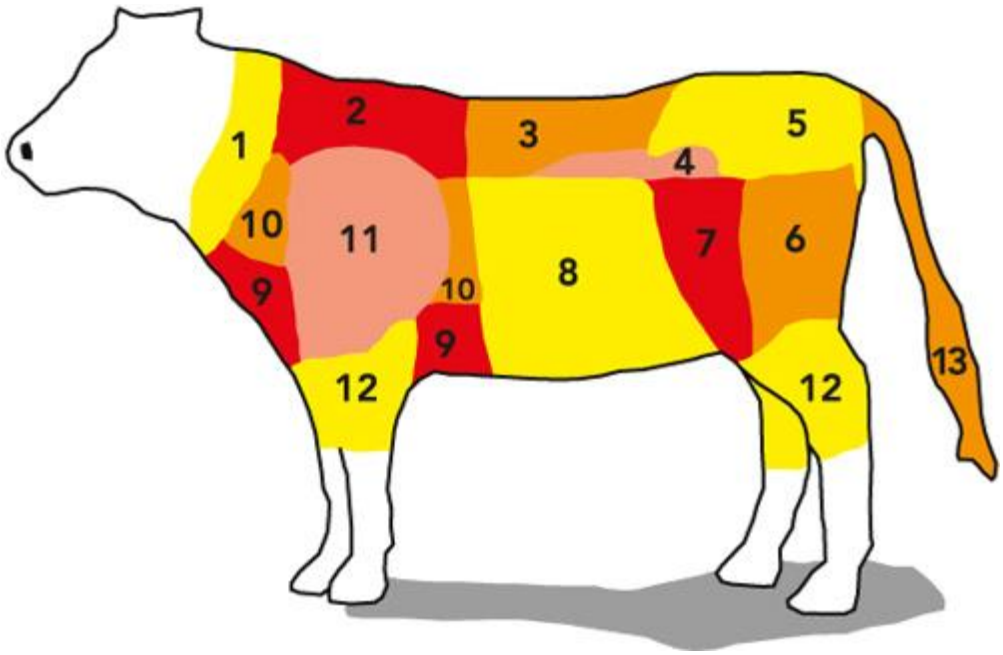

Figure 6-0-4 : Parts of the cattle used for meat products

Source: Rasting (2019)

Part 3. Sirloin which is named as “Hochrippe” or “Roastbeef” in German language is used for classical steak.

Part 4. Beef tenderloin which is named as “Filet” in German language is used for classical steak of weight 200g for one or Chateaubriand steak for 2 people with 400 g weight

Part 5. Round cut which is topside and silverside is called “Hüfte/Blume” in German and it is used for Roulade and beef steaks

Part 6. Thick flank which is named “Unter- und Oberschale” in German language and it is used for different products and steak is one of them.

Part 7. Bottom meat that is called “Kugel” in German is used for roasting, roulade, tartare and steak.

From the list above, sirloin (No 3) and tenderloin (No.4) are the most expensive ones which are available in the market and loved by consumers (Fleischexperten, 2010). As it is mentioned before, the public discussion on steak in Germany is much less than Anglo-Saxon culture. Therefore, we cannot provide a concrete objective evidence on the future of steak consumption in Germany.

6.7 BEEF SUPPLY CHAIN GOVERNANCE

Following the Gereffi et al. (2005) model, we present a picture of the beef supply chain governance in Germany for major parts of the chain based on data acquired. As we have seen from the data above, the main non-concentrated part of chain is the cattle farmers. Approximately 140 thousand cattle farmers sell their animals to major slaughterhouses which are owned mainly by 10 companies in Germany. These companies use more or less the whole cattle and they do not waste much. It means that food and non-food meat products are produced by primary processing companies. Farmers sell their livestock to the processing companies. This relation can be based on contracts with farmer cooperatives, contract with farmers or direct selling. In all cases, we see that the advantage is with processing companies and they can even contact farmers to produce livestock on special characters of interest. The relation between farmers and processors is more in the category of captive (or modular) structure. We have named this part as 1st pillar in Figure 5. However, this relation is different in the other parts of the beef supply chain that we named it as 2nd pillar. In second pillar, the following relations are recognisable:

- Primary meat processors and retail submarket chains (dynamic relational/modular relation).
- Primary meat processors and secondary meat processors (dynamic relational/modular relation).
- Secondary meat processors and retail supermarket chains (dynamic relational/modular relation).

As we have seen before, the number of actors are limited in this part of the chain and it is difficult to find a lead firm there. Therefore, we consider a sort of dynamic relational / modular relation between these actors.

The minor issue in the chain is the relation between approximately 13000 butchers and meat processors (primary and secondary). We can say that if meat should be provided to the butchers from primary and secondary processors, a sort of free market is available between actors. There are also some entities available that primary or secondary processors (usually at smaller scale) have their own butchery shops for retail distribution. In this case, we have a hierarchical relation between processors and butchers (see Figure 6-0-5)[54].

[54] Dietzel is an example of such a vertically integrated meat supply chain. Further review: https://www.dietzel-fleisch.de/

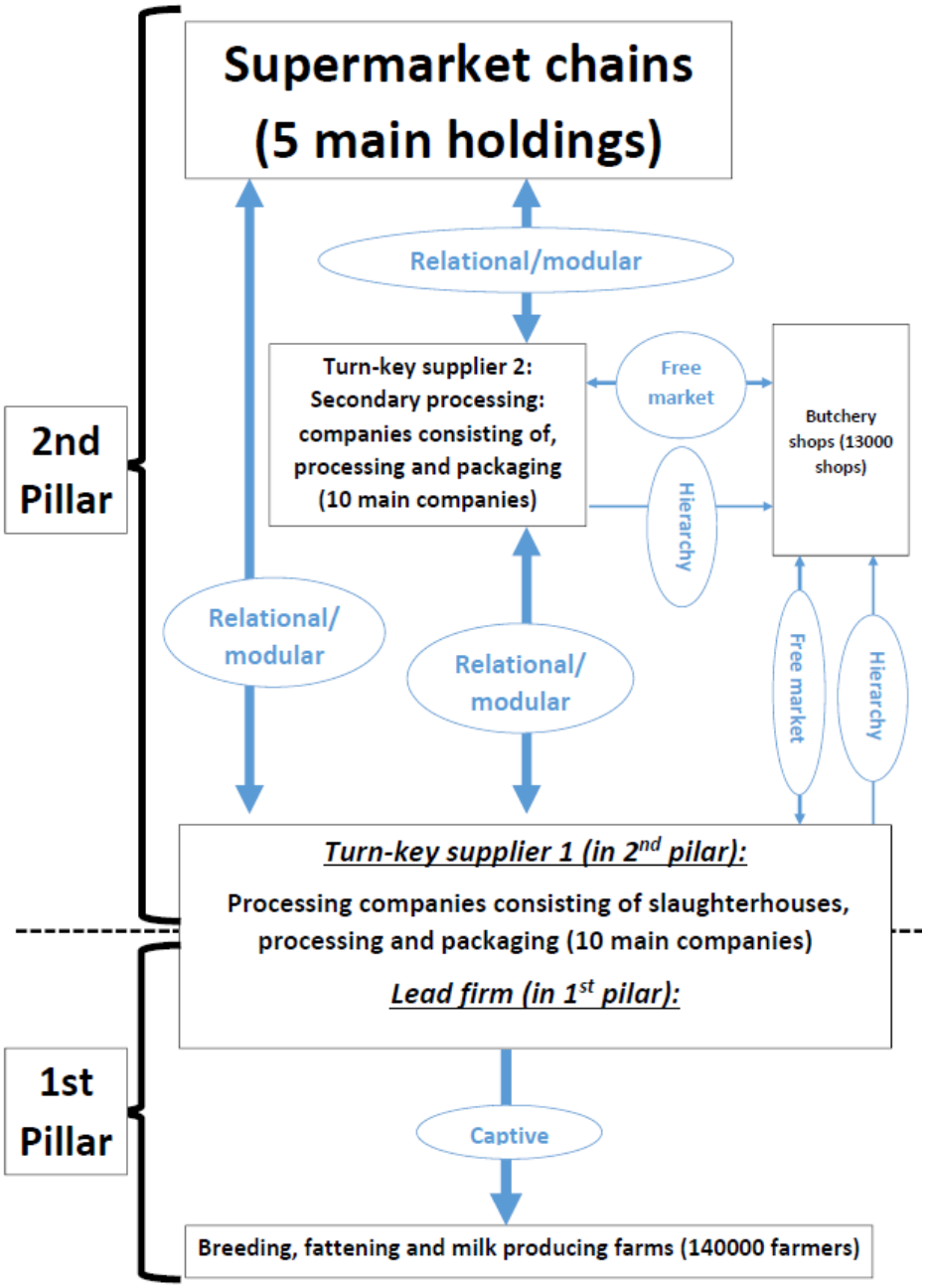

Figure 6-0-5 Governance model of German beef value chain. Source: the author.
Note: Arrows indicate codified informational flows rather than direction of product through the value chain.

6.8 CONCLUSION

In this report, we have studied the structure of governance in the German beef supply chain. The focus of this report was not the niche markets such as the halal meat supply chain or ecological products, but the conventional beef products in Germany. As we have seen in this report, a concentration on meat processing (primary and secondary) and retail supermarket chains is recognisable. This is the similar trend that we can recognise in different parts of the world in food supply chains (Sexton & Xia, 2018). As we have presented, beef consumption has reduced dramatically in Germany and the

possibility that this reduction will be recovered in the future is low. Therefore, concentration in the supply chain and reduction or stability of the consumption level are two key aspects of the beef supply chain in Germany. The beef production is not as controlled as milk by producers' cooperatives and the role of cooperatives is much less in this chain. The structure of supply chain in Germany was much more diverse in the past as the health and animal welfare issue were not on the agenda. By strengthening the legal aspects of those issues, the concentration in the supply chain has increased, which reduced the diversified structure of nineties. However, any possible technological innovation on promoting local slaughtering could diversify the chain again. Another issue that can affect the concentration are interest on local product consumption. The results of GfK[55] shows an increase in regional product consumption (DBV, 2015) which is not in the direction of concentration. Additionally, increase in the consumption of halal meat and ecological products are two additional things which can have some effect on concentration. However, it is possible that big primary and secondary processors will focus on these markets and overtake those niche markets as the trend is recognisable.

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Annex 6-1: Beef balance sheet in Germany (Unit: 1000 ton dead weight).

Year	Gross production	Live animal		Nett production	Meat products trade				Total consumption		Human consumption		Self-sufficiency ratio %	German population
		Import	Export		Total import	EU share	Total export	EU share	Total	kg/head	Total	kg/head		
1991	2273,14	25,33	164,05	2134,43	396,36	242,07	956,30	442,98	1645,12	20,57	1128,55	14,11	138,17	79,97
1995	1541,43	27,60	161,24	1407,79	386,10	280,41	440,72	262,38	1357,48	16,70	931,23	11,45	113,55	81,31
1999	1447,71	23,08	96,38	1374,41	285,60	202,93	547,96	325,38	1242,81	15,26	852,57	10,47	116,49	81,42
2000	1369,36	21,95	87,78	1303,54	274,38	195,87	452,90	339,43	1148,41	14,10	787,81	9,67	119,24	81,46
2001	1402,75	12,25	53,54	1361,46	176,61	127,19	653,43	407,34	818,39	10,04	561,42	6,89	171,40	81,52
2002	1384,58	13,23	81,59	1316,23	248,34	172,74	591,51	425,62	987,79	12,11	677,62	8,31	140,17	81,58
2003	1296,17	18,43	88,37	1226,24	283,48	200,26	530,96	444,06	1030,77	12,64	707,11	8,67	125,75	81,55
2004	1348,81	16,24	101,89	1263,16	267,94	186,61	510,88	435,41	1020,33	12,53	699,95	8,59	132,19	81,46
2005	1216,04	17,72	66,86	1166,90	283,43	193,02	456,34	407,84	993,99	12,22	681,88	8,38	122,34	81,34
2006	1234,79	20,75	62,73	1192,81	302,70	224,31	516,03	468,68	979,48	12,07	671,92	8,28	126,07	81,17
2007	1208,00	28,66	50,93	1185,72	362,29	267,15	502,80	475,31	1045,21	12,91	717,02	8,85	115,57	80,99
2008	1219,88	21,35	41,79	1199,44	361,02	290,86	553,27	513,58	1007,19	12,47	690,93	8,55	121,12	80,76
2009	1216,22	21,44	48,04	1189,62	380,22	300,67	546,19	525,87	1023,64	12,72	702,22	8,73	118,81	80,48
2010	1226,43	29,34	50,77	1205,00	409,94	332,31	569,93	508,55	1045,01	13,02	716,88	8,93	117,36	80,28
2011	1200,76	24,20	54,40	1170,56	448,76	375,08	544,49	478,92	1074,83	13,40	737,33	9,19	111,72	80,23
2012	1163,08	23,07	39,90	1146,26	407,76	344,19	487,83	451,96	1066,18	13,26	731,40	9,10	109,09	80,40
2013	1135,64	23,31	41,36	1117,60	403,09	338,01	464,78	432,38	1055,90	13,10	724,35	8,99	107,55	80,59
2014	1180,57	14,17	52,14	1142,60	414,90	355,96	482,59	445,03	1074,91	13,28	737,39	9,11	109,83	80,93
2015	1183,00	16,80	57,02	1142,78	453,24	393,79	463,44	426,49	1132,59	13,90	776,96	9,54	104,45	81,46
2016	1196,00	17,51	58,03	1155,48	470,12	408,18	455,76	422,90	1169,85	14,21	802,51	9,75	102,24	82,35
2017	1173,34	20,50	65,09	1128,75	510,06	438,07	433,20	401,15	1205,61	14,58	827,05	10,00	97,32	82,67

Source: BZL (2019)

7. GOVERNANCE OF THE FARMED SALMON VALUE CHAIN FROM NORWAY

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7.1 SUMMARY

This work is part of Task 5.1 with the objective to analyse modes of governance in the salmon value chain and the impact of policies on the performance of value chains. Governance of food value chains focuses upon inter-firm relationships and the information asymmetries and power relations between the firms (including unfair trading practices) and how this impacts upon the distribution of value along the chain.

7.1.1 METHODS

The information gathered and analyses in this report are based on existing literature and reports from organisations, industry and media sources, as well as interviews with stakeholders. A governance framework for global value chains according to Gereffi *et al*. (2005)[56], was applied to identify the characteristics of the governance forms along a buyer-supplier power continuum from farming to final product in retail. A focus is on identifying practices and structural elements where fairness is or could be an issue. Six interviews were conducted with business experts from Norway, UK and Iceland in the salmon chain according to a semi structured interview guideline. The interviews lasted for approx. one hour, they were recorded, transcribed and anonymised and further input has been gained from discussions with stakeholders in workshops conferences and via teleconferences.

7.1.2 OUTCOME

The first part of the report is a general description of global salmon aquaculture production and key actors. This is followed by an overview of the salmon chain case study and the regulatory framework and industry initiatives to establish and implement standards. In part three is the governance analysis of the salmon value chain according to the GVC governance framework to identify the characteristic relationships between the different actors in the chain. The governance structure has been evaluated in terms of inter-firm relationships, information asymmetries, price negotiations and power relations between the firms.

[56] Gereffi, G. Humphrey, J and Sturgeon, T (2005), The governance of global value chains. Review of International Political Economy 12:1, 78-104

7.1.3 KEY HIGHLIGHTS

Contrary to agriculture farms who have a weak position in the value chain and are susceptible to being captive suppliers, the large integrated salmon aquaculture companies are competing on the global market.

- The salmon value chain is a producer driven global value chain. Currently the demand is more than supply and trade is favourable for the aquaculture producers. The large vertically integrated aquaculture companies have the power in the chain and a strong bargaining power against the supermarkets, who are the lead firms in the value chain

Producers have invested in technological and production competencies according to technical standards as part of the regulatory framework and industry initiatives. Standards and auditing is a whole business by itself and way above the regulatory requirements

- The voluntary standards initiated by the producers like ASC (Aquaculture Stewardship Council), Global GAP and / or Best Aquaculture Practices (BAP) are a requirement to gain access to market. Furthermore, the primary and secondary processors are generally certified according to best manufacturing practices standards, implying that processing criteria, packaging and handling practices can be codified according to HACCP principles and food safety standard.

Large companies are favoured by the retailers because of stable supplies and lower transaction cost. While salmon has mainly been a commodity, producers are focusing on value added products, branding and differentiating their products on the market. The trend is from fresh whole salmon to fresh boneless cuts, convenience food and ready to eat.

- The governance structure has developed over time from market to hierarchies where the organization of transactions and asset specificity has been influenced by structural changes, including horizontal and vertical integration as well as the concentration of supermarkets.
- Structural changes and consolidation of aquaculture companies has reduced the number of farming companies and has helped companies take advantage of economies of scale and strengthened their position on global markets
- The inter-firm relations of producers and their buyers is characterized by free market exchanges where products are sold on spot market, however there is a trend of long term contracts in particular between large integrated companies and retail or large secondary processors.
- Secondary producers are stuck in the middle in the value chain and have a weak bargaining position against retailers who operate with fixed margins. When spot market is high the secondary producers and traders may suffer
- The salmon chain governance structure is best described as “Hybrid” where the governance and inter-firm relationships are characterized by a range of forms from markets to hierarchy, where modular, relational and captive structures can be identified depending on the different size of the companies and whether they are vertically integrated.

Salmon price has historically been very volatile similar as other food commodity, which is influenced by biological uncertainties. These have an impact on stocks of available of biomass and thus put constrains on stable supplies and consequently influence the price.

- High salmon prices have been explained by increased cost of production, however there are ongoing investigations on potential price coordination in order to sustain and possibly increase prices of Norwegian Atlantic salmon.

Key uncertainties within the salmon farming sector industry are regarding biomass development (production growth) and future prices. Combined with long production cycles, these uncertainties represent a large challenge for the salmon producers including additional cost of preventive measures and mitigation in the case of the occurrence of salmon lice, diseases, and escape. The challenges related to sea lice have been the main cause for the increase in cost per kg over the last few years and recently algal bloom has caused serious problems in Norway.

Environmental impacts of aquaculture are reflected in the regulatory framework which focus on aquaculture licenses and maximum allowable biomass to ensure the sustainable growth of the sector.

- The growth of the sector is limited by the regulatory constrains linked to concerns because of the occurrence of sea lice and potential environmental risks associated with sea cages. Future plans are focused on land based operations or further off shore closed cages.
- Licenses with a focus on environmental issues have been the main content of aquaculture regulations where companies have been addressing the biological challenges through uptake of standards like ASC and reporting on corporate social responsibility (CSR). CSR address the issues of sustainability largely as a branding exercise for the purposes of attracting and retaining customers and gaining trust from consumers
- There is a lack of considerations of social impacts and in particular further research should be focused on the broader aspects of sustainability, namely “social license to operate” which is concerned with the acceptability of socio-economic, socio-cultural and environmental impacts in a local context.

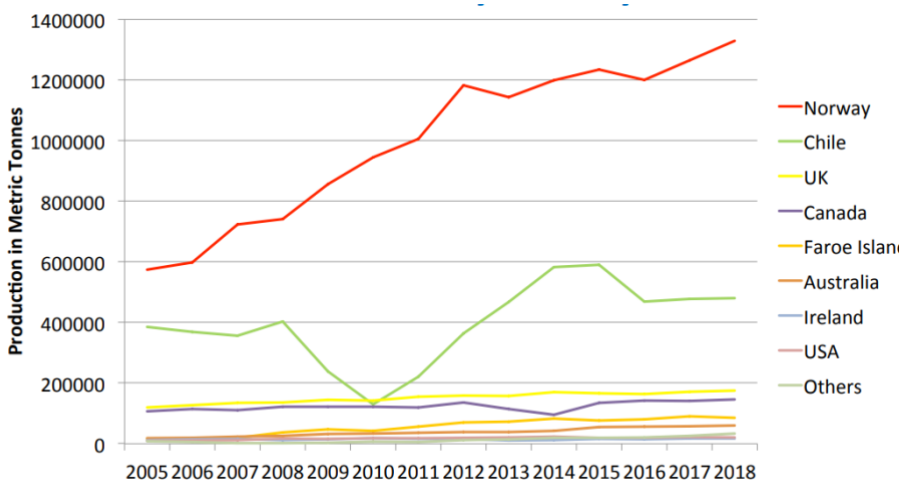
7.2 OVERVIEW OF THE SALMON VALUE CHAIN

Aquaculture has been the world´s fastest growing food production technology and various conditions are favouring increase in aquaculture production. The population growth and economic growth have led to increased demand for seafood. Aquaculture has become an important source of seafood to compensate for the stagnating global catches of fish and limited supply of wild fish. The globalization of food trade has reduced the cost of shipping products and the concentration in retail favours competitive supply chains with the ability to control stable supplies and efficient logistics.

Norwegian aquaculture industry has been leading the global salmon market and competing on the world market for seafood. The success of salmon farming in Norway in terms of innovation and industrial development is based on a close co-operation between industry players, governmental bodies and (applied) research institutes which then contribute to local or national clusters. The shared responsibility of all three parties as fellow players in the industrial development has motivated 'Government' and 'Academia' to move from passive facilitators and premise providers to being active partners in regional development processes. The Norwegian industry fund joint applied research by a compulsory levy on sales value to secure applied research into marine aquaculture. This is additional to financing market research and generic marketing issues through Seafood Norway, also funded entirely by a levy on seafood export.

7.2.1 SALMON PRODUCERS

Norway exported 1 million tonnes of salmon in 2017 at the highest value ever for salmon which was an increase of 5 per cent compared with 2016 in value and 2.8 per cent more in volume than 2016 (NSC, 2016)[57]. Other main producing countries of Atlantic Salmon are Chile, UK, Canada, Faroe Islands, Australia, Ireland and US (Figure 7-0-1).



Source: Kontali

Figure 7-0-1 Atlantic Salmon production by country (From Tveterås, 2016) [58]

[57] Norwegian Seafood Council https://en.seafood.no/news-and-media/news-archive/salmon-exports-valued-at-nok-64.7-billion-in-2017/

[58] Tveterås, R. (2016), Global Fish Production Data & Analysis, Global outlook for aquaculture leadership, Guangzhou, China https://www.aquaculturealliance.org/wp-content/uploads/2017/06/Day1_RagnarTveteras.pdf

- *In all the main salmon producing countries there has been a common trend in "structural changes over the years with consolidation achieved through a number of mergers and takeovers. This has reduced the number of companies operating within the sector in each country. Consolidation of the sector has also helped companies take advantage of economies of scale and strengthened their position on global markets. A few large Norwegian companies are multinational salmon aquaculture corporations that also conduct business in both Scotland and Canada. One large Canadian company operating salmon facilities in all Atlantic Provinces also conducts aquaculture activities in Scotland, as well as in Chile, Spain and the United States (Maine). These large salmon aquaculture companies are all vertically integrated with hatcheries, grow-out sites, feed mills, processing facilities, and marketing operations."(POFO, 2016)*[59].

The top four of world's largest Salmon producers are Norwegian enterprises (MOWI, Lerøy Seafood ASA, Cermaq Norway and SalMar Farming AS). Marine Harvest (MOWI)[60] is by far the largest salmon producer worldwide (slaughter volume in 2016 of 380,621 metric tons). Norway and Chile dominate the overview of the world's 20 largest salmon producers (Table 7-0-1)[61]. Of the twenty largest, eleven companies have their head office in Norway, six in Chile, while the United Kingdom (Scottish Salmon Company), the Faroe Islands (Bakkafrost p/l) and Canada have one each. In 2016 the largest non-Norwegian producer was Cooke Aquaculture in New Brunswick, Canada, with 77,000 metric tons.[61]

Table 7-0-1 . Overview of the world's 20 largest salmon producers (Source: OSE, 2019; salmonbusiness.com 2016)

Company	Country	Listed on Oslo Stock Exchange	Harvest quantity 2017 (Source: Marine Harvest Industry Handbook 2018)
MOWI Marine Harvest	NO	1 July 1997	210.200 (NO) 60.200 (UK) 39.400 (Can) 44.900 (Chile)
Lerøy Seafood ASA	NO	3 June 2002	132.000
Cermaq Norway	NO		48.000 (NO) 21.000 (NAm) 54.000 (Chile)
SalMar Farming AS	NO	8 May 2007	135.200 (NO)
Cooke Aquaculture	Canada		57.000 (Can) 20.000(UK)
Grieg Seafood ASA	NO	June 2007	40.900 (NO) 12.100 (UK) 9.600 (NAm)
Multiexport	Chile		58.700
Bakkafrost p/l	FI	March 2010	
Nordlaks	NO		40.000
AquaChile	Chile		43.300
Nova Sea AS	NO		40.700
Pesquera Los Fjordos	Chile		41.000
Alsaker Fjordbruk	NO		25.000
Salmones Camanchaca	Chile	Feb 2018	30.800
Australis Seafoods	Chile		39.100
SinkaBerg-Hansen	NO		
Blumar	Chile		27.000
Norway Royal Salmon ASA	NO	March 2011	31.900
Bremnes Seashore	NO		24.000

[59] POFO (2016). Volume two – Aquaculture Industry and Governance in Norway and Scotland, June 2016. Ch.3 Comparative analysis of Canadian, Scottish and Norwegian aquaculture https://sencanada.ca/content/sen/committee/421/POFO/reports/2016-06-22_POFO_AquacultureVolume2_Final_E.pdf

[60] Marine Harvest ASA: New company name "Mowi ASA" registered Jan 2, 2019

[61] http://salmonbusiness.com/ largest these-are-the-worlds-20- -salmon-producers/

Scottish Salmon Company	UK	April 2011	25.300

The large majority of products from Norwegian salmon farmers (and other producing areas/countries) are in a commodity format and standardized according to technical standards for the production as required by national regulations and industry standards. Global demand for salmon is bigger than supply, hence there are good margins for primary producers.

A further growth is expected to have positive effects to coastal areas of Norway as well as substantial positive economic ripple effects through resource rent fee paid for new licenses and income tax from industry and employees.

The price of farmed salmon and increased demand has been the main driver of the revenue growth for aquaculture companies and this has had a spill-over effect to other companies working in the aquaculture industry (E&Y, 2017).

7.2.2 COMPONENT AND MATERIAL SUPPLIERS

Various companies providing technical solutions for the aquaculture industry have been growing along with the high price of salmon and increased earnings of the production companies. They have focused on improved aquaculture technologies to mitigate the biological challenges and the general increase in production cost. The largest companies among producers of technical solutions and services for the aquaculture industry e.g., barges, wellboats, feeding systems, cages, mooring systems, sea lice treatments and software are Steinsvik AS, Akva Group ASA, Aas Mek Verksted AS, Optimar AS and Egersund Net AS (E&Y,2017)[75]. Other top equipment developers are e.g. Aqualine a supplier of net cage systems and Aquaoptima a supplier of RAS (recirculating aquaculture systems).

7.2.3 FEED PRODUCERS

During the last decade, the salmon feed industry has become increasingly consolidated. Since 2008, three feed producers have controlled the majority of the salmon feed output; Skretting (subsidiary of Nutreco which has been acquired by SHV), Ewos and BioMar (subsidiary of Schouw). Moreover, the large vertically integrated companies have established their own feed plants for example MOWI. The companies all operate globally. The top five feed producing companies are Ewos AS, Skretting AS, BioMar AS, Marine Harvest Fish Feed AS and Aker Biomarine Antarctic AS (E&Y, 2017)[75].

7.2.4 MARKETS

The EU fish supply mostly relies on extra-EU imports and EU is the largest import market for salmon products globally (EUMOFA, 2017)[72]. Salmon is the first species traded on the European market of fish and seafood products in terms of value and the third species consumed (after tuna and cod). France is the largest consumption market for salmon in the EU. The salmon supply from Norway is imported mostly as fresh products (fresh/chilled whole (ca. 74%) and fresh/chilled fillets (15%)). Imported salmon from the UK is mostly fresh/chilled whole (83%), while salmon from Chile is almost entirely imported as frozen fillets (97%). Salmon from the rest of the world is imported as fresh/chilled whole (33%), frozen fillets (25%) and smoked (23%)

(Pyanchenkova, 2017)[62]. Growth in demand of fresh salmon in the consumer market can be explained by the overall trend as exemplified by French consumers who mostly consider salmon to be more suitable for weekday home occasions. This means that salmon is becoming a central part of the regular diet, which clearly contributes to the growth of salmon demand that, in turn, may influence the increase of salmon prices (Pyanchenkova, 2017)[62]. In the EU, around 70% of the Atlantic salmon supply went to retailers and approximately the same share was sold fresh. Of the different products, fillets have the largest market share of 45% followed by smoked (30%). Other VAP (15%) consists of all value added processed products, except smoked salmon[63]

In 2016 apparent consumption of fishery and aquaculture products in EU amounted to 12,41 million tonnes increasing by 4% compared with 2013. This corresponds to 24.33 kg per capita, of which salmon 2,19 kg per capita (5% wild, 95% farmed) (EUMOFA, 2017).

7.2.5 STAGNATING GROWTH – VALUE ADDED PRODUCTS

The growth in aquaculture production has been limited, which is mainly caused by biological constraints where the sea lice problem is preventing new licenses. Consequently, producers are focusing on optimum growth and further to integrate downward in the chain to produce value added products, branding and differentiating their products on the market. The trend is from fresh whole salmon to fresh boneless cuts, convenience food and ready to eat. Filleting of salmon has become an industrial segment as seen by the increase in filleting lines deliveries to processing companies in Europe and elsewhere.

7.3 SALMON VALUE CHAIN STRUCTURE AND GLOBAL VALUE CHAIN GOVERNANCE MODEL

The VALUMICS case study “salmon to fillets” focuses on salmon farmed and processed in Norway into head on gutted salmon and fillets and distributed to secondary processors and retail markets in EU. In the analysis we have involved stakeholders from the salmon aquaculture in the UK and Iceland as well as from Norway. The largest salmon producers in the UK as well as in Iceland are almost all owned or partly owned by Norwegian companies.

7.3.1 STRUCTURAL CHANGES – MERGERS

The structure of the industry has changed over time, from an owner-operated industry of several hundred small single farm firms to a more integrated industry of fewer but larger firms (Kvaløy and Tveteras 2008)[64]. In the mid-80s, the industry consisted of more than 800 companies. Structural change started during a 'market collapse' in the early 90s. This led to bankruptcy of many small farms (mostly small players) and the

[62] Pyanchenkova, Y. (2017). Analysis of import demand and consumption of salmon in France – Discovering the reasons behind the increasing salmon prices. MS thesis, The Arctic University of Norway, 78p

[63] Marine Harvest(2018) Salmon Industry Handbook http://marineharvest.no/globalassets/investors/handbook/2018-salmon-industry-handbook.pdf

[64] Kvaløy, O., & Tveterås, R. (2008). Cost Structure and Vertical Integration between Farming and Processing. Journal of Agricultural Economics, 59(2), 296–311. doi:10.1111/j.1477-9552.2007.00149.x

Norwegian Government deregulated strict rules for ownership and regulation preventing licenses as 'assets pledged as security'. This gave ground for new players who could finance buy-out of farms and then use the license documents to secure the depts.

By 2008 the number of active firms had fallen to 186, with the four largest accounting for almost 50% of Norwegian production (Asche and Bjørndal 2011)[65]. This change was driven by increased operating capital requirements and the search for economies of scale and scope in production and sales. Larger companies then influence smaller players by being the driving force of structural change within the industry. This has influenced the development of the global aquaculture industry by facilitating knowledge transfer with respect to aquaculture technologies, uptake of standards and access to market.

- "*The large companies come in as buyers when small family business withdraw from business. The result is structural change – fewer players – but contrary to the situation in the early 90ties, these have been based on voluntary, normal merges and acquisitions." (Norwegian salmon business expert, Feb 2019).*

7.3.1.1 Aquaculture salmon producers

Producers in the value chain are those that produce juveniles (smolt) (hatchery, land-based activity) and those that grow the smolt to market size (ongrowers, sea-based activity). Many producing companies do both. There has also been a rise in large *vertically integrated companies* with direct ownership of production activities including hatcheries, fish processing and exporting. In Norway, large producers own the slaughtering facilities including the well boats for fish transport and the primary processing, while the small producers do not have facilities for the slaughtering and primary processing. Small farmers often use/rent or buy slaughtering services from other companies. The optimal harvest weight is between 4-5 Kg although fish are commonly marketed in the range between 3.5 and 7 kg. Volatile salmon prices make the timing of harvest an important factor for profitability and hence the farmer has to decide whether to harvest the fish at a current known price or keep them until a later harvest and market larger fish at an unknown future price (Guttormsen et al. 2004)[66]. However, delaying harvest comes at a price, as this incurs feed and monitoring costs (Denstad et al., 2015)[67].

Primary processing involves gutting, chilling and packaging. By-products such as guts, heads, tailbones and other fractions from slaughtering are further processed into fish oil and fish meal. The fish meal is mainly exported as a fish feed ingredient for Mediterranean species while fish oil is used both as a fish feed ingredient and as human health supplement (Richardsen, 2017)[68]

[65] Asche, F., and Bjørndal T., (2011). The Economics of Salmon Aquaculture, 2nd Edition. London: Wiley-Blackwell.

[66] Guttormsen et al., 2004. The Value of Information in Salmon Farming: Harvesting the Right Fish to the Right Time, Aquaculture Economics and Management 10 (3).

[67] Denstad, A. G. , Lillevand, M., Ulsund, E.A. (2015). Production planning and sales allocation. in the salmon farming industry Norwegian University of Science and Technology

[68] Richardsen, R. (2017), Analyse marint restråstoff, 2016, SINTEF Ocean AS

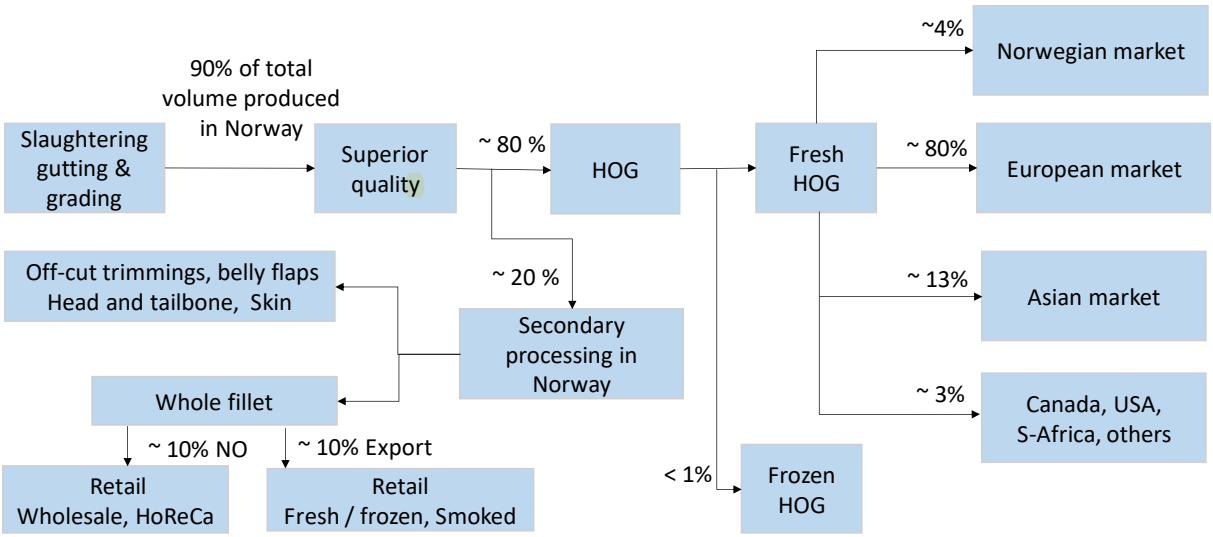


Figure 7-0-2 Flowchart of farmed Atlantic salmon showing the supply chain from slaughter in Norway, primary processing of superior quality HOG (head on gutted) and distribution of the main products to different markets (SINTEF).

About 95% of salmon produced in Norway is exported (E&Y, 2017). Norway is the main source of EU fish-product imports (about 60% in 2015). These imports mainly consist of fresh whole products originating from Norway, and entering into the EU through Member States that act as "trade routes", namely Sweden and Denmark.

Out of total production in Norway, some 80% is exported as whole HOG (head on gutted) mostly fresh but also frozen (Figure 7-0-2). The fresh chilled HOG salmon is typically transported in styrofoam boxes (EPS) by trucks from Norway to secondary processors and wholesale / retail markets in Europe (80%), and to Asia (13%) and other markets where fresh products are mostly transported by airfreight (Figure 7-0-2). The largest markets for Norwegian salmon in 2017 were Poland, France and Denmark which are the hub markets that re-export Norwegian salmon to other countries within EU (EUMOFA, 2017)[69]. Poland is the largest market (18%) followed by France (13%), Denmark (12%), Spain (9%), UK (8%), The Netherlands (8%), Italy (7%) and 25% to other countries e.g. Germany and US. Trade barriers to the EU are a particular disadvantage for Norway compared to other competing salmon producing countries. For example, UK and Ireland are currently members of the European Union, however after BREXIT the landscape for UK will change. The other countries such as Chile, the Faeroe Islands and Canada have the advantage of having negotiated free trade agreements with important markets such as the USA and EU (MFCA, 2015)[70].

7.3.1.2 Export from Norway

Most of the fish is exported from Norway in fresh head on gutted (HOG) form is sold to industrial customers in the EU, who further process the salmon into other products such as fillets, portions, smoked salmon or ready-meal products. A very small fraction of fish is filleted and further processed in Norway due to high production costs and custom duties for export of value-added products to the European market.

[69] https://en.seafood.no/news-and-media/news-archive/salmon-exports-valued-at-nok-64.7-billion-in-2017/

[70] Ministry of Fisheries and Coastal Affairs. (2005). The Norwegian Aquaculture Act. https://www.regjeringen.no/en/dokumenter/the-norwegian-aquaculture-act/id430160/

Transportation is a significant cost and is time consuming, therefore, decisions are taken to optimise routes and avoid losses. The distribution plan will depend on: shelf life, cost, transportation availability (capacity constraints), feasibility of transportation mode across the distance, demand, and customer contracts, volume & delivery times. There is concentration in the sector of exporters where the number of exporters from Norway have reduced from more than 120 in the year 2003 to less than 80 in 2017. The number of exporters behind 80% of fresh salmon volume have declined from 18 in 2003, to 10 in 2017.

7.3.1.3 Secondary processors in Norway

About 20% of the superior quality salmon is processed further in Norway. The decision on whether the products are sold for export or domestic market are for example based on quality of the harvest. It is the superior and the ordinary quality that is exported. A small proportion is designated as 'Production quality' which by regulation does not meet the quality standard for export. This fraction of Production quality fish is often processed further and sold in the Norwegian market. However, some volume of Superior and Ordinary is also sold in domestic market. There are a few independent smoking-house/filleting plants (i.e. secondary processing units) which mostly supply to domestic HoReCa and retail. From these secondary processing factories in Norway, some 10% goes to retailers or wholesalers for HoReCA, the other 10% for export as smoked, fresh or frozen fillets, or as steaks for retail (Figure 7-0-2).

7.3.1.4 Secondary processors in the EU

The most common secondary processing for salmon is smoking (EUMOFA, 2016). The ten largest producers of smoked salmon in Europe are estimated to have a joint market share of more than 60%. The processing is mainly carried out in Poland, France, the UK, the Baltic states and the Netherlands (MH Handbook, 2018)[71]. The salmon smoking industry and the retailing sector are highly concentrated. The French market is segmented between processor's brands, mostly for high-end products, and retailer brands, mostly oriented on entry-level and middle-end products.

7.3.1.5 Retail and consumption

Retail salmon products consist of fillets, smoked, whole and value added products (VAP). About 47% of the EU market supply is of fillets, 12% whole, 28% of smoked salmon, and 13% other value added products (EUMOFA, 2017).[72]

One of the main factors explaining the success of farmed salmon in retail markets is stable supply and stable quality. Supermarkets can actually plan to stock this product in various forms- not the case with fishery catches and supply – to be sure of having products all year round.

Factors that are most important for consumers in France when buying salmon are product attributes (odour, taste quality), origin, freshness and price according to surveys on the "Reputation of Norwegian salmon in France" by the Norwegian Seafood Council. While Norway has a standard differentiation of quality (i.e. Superior, Ordinary and Production Quality), primary producers typically have to sell by price only. However, it should be noted that there is a trend towards differentiation of products based on an image of sustainable production, origin and organic production. Irish producers have so far led the production of salmon from organically certified farms and

[71] Marine Harvest 2018, The Salmon Farming Industry Handbook
[72] EUMOFA (2017). The EU Fish Market. 2017 Edition.

some retail chains e.g. Lidl (Germany) have pledged to only sell products that are ASC certified or organic.

- *Origin and traceability are essential and these requirements are associated with standards and regulations. Retailers give information to consumers about the farm where the fish originates from. Assessment of compliance with standards is performed by Seafish and a rating is issued which UK retailers do respect when selecting farmers for supplies (Interview, UK producer March 2016).*

According to UK producers, their focus is on the niche market and a brand of Scottish origin which is appealing also for the US market,

- *"the Scottish salmon production is not a large scale production of commodity products, but rather high quality and differentiated product. Different from the Norwegian target of increasing production of commodity products". (Interview, UK producer March 2019).*

Consumers' demand for sustainability is currently being highlighted and perceived as a need to have more information about production methods and products' attributes. However, producers are skeptical of the consumers' knowledge and suspect that the need for additional information may only be true for a small percentage of consumers.

- *"In the end the consumers rely on products' standards and brands, they do not care about detailed information. However, there is a need to have the detailed information prepared (by the producers) upfront and accessible." (Interview, UK producer, March 2019)*
- *"Proliferation of ecolabelled products, a shift towards the fresh fish segment and an emphasis on convenience remain the characterising trends in salmon markets globally. On the industry side, identifying effective solutions to biological challenges, particularly sea lice, will remain a core focus" (Globefish Market report in January 2019)*[73]
-

7.3.2 Global Value Chain Governance Model

The governance forms and interactions between the actors in the salmon value chain vary depending on the size of companies, whether they are vertically integrated or not and different markets of products (Figure 7-*0-3*). The governance structure has developed over time from market to hierarchies where the organization of transactions and asset specificity has been influenced by structural changes, including horizontal and vertical integration as well as the concentration of supermarkets.

[73] Globefish market report (2019) http://www.fao.org/in-action8/globefish/market-reports/resource-detail/en/c/1176223/

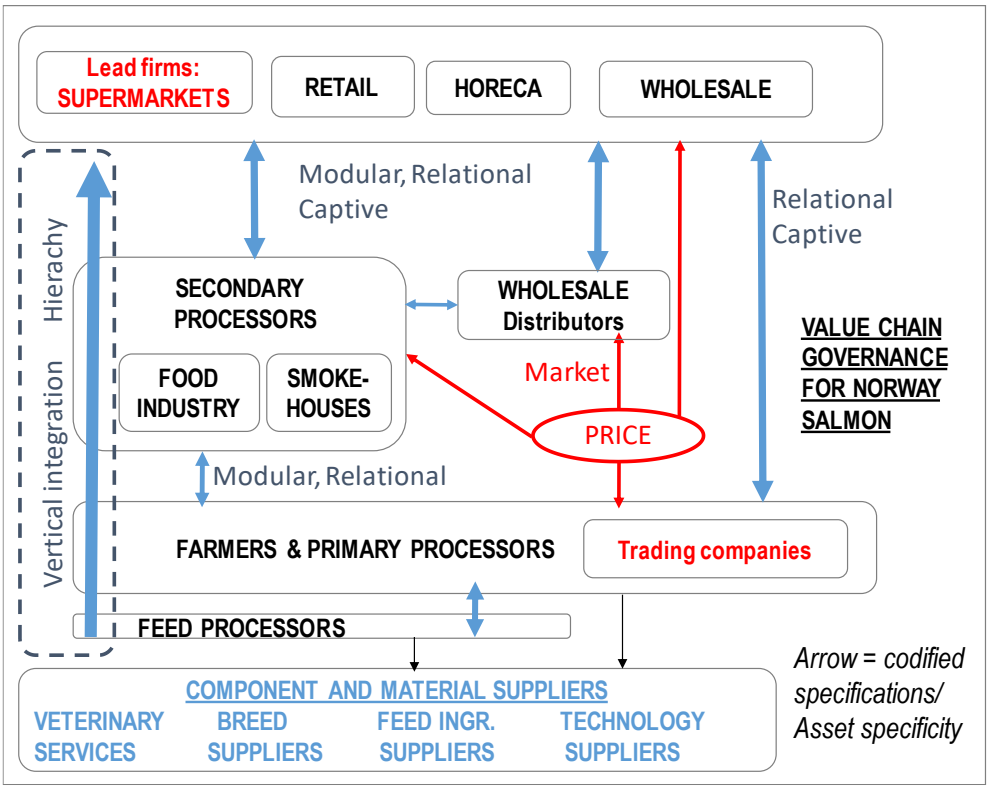


Figure 7-0-3 Governance analysis of salmon value chain (Source: UoI, 2019)

7.3.2.1 Market Governance

A scenario of "**Market**" governance is applicable for salmon producers and primary processors selling commodity products (HOG products) on the spot market where transactions are easily codified and suppliers are capable to make products based on technical standards and there is no input from buyers. The specifications are based on industry standards and the complexity of information exchanged is low, and therefore transactions need no explicit coordination. Standards facilitate transactions since information about the products and their specifications according to best aquaculture practices can be codified, and interactions are thus simplified to manage complex transactions. Moreover, suppliers can be easily changed if the lead firm no longer requires them or wants to change supplier. The essential point is that the costs of switching to new partners are low for both parties. This is typical for free market exchange where **buyers respond to specifications and prices set by sellers** (Gereffi et al., 2005)[74].

The main buyers are wholesalers and secondary processors (Figure 7-*0-3*). Some retailers who have their own secondary processing unit, buy salmon on the spot market either through wholesalers or traders on behalf of primary processors and farmers, which often are part of the same company. Norwegian-registered trading companies for farmed salmon include both independent trading companies and trading companies owned by salmon producers that have organized this activity in separate companies (E&Y, 2017). Medium sized and large salmon producers have established their own 'sales department' (trading companies) where they organize sales/export and perform trading as an integrated part of their production companies. Free market exchange

[74] Gereffi, G., J. Humphrey, and T. Sturgeon. 2005. The governance of global value chains. Review of International Political Economy 12:1, 78-104. doi.org/10.1080/09692290500049805

may also be the case for producers/processors selling directly to retail, HORECA and wholesale.

7.3.2.2 Producer Driven Global Value Chain

After the end of imposed trade barriers from both EU and USA in the 1980s and 1990s, global demand for salmon has been growing faster than supply. As a result, the sellers' market gives primary producers the market power in the value chain, which can explain 'super' margins compared to other food stuff producers.

- *There are no or small barriers of entry for new players. Some larger primary producers integrate downwards to secondary processing units, and some retail chains integrate upwards in the value chain to produce private label for themselves. The business structure is atomistic, leaving few players with market power. Thus, competitive advantage is reduced to cost effectiveness. (Norwegian salmon business expert, Feb 2019)*

Selling a commodity where demand is bigger than supply and market is free and open, including effective logistic and transaction cost leaves the power to producers. The competitive edge for primary producers of global commodity products by and large remains to cost efficiency in production (getting the biggest possible margin per produced unit).

On average, Norwegian producers have – up to now – been the most cost- effective producers, hence for a long period had good margins for the products. Prices have increased, continuously following the growing demand in existing markets and development of new markets[75].

- *The salmon value chain is (so far) very loosely organized and open so producers are exploring the best margins. And, of course, this will turn around when supply exceeds demand. Then the retail sector will have the power to press prices until the market is balanced again. (Norwegian salmon business expert, Nov 2018)*

Salmon for the global market, functions as a global commodity. This means there are no regulations of price between players in the value chain (as is often the case in the wild capture fisheries, i.e. PO's in EU, Fishermen's Sales Associations in Norway). After the deregulation of aquaculture products from the same regulations as wild fish in 1992, Norwegian salmon products have been sold through bilateral spot transaction (on weekly basis) or (to some degree) through long term contracts to secondary processing units - in particular in Europe (Denstad et al., 2015) [76].

- *Small farmers concentrate on primary production and mainly sell slaughtered and gutted whole fish to wholesalers/brokers or 'export companies' (trading companies). Export companies are mostly Norwegian companies specializing in global export activities of seafood. Mostly salmon, but also white fish products. A few Danish, French and Finnish secondary processors have their own Norwegian registered 'export company' (trading company) i.e. buying directly from small and medium sized primary producers to their own value-added activity in their own country. Logistics are organized by the buyer (broker/export company). Salmon*

[75] The Norwegian Aquaculture Analysis 2016, Ernst & Young AS http://www.ey.com/Publication/vwLUAssets/EY_The_Norwegian_Aquaculture_Analysis/$File/EY-The-Norwegian-Aquaculture-Analysis-web.pdf

[76] Denstad, A. G. , Lillevand, M., Ulsund, E.A. (2015). Production planning and sales allocation. in the salmon farming industry Norwegian University of Science and Technology

are sold in whole truck-loads (18 -20 MT/truck) and transport could be done either by Norwegian transport companies, or by other European trucking companies. Normal mass balance for trucking of seafood out of Norway and fruit, vegetables and flowers (from Europe) in to Norway (Norwegian salmon business expert, Feb 2019).

The salmon supply chain is "producer driven" and empowered by the vertically integrated companies which are typically owned by the producer company and having a strong bargaining power against retail. The power balance in the inter-firm relationships between producers/processors and the market remains mostly with the lead firm (retail/supermarkets) who control supply to consumers.

7.3.2.3 Supermarkets as lead firms in the salmon value chain

Concentration of supermarket chains (few players) gives retail the bargaining power for most food products in Europe and other 'developed' market areas around the globe. The emergence of very large retailers and supermarket chains has been accompanied by consolidation in the salmon farming sector, resulting in many companies seeking a higher degree of integration. Examples in aquaculture are MOWI (Marine Harvest), Salmar and Lerøy. Vertically integrated companies often control both production and processing stages, and sometimes also feed manufacturing or other (generally upstream) activities.

During the last decades, the concentration in the retail market has largely promoted the development of farmed salmon industry including asset investments and economies of scale in the logistic chain. The large exporting companies can match retailers' requirements of regularity of price, quantity and quality which are conditions that most seafood products cannot offer. Supermarkets are dominating retail fish market sales and high volatile salmon prices are currently leaving secondary processors in a tight position. Accordingly, the trading companies are also suffering to a certain extent under long term customer contracts at fixed prices and struggle to get acceptance for higher prices in the end markets, putting a strain on the gross margin (E&Y, 2017).

7.3.2.4 Secondary processors "stuck in the middle"

In general, secondary processors who are independent processors and carry out filleting, smoking and other value-added processing are 'stuck in the middle' in the value chain. They have to negotiate both ways – to buy the raw material and to sell their products to retail. The production planning in secondary processing therefore has to consider quality, demand of value-added products, market price, shelf-life, supermarket campaigns, seasonal considerations (e.g. holiday period etc.), contract fulfilment constraints, capacity constraints and inventory constraints.

7.3.2.5 Modular and Relational

Secondary processors are selling their products to retail market according to specifications. They rely on farmers / primary processors or wholesaler for raw material where they buy on the spot market and for the processed products they may have established modular or relational linkages with retail market. Modular linkages are distinctive in that they are based on codified knowledge rather than on prices, which are the basis for market exchanges.

Modular linkages could perhaps apply for the relations between retailers and suppliers (primary and secondary processors) in the salmon chain, where the supermarkets as

lead firms make decisions about supply requirements and the processors provide "turn-key" or customized products that meet the lead firm's needs. Modular linkages arise when product architecture is modular, technical standards can be codified, and suppliers have high capabilities to meet the buyers' requirements so as to need little explicit coordination between buyers and suppliers.

However, it is more likely that the interaction between processors and retail would be "**Relational**" buyers and suppliers. In the salmon value chain, the retailers in Europe either have contracts with independent secondary processors (smokers, manufacturers of VAP) based in Poland, France etc. or with secondary processors that are owned by Norwegian enterprises. The linkages between producers/primary processors and secondary processors may be characterized as relational for example when producing a differentiated branded product. "Relational" linkages emerge if product specification is hard to codify, transactions are complex, and supplier capabilities are high. Mutual dependence between buyers and suppliers leads to sustained interactions and explicit coordination between both parties.

- *Most secondary processors (in salmon) secure some part of volume as producers of 'private label' products for one or more retail chain. A few have a strategy of building their own brands – still they need to negotiate to retail sector for shelf space. Additional, product development, including cost of product innovations, very much lie on secondary processors. (Norwegian salmon business expert, Nov,2019)*

7.3.2.6 Captive

If supplier capabilities are not high enough to meet the buyers' requirements, governance structures tend toward the **captive type**, where suppliers are subject to the extensive intervention and monitoring of lead firms and depend on resources and market access provided by the lead firms. This type of market behaviors can be associated with subcontracting of secondary processors of e.g. salmon fillets by the big retailing chains as discussed in the trading relationships of the French industry and retailers by Guillotreau and LeGrel (2003)[77]. The processors were buying fish specifically for the supermarket and hypermarket fish stores (in the sample, 42% of processors' total sales go to supermarkets) or processing fish bought directly by the retailers. In addition, 28% of the retailers reported that they ordered fish prior to the auction sales and 23% stated that they sub-contracted to the processors.

7.3.2.7 Hierarchy

A "***Hierarchy****"* governance would be applicable for the vertically integrated large companies of the salmon value chain who mainly target high end retailers. The increasing number of requirements from large retail chains has been a main driver for vertical and horizontal integration. The objective has been to increase the negotiation power towards the retailers with respect to price, product, and volume (Nesse (2014)[78]. Hierarchy governance is characterized by high incentives to centralize control of strategic investments. This is exemplified by the Norwegian vertically integrated salmon firms like MOWI (Marine Harvest) who have ownership of their feed plants in Norway and Scotland and also extend downwards in the chain where they have

[77] Guillotreau, P., Le Grel, L. (2003) Chapter 1.1: The structure of the fish value chains and price-cost margins. A Multivariate Analysis of Cointegration Results In Prices and margins along the European seafood value chain. EU funded Salmar project Ed. P.Guillotreau, Cahiers de l'Artemis, Organisations et Stratégies Industrielles, n° 4, 2003

[78] Nesse, A. G. 2014, Smoother harvest of farmed salmon, value adding or costly?, NTNU

established their own food manufacturing factories in Europe for producing value added products for the European retail and foodservice markets. The company "MH Consumer Products" processes fish from raw material to value-added products and sells the majority of their products to final sales points met by end consumer (retail + food service). Individual companies in the vertically integrated firms are in general responsible for negotiating with their suppliers and buyers.

- *The secondary processors owned by big Norwegian enterprises also face the same situation as independent processors. Giants like MOWI sell the salmon to their secondary processors in Poland, Belgium and France presumably at the same price as they would have sold to independent processors. These secondary processors although owned by Norwegian enterprises, operate more or less independently and have to compete with independent secondary processors. (Norwegian salmon business expert, Nov,2016)*

7.3.2.8 Hybrid organisation and governance

A governance and organisation framework proposed by Menard (2017)[79] combines transaction cost and relational contracts models to capture the variety of governance forms that are prevalent in the agrifood industry. "*The framework distinguishes between organizational structures differing according to the intensity of control exercised over the rights to use resources, and the modalities of governance through which these structures operate".* The hybrid form seems to be characteristic for the salmon value chain where the large integrated firms and their subsidiaries constitute a network of firms that organize their transactions through a combination of different arrangements as is characteristic for plural hybrid forms where a firm (or a network of firms) could partially produce in-house (or distribute through its own outlets), outsource other parts of its activity through contracts with specific firms, and possibly use spot markets, all at the same time (Menard, 2017).

- *"The development of third party assessment and certification of fisheries and aquaculture has provided new forms of governance in sectors that were traditionally dominated by state based regulation. Emerging market based approaches are driven by shareholder expectations as well as commitment to corporate social responsibility, whereas community engagement is increasingly centered on the questions of social license to operate. Third party assessment and certification links state, market and community into an interesting and challenging hybrid form of governance" (Vince and Haward, 2017)[80].*

The salmon chain governance structure is best described as "Hybrid" where the large integrated firms and their subsidiaries constitute a network of firms that organize their transactions through a combination of different arrangements. The inter-firm relationships are characterized by a range of forms from markets to hierarchy, where modular, relational and captive structures can be identified depending on the different size of the companies and whether they are vertically integrated or not.

[79] Ménard, C. (2017). Organization and governance in the agrifood sector: How can we capture their variety? Agribusiness, 34(1), 142–160. doi:10.1002/agr.21539

[80] Vince J., Haward M. (2017), Hybrid governance of aquaculture: Opportunities and challenges Journal of Environmental Management 201 138-144

7.4 EU AND NORWAY GOVERNANCE: KEY POLICIES, REGULATIONS AND STANDARDS

7.4.1 AQUACULTURE LICENSES AND REGULATORY FRAMEWORK

Table 7-0-2 summarises Norwegian and EU policies, regulations and private standards pertaining to salmon production. They cover a range of issues with a key focus on aquaculture production, fish welfare and regulations on requirements to prevent diseases and environmental impacts, transparency, and sustainable development. In Norway, aquaculture is regulated according to the Aquaculture Act[70] and environmental monitoring. There are three types of production licenses in Norway which include Regular Concession, Development Concession or Green Concession (EUMOFA, 2017)[72]. Aquaculture licenses are granted in allocation rounds determined by the Ministry. Applicants with the highest bids are granted the licenses (MFCA, 2007)[81]. The license states the maximum level of salmon the farmer can have in the sea at any time during the production process. This is the maximum allowed biomass (MAB) and is measured in tonnes. The MAB regulation is valid both on the company level and for the specific production site[82]. The development licenses are awarded for facilitating development of new technologies to address challenges in the sector.

The traffic light system is a recent regulation scheme introduced by a Governmental Note to the Parliament[83] to regulate further growth in production capacity (licences). The coast is divided into 13 production areas and into 3 colour zones (red, yellow and green) based on the environmental conditions in those areas that may limitproduction and biomass. A green light means farmers might be offered production growth, a red light means reduction, while amber means it has to stay at that level[84].

The main objective for the new regulatory framework was to promote sustainable growth in the Norwegian aquaculture sector. Although 'sustainability' concept also includes social and economic aspects, environmental issues have been and are the main focus of the new regulation scheme. One of the key elements of the regulation is the consideration to wild salmon stocks, namely the influence that increased levels of sea lice, and escapes of farmed salmon to the open sea could have to wild salmon populations. A Comparative analysis of the regulatory aspects of Canadian, Scottish and Norwegian aquaculture by the Standing Senate Committee on Fisheries and Oceans in Canada (POFO, 2016)[59] is also of interest. The regulatory framework in all countries is focused on environmental issues.

Table 7-0-2 Norwegian and EU policies, regulations on aquaculture and industry private standards

Aquaculture licenses and Regulations		
The Aquaculture Act	Grant of license Norwegian Ministry of Fisheries and Coastal Affairs[85]	Regulations under the Act govern the allocation of licenses, the species to be produced, the geographic areas or sites where production is to take place and the maximum biomass permitted at a given location..

[81] Ministry of Fisheries and Coastal Affairs. (2007). Strategy for a competitive Norwegian aquaculture industry.

[82] Directorate of Fisheries, https://www.fiskeridir.no/Akvakultur/Drift-og-tilsyn/Biomasse

[83] Meld.St. 16 Forutsigbar og miljømessig bærekraftig vekst i norsk lakse- og ørretoppdrett. 2014-2015.

[84] https://salmonbusiness.com/new-traffic-lights-will-regulate-the-norwegian-salmon-production/

[85] Ministry of Fisheries and Coastal Affairs. (2007). Strategy for a competitive Norwegian aquaculture industry. Norwegian ministry of fisheries and coastal affairs.

Traffic Light System[81] 86	Regulated by the Norwegian Department of Fisheries and Aquaculture	*A new* regulation scheme which was introduced by a Governmental Note to the Parliament[87] to regulate further growth in production capacity (licences).
Maximum Allowable Biomass (MAB)[82]	Regulated by the Norwegian Department of Fisheries and Aquaculture	Maximum volume of fish a company can hold at sea at all times. Aquaculture licenses are limited in terms of MAB. A standard license, for example, is for 780 tonnes of MAB with some variations in the northern most counties in Norway.
Regulation on Operation of Aquaculture facilities	Ministry of Trade and Fisheries, 2008	The regulation covers the operation of aquaculture facilities with a purpose to promote good health in aquaculture animal and to safeguard fish welfare.
Regulation on combating salmon lice in aquaculture facilities	Ministry of Trade and Fisheries. 2013	The purpose of this regulation is to reduce the incidence of salmon lice and minimize its effect on fish health and wild stocks of salmon.
Regulation on slaughterhouses and production facilities for aquaculture animals	Ministry of Trade and Fisheries. 2007	The regulations apply to businesses where slaughtering or production of aquaculture animals is carried out with an aim to regulate the slaughtering process, handling of by-products, waste water treatment and hygiene.
Regulation on additional requirements for transport, turnover and import of aquaculture animals and products thereof	Ministry of Trade and Fisheries. 2011	The regulations include animal health requirements for the sale and import of aquaculture animals and their products
Regulation on the establishment and operation of quarantine facilities for aquaculture animals	Ministry of Trade and Fisheries. 2010	The regulations include requirements for the establishment and operation of quarantine facilities for aquaculture animals.
Regulation on measures to prevent, limit and combat pancreatic disease (PD) in aquaculture animals	Ministry of Trade and Fisheries. 2017	The purpose of this regulation is to reduce the consequence of pancreatic disease (PD), prevent PD from establishing itself in surveillance zone and to limit the prevalence of the individual subtypes of Salmonid alphavirus (SAV)
Regulation on protection of salmon stocks	Ministry of Trade and Fisheries. 2009	The regulations are intended to ensure that a selection of the most important salmon stocks is given a special protection by imposing special requirements on aquaculture-related activities in or by national salmon rivers and national salmon springs.
Regulation on requirements for technical standards for equipment that are used in aquaculture activities.	Ministry of Trade and Fisheries. 2003	The purpose of these regulations is to limit escapes from floating fish farms by ensuring proper technical standards on such facilities, as well as proper operation and maintenance of the facilities.
Regulation on public control of compliance with regulations on feed, foodstuffs and	Ministry of Trade and Fisheries, Ministry of Agriculture and Food,	The purpose of the regulation is to ensure effective official control of food safety and quality in a food production

[86] https://salmonbusiness.com/new-traffic-lights-will-regulate-the-norwegian-salmon-production/

[87] Meld.St. 16 Forutsigbar og miljømessig bærekraftig vekst i norsk lakse- og ørretoppdrett. 2014-2015.

health and welfare of animals (Control Regulations)	Ministry of Health and Care Services, 2010	chain perspective, animal and fish health and welfare, plant health, and cosmetics safety.
EU polices and Directives (Source: H2020 SUCCESS project)[88]		
Strategic guidelines for the sustainable development of EU aquaculture [COM(2013 229 final]	National Strategic Plans for aquaculture and Operational Programme of the EMFF	Common Fisheries Policy (effective since 1 January 2014) aims at both strengthening the protection of fishery resources, supporting the sustainable development of aquaculture and improving the competitiveness and economic sustainability of the EU seafood value chains.
EU's maritime and fisheries policies (EMFF) Priority areas for removing obstacles to aquaculture development	-Reducing administrative burdens - Improving access to space and water -Increasing competitiveness -Exploiting competitive advantages due to high quality, health and environment standards	Member States asked to draw up ambitious national strategic plans for the development of aquaculture and operational programmes (OP) for the utilisation of the related funds of EU's maritime and fisheries policies (EMFF) for 2014-2020 (eligibility till 2023). The second priority of the EMFF relies on "Sustainable Aquaculture", with the objective "to make the sector more successful and competitive by focusing on quality, health and safety, as well as eco-friendly production". This second priority will receive 21% of the total EEMF allocation at the EU level (€6.4 billion).
Water Framework Directive (WFD)	A common regulatory framework for water legislations in all the Member States	Several other directives and regulations have first to be implemented correctly, such as the Urban Waste Treatment Directive, the Nitrate Directive, the Directive on Sustainable Use of Pesticides and the Industrial Emissions Directive [COM(2015) 120 final].
Marine Strategy Framework Directive (MSFD)	The MSFD, was adopted by Member States in 2010 Aims to achieve good environmental status in marine waters in 2020.	While the WFD covers coastal waters up to the limit of one (nautical) mile for ecological status assessment and up to the limit of territorial waters (12 miles) for chemical status assessment, the MSFD takes over up to the 200 miles limit. The draft guidance document prepared by the Commission (MSCG_17-2015-1122) considers that the potential main effects of aquaculture on the environment will come from the descriptors D2 (non-indigenous species), D6 (sea-floor integrity), D5 (eutrophication), D8 (contaminants) and D10 (marine litter).
Environmental impact assessment- EIA Directive	EIA is required for the creation or extension of an aquaculture farm. Procedure to be followed is described in the Directive	The conditions vary according to the type of aquaculture and to the country, with different thresholds of production (as main criteria for screening), and also depending on existing national regulatory frameworks for environmental assessment/environmental permits which can apply to aquaculture activities.
Appropriate Assessment in Natura 2000 areas	The purpose of the assessment is to determine whether or not the project might impact the integrity of a Natura 2000 site	A case by case approach, taking account the relevant factors that determine the environmental impacts of aquaculture, such as the location of the farm, the type of cultured species; the culture method and level of aquaculture intensification, and the sensibility and vulnerability of the environment to possible pressures from aquaculture activities
General Food Law and Offical Controls	EU laws implemented	

[88] GIRARD Sophie & DAURES Fabienne (2018) DELIVERABLE: D3.1 BASIC DESCRIPTION OF REGULATION SYSTEMS APPLIED TO CASE STUDIES. H2020 SUCCESS project GA No 635188

Competition and Fairness		
Competition Act: LOV-2004-03-05-12 .	Law on Competition between Enterprises and Control of Business Associations	Lov om konkurranse mellom foretak og kontroll med foretakssammenslutninger (konkurranseloven) https://lovdata.no/dokument/NL/lov/2004-03-05-12
Industry intiatives and private scheme		
The Global Salmon Initiative (GSI)	A leadership initiative by global farmed salmon producers, focused on making significant progress towards fully realising a shared goal of providing a healthy and sustainable source of protein to feed a growing population, whilst minimising the environmental footprint, and continuing to improve social contributions. GSI's focus areas are biosecurity (priority is sea lice), standards (ASC), feed and nutrition (fish meal and oil), and improving industry transparency. https://globalsalmoninitiative.org/en/what-is-the-gsi/	
The Aquaculture Stewardship Council (ASC) Standard	ASC aims to be the world's leading certification and labelling programme for sustainably farmed seafood. The ASC's primary role is to manage the global standards for responsible aquaculture. ASC works with aquaculture producers, seafood processors, retail and foodservice companies, scientists, conservation groups and consumers https://www.asc-aqua.org/	
The GLOBAL G.A.P Aquaculture Standard,	This standard sets various criteria for good aquaculture practices at every stage of production and is the only aquaculture farming standard to have achieved the Global Food Safety Initiative (GFSI) recognition. The standard covers the entire production from feed to fork and sets criteria on legal compliance, food safety, occupational health and safety, animal welfare and environmental and ecological care. https://www.globalgap.org/uk_en/	
Best Aquaculture Practices (BAP) standards,	The Global Aquaculture Alliance (GAA) coordinates the development of the Best Aquaculture Practices (BAP) certification standards for seafood processing plants, farms, hatcheries and feed mills. https://www.bapcertification.org/Standards	
IFFO The marine ingredients organization	IFFO is an international trade organization that represents and promotes the marine ingredients industry, such as fishmeal, fish oil and other related industries http://www.iffo.net/	

Salmon producers in Norway and the EU in general have been leading in the development of voluntary standards and in recent years, uptake of the Aquaculture Stewardship Council (ASC) Salmon standard. The ASC standard development was a joint initiative of World Wildlife Fund through the Aquaculture dialogue platform of stakeholders. ASC accreditation gives verification of environmental and social integrity of the products and this can also be communicated by a consumer facing logo. The largest aquaculture companies in Norway are all certified to the ASC standard, but smaller producers are somewhat behind on this, often lacking implementation resources. Currently 151 sites in Norway have ASC certification (many belonging to the same company) (ASC, 2019)[89]. In the UK, a number of production standards operate, such as the Code of Good Practice for Scottish Finfish Aquaculture, Label Rouge, RSPCA Freedom Food and Quality Trout UK. Further relevant standards and certification for aquaculture include IFFO, Global Gap, The Global Aquaculture Alliance, Friend of the Sea and Soil Association. The ASC standard performs well in environmental and social matters, but does not specifically address animal welfare and

[89] ASC(2019) website http://asc.force.com/Certificates/ Accessed March 2019

food safety. The GLOBALG.A.P and BAP standards contain to larger extent minimum requirements, and depend more on local regulation (Bonasaken,2014).[90]

7.5 GOVERNANCE, FAIRNESS AND RELATIONSHIPS IN THE SALMON VALUE CHAIN: FINDINGS

This last section draws on findings from stakeholder consultation to focus on three main areas of interest: (i) the perception of power in the chain, (ii) whether the price and value distribution in the chain was perceived as fair, and (iii) the influence of the spot price and the use of contracts. The issue of fairness is mainly addressed in terms of price determination and the potential influence that large companies can have on the spot price. While perceptions of stakeholders in the salmon value chain towards power asymmetries differ across the chain, such perceptions appear to explain the decision-making for vertically integrated companies. However, it is less clear to what extent the performance of the wider chain including the smaller aquaculture companies and secondary producers is affected.

7.5.1 PRICE AND CONTRACTUAL ARRANGEMENTS

Norwegian salmon (fresh or frozen, whole or fillets) is sold in B2B negotiations on weekly bases. Wholesalers from all the main consumer markets (Europe mostly) are buying whole truck loads either directly or through Norwegian wholesalers as representatives for a European wholesaler or secondary processors in Europe. There is an emergence of long-term contractual supplier–customer relationships between aquaculture-producing companies and secondary processors or supermarket chains.

- *Producers sell through direct orders from buyers, but also to a suite of other channels e.g. some sell to markets (wholesalers) and others sell to high end stores, in particular the large companies having long term contract, and high end products with sustainability credential to restaurants etc. Some sell at spot markets but ideally they would prefer to sell through long term contracts. Prices for producers / processors who target the premium end are not fixed by the spot prices. (Interview, UK Salmon producer, March 2019)*
- "*It is estimated that approx. 60% is sold on such spot market conditions – to the highest bidder and about 40% of the volume is contracted mostly from the largest producing companies, however, this ratio varies." (Norwegian salmon business expert, Feb 2019).*
- *On average the fraction of fixed contracts varies from 40- 50% - down to 25- 30 % depending on the price fluctuations in the market. If spot market prices are high, processors are reluctant to contract big volumes for future deliveries. If the spot price is low, farmers are reluctant to future contracts, hoping the (spot) price will go up again. (Norwegian salmon business expert, Feb 2019)*

The **spot market price** is influenced by the average price the week before for fish to be delivered the following week. The price is based on information from several links in the value chain, including farmers, exporters and importers. The biomass development and seasonal factors are the main determinants of shifts in salmon supply

[90] Bonsaken, E.(2014) Challenges and Potential of the Aquaculture Stewardship Council Standard for Salmon Fish Farming Case: Marine Harvest Group. MS Thesis, NTNU, Trondheim.

in the short term and influencing the price of salmon on the spot market[91],[92]. To mitigate risks associated with price and volume and to possess more predictability for future sales, producers can rather opt for long-term contracts. These enable better production planning and capacity utilization and guarantee minimum order for seller and supply for buyer. However, the contracts introduce obligations in terms of trade volumes and less flexibility when problems or opportunities arise. The contracts of producers are typically to supermarket chains in Europe or the large value-added processors in Europe. It is usually the customer that approaches the supplier with an offer, not the other way around[76]. Duration of contracts is typically for 3 – 6 months, where the spot price level is the base for the price negotiations. The contracts would typically include volume, HOG weight, delivery time, and quality where price is fixed and then usually adjustable according to spot price level (Denstad et al., 2015)[67]. Producers must thus decide what proportion should be tied-up in contracts and the type of contracts that they want to be engaged in. The main drivers for such decisions are in terms of price and volume, the delivery frequency, the time horizon of agreement and the network wanted (many small suppliers or a few main suppliers).

The **use of contracts** in salmon industry has increased substantially in recent years with the objective to reduce risk and transaction costs (Kvaløy, 2006)[93]. The main types of contracts are fixed price contracts, adjustable contracts and partially adjustable contracts. Information about the use of contracts and their details is not normally made public by the contracting parties. To understand better the influence of contracts on price, Larsen and Asche (2011)[94] investigated the use of fixed price contracts for Norwegian salmon exports to France based on all export transactions between the two countries. The analysis for the year 2006 showed that almost 25% of these exports were traded using fixed price contracts and contract prices were renegotiated at different intervals, including as infrequently as once a year. Some contracts allow the contracting parties to adjust contract prices when the export price moves significantly.

The use of contracts creates a wedge between salmon export prices and spot prices in periods of price volatility, which in turn reduces price transmission. In the case of contract breach the reason for contractual incompleteness is generally two-fold according to Kvaløy and Tveterås (2008)[64]. First, there may be variables that cannot be easily verified by court in case of breach, for example if the parties contract on quality, which may be difficult for the court to assess. Second, even if parties are able to write complete contracts, it may be less costly to engage in simple contracting. This implies relying on market enforcement where self-enforcing relational contracts are designed such that the parties have economic incentives to honour it in all contingencies. A relational contract is a modelled contract on future transactions where the present value of honouring the contract vs the present value of backing out decides the contract's self-enforcing conditions.

When asked about the level of trust and collaboration between aquaculture companies, the general perception is that there is trust and various collaborations:

[91] https://www.undercurrentnews.com/2019/03/18/sparebank-norway-salmon-spot-price-dip-not-a-surprise/

[92] https://www.ey.com/Publication/vwLUAssets/EY_-_The_Norwegian_Aquaculture_Analysis_2017/$FILE/EY-Norwegian-Aquaculture-Analysis-2017.pdf

[93] Kvaløy, O (2006) Self-enforcing contracts in agriculture. European Review of Agricultural Economics, 33, 1, 73-92. https://doi.org/10.1093/erae/jbi037

[94] Larsen, T.A and Asche, F. (2011). Contracts in the Salmon Aquaculture Industry: An analysis of Norwegian Salmon Exports. Marine Resource Economics, Volume 26, pp. 141–150

- *"There has been an increased horizontal cooperation where small farmers share some resources and services as described by a Norwegian salmon business expert: First, most frequently as part owner of an export company (to secure sales when harvesting and up to date market information); Second, joint ownership of a smolt production unit (to secure enough and good quality 'smolt' (juveniles) to put into sea for grow-out phase; Third, some small producers also have joint operational co-operation (building 'economies of scale' for optimal use of labour and know how). In variants of all mentioned above we'll find cooperation in buying feed and major equipment, improved technology items, etc. (Improving buying power up against major service providers*)" *(Norwegian salmon business expert, Nov,2016)*
- *"Aquaculture is a small industry in Scotland in terms of actors and players, "if there wouldn´t be trust they would have significant problems". In other more established industries e.g. the fishing industry in the UK there is a lot more of mistrust between the fishing companies and fierce competition in the market, while the salmon industry has good relations and recognize the mutual benefits. The level of trust has always been high between the salmon farming producing companies. If there are problems with fish, the feed companies often get pointed at, but very rarely the farming companies. The producers are competitive today with good margins. When under financial pressure as was the case ten years ago, this may have influenced the trust, but today the producers are getting good margin." (Interview, UK producer, March 2019).*

According to a Norwegian feed producer, the sourcing of raw material for feed has various challenges and risks involved. In an effort to secure their supplies they have a portifolio of different producers globally. Certified producers are audited and issues like deforestation, non GMO, ecosystem concerns and nutritional content are in the spotlight. Various tools like LCA to monitor carbon footprint and protein and fat level analysis are applied and verification of antioxidant use, traceabiltiy and location are important. An example of a case which had a serious economic impact was the EFSA[95] inconclusive assessment of the safety of synthetic antioxidants (ethoxyquin) in fish meal. *„The S-American fish meal partners were not ready to implement the use of alternative antioxidants (polyphenols) whereas the N-Atlantic meal producers had done so and as a consequence their meal was in demand and this impacted high price of meal from this region." (Norwegian feed producer, May 2019)*

The access that actors have to information that helps them make decisions on production, harvest, and sales with regard to the transparency of interactions between actors in the chain is somewhat limited. However, there is an abundance of transparent metric and data related to the farming process, through regulatory requirements and standards.

- *"For a clever person there is already a massive load of business data out there to gain an overview, they just need to work through it. For example, the feed producers (only 3 companies in Scotland) will be able to figure out the market share of the producers by their use of ingredients etc. and same for the use of equipment etc. Although there is not a government structure to make the data available there is a level of transparency in place." (Interview, UK producer, March 2019)*

[95] European Food Safety Authority

7.5.1.1 Futures

Salmon farmers have been managing the uncertainty and variability in profitability by using price derivatives since 2006. Fish Pool ASA[96] located in Bergen, Norway, was established in 2005 as an international, regulated marketplace for buying and selling of financial salmon contracts. They trade derivatives contracts on the salmon spot price. Fish Pool ASA has established a synthetic market price, or reference price, named the Fish Pool Index™ (FPI), which is the basis for the settlement of all financial salmon contracts at Fish Pool[97]. Oslo Børs ASA owns 97 % of the shares in Fish Pool ASA.

Asche et al., (2016)[98] studied Fish Pool salmon futures contract with respect to how well the market performs in terms of the futures price being an unbiased estimator of the spot price and whether the market provides a price discovery function. The results when using data for 2006–2014 and with futures prices with maturities up to 6 months showed that the spot and lagged futures prices were co-integrated and that the futures price provided an unbiased estimate of the spot price. They concluded that the salmon futures market is still immature and has not yet reached the stage where futures prices are able to predict future spot prices. However, another study by Ankamah-Yeboah et al. (2016)[99], using a more recent data set, found a higher degree of maturity of the salmon futures. They highlighted the importance of the relationship between time to maturity and the futures price volatility when developing hedging strategies, pricing options and setting margins in the salmon futures markets.

7.5.2 FAIRNESS AND PRICE

The various theoretical dimensions of fairness need to be considered in terms of their manifestation through unfair trading practices (UTPs), and how these incidences can be both minimised and regulated. Although UTPs can arise in any market or sector of an economy, they have the potential to be especially problematic in food supply chains, as agricultural producers may be placed under undue pressure and have limited bargaining power in negotations with larger purchasers, such as supermarkets or retailers, given the lack of alternative buyers. The European Commission has defined UTPs as practices that "grossly deviate from good commercial conduct, are contrary to good faith and fair dealing and are unilaterally imposed by one trading partner on another" (European Commission, 2018). More recently, on 12 March 2019, the EU has agreed within the 'Directive on Unfair Trading Practices in the Food Supply Chain' a set of new minimum protection standards prohibiting UTPs, which will apply to companies with a turnover below €350 million. The new rules will cover producers,

[96] Fish Pool ASA is licensed by the Norwegian Ministry of Finance to operate as a regulated marketplace for commodity derivatives with fish and seafood as underlying products. They are bound by the rules of the license and under surveillance of The Financial Supervisory Authority of Norway (Finanstilsynet).

[97] The aims of the FPI are fivefold: give a correct reflection of the market price; to be possible to re-examine/verify; to not be possible to manipulate; to be transparent and available; and to remain neutral to all parties (FPI, n.d.). The FPI is comprised of three index elements linked to the average weekly spot price of buying and selling Fresh Atlantic Salmon: Nasdaq Salmon Index (exporter's selling prices); Fish Pool European Buyers Index (large purchasers purchase price); and Statistics Norway customs statistics (SSB) on exports (FPI, n.d.).

[98] Asche, F., Misund, B., and Oglend, A. (2016) The spot-forward relationship in the Atlantic salmon market. Aquaculture Economics & Management, 20, 2, 222–234. http://dx.doi.org/10.1080/13657305.2016.1156192

[99] Isaac Ankamah-Yeboah, Max Nielsen & Rasmus Nielsen (2016): Price formation of the salmon aquaculture futures market, Aquaculture Economics & Management,DOI: 10.1080/13657305.2016.1189014

cooperatives, food processors and retails, and will also apply to non-EU suppliers. In particular, they will cover the following issues: late payments for perishable food; last-minute cancellations; unilateral or retroactive changes to contracts; forcing the supplier to pay for the wastage of products; and refusal of written contracts. Other practices, including the return of unsold products to suppliers, will only be permitted if expressly agreed in advance in writing by both parties to the arrangement (European Parliament, 2019).

Price is considered to be one of the most important factors that will increase a supplier's fairness perceptions. As far as suppliers are concerned, the impact of price on a long-lasting supply chain is complicated, due to the complexity of the relationship ages, the cooperative nature of relationships, and various market circumstances. In agricultural supply chains, suppliers lack pricing power because of their inferior position. Therefore, suppliers will pay more attention to retailers' procurement pricing criteria, which involve examining product quality, purchase quantity, geographic position, and relationship age. It can be argued that the impact of price satisfaction on fairness perception is not only related to whether agricultural suppliers can fairly gain profits or not but also connected to the endurance and stability of the cooperative relationship in question. Therefore, suppliers are sensitive to prices and high levels of price satisfaction will effectively enhance the cooperative stability of the supply chain in question.

The perception of fair value distribution / Is value distributed fairly to all actors in the chain?

- *Most actors would say it isn´t a fair value distribution „Would like larger slice of the cake". Aquaculture business is perceived as successful and producers would strive to have best price. There is always going to be a question of imbalance. In Scotland there are not so many large high volume companies as in NO, so business is very much dependent on relationships between the companies and close relations within districts. Producer organisation do have pricing data from their members and submit aggregated records to EU but they also maintain an oversight from all members, however, this is not public. (Interview, UK producer, March 2019)*
- *"No, not at all the value is not distributed fairly! The aquaculture producers hold the power and press the price from the feed producers who are competing on the market. Currently, there are three main feed producers in Norway with overcapacity to produce feed. (Norwegian feed producer, May 2019)*
- *The price is perceived to be fair, most of the pricing is done through contracts with retailers. Some Scottish branding is retailer specific with certain producers, so they develop the pricing structure based on that. Retailers also target different quality or areas of demographics e.g Waitrose a high end retailer, target organic salmon, or high premium quality, another example is M&S. In the end the pricing is fitting to the end consumer (Interview with UK producer, March 2019)*

The price of salmon is highly volatile and the price has evolved since the initial drop of salmon prices in Europe from 10 Euros/kg in the early 1980s to 3 Euros/kg in 2000 (approx 26 NOK). For retailers at this time, this low price was the key in attracting new consumers. The concentration of the retail sector resulted in a new market organisation

and new pricing behaviours where mark-up pricing was practiced and the fish market looked increasingly like any agricultural food market (Guillotreau and LeGrel, 2003)[100].

Between 2008 to 2012, the salmon price has been fluctuating (Figure 7-0-4). Since 2012 the volume growth has stagnated but export prices for fresh whole salmon increased annually.

In 2018, the average export price of fresh salmon amounted to around 61 NOK per kilogram. In the first months of 2019 record high prices up to 70 NOK per kg were reported, but by May 2019, the prices have decreased to 55-60 NOK.

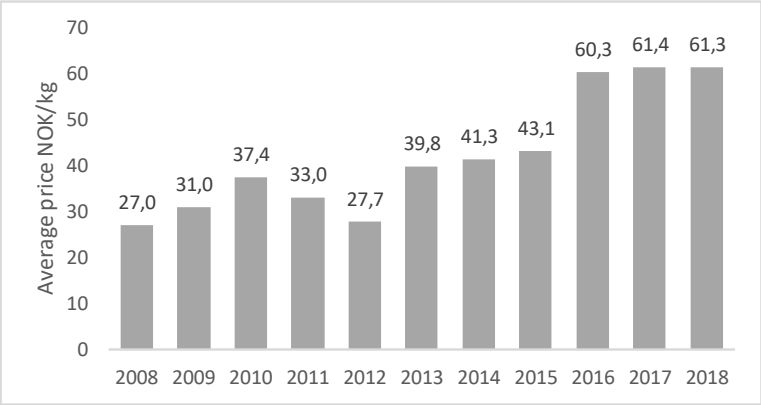


Figure 7-0-4 Average export price of fresh whole salmon from Norway from 2008 to 2018 (in NOK per kilogram) Source: Authors own calculation based on data from https://www.statista.com/statistics/666053/average-export-price-of-fresh-whole-salmon-from-norway/

Landazuri-Tveteraas *et al*. (2017) [101] measured the extent of price transmission and tested price leadership in the salmon supply chain. The data represent monthly observations (2005–2014) on export price of fresh salmon from Norway and on retail prices for a variety of salmon products in France and United Kingdom. They showed in agreement with other studies that price transmission lessens with the degree of value added and specifically that price transmission to retail prices decreases, as more processing is involved and increases for packaged salmon products compared to salmon sold in the fresh fish counter.

- *Economic and organizational co-operation, competitive market, low entry cost for traders and wholesalers, and easy accessible price/ volume information. This gives few possibilities for players in the value chain to establish oligopoly or to 'skew' level of information. So, as long as there is imbalance in supply – demand, the primary production has increased throughout the mature phase (latest 10-20 years) of the industry, compared to the first entrepreneurial phase. Consequently, there is no significant difference in economic performance between small/medium sized companies compared to large entities. The best results are often among medium sized companies. (Norwegian salmon business expert, Nov 2019)*

Asche et al (2018) [102] investigated the impact of firm size and price variability on firm profitability in the Norwegian salmon farming industry. They used operating efficiency indicators like working capital management (net working capital/total assets) and

[100] Guillotreau, P., Le Grel, L. (2003) Chapter 1.1: The structure of the fish value chains and price-cost margins. A Multivariate Analysis of Cointegration Results In Prices and margins along the European seafood value chain. EU funded Salmar project Ed. P.Guillotreau, Cahiers de l'Artemis, Organisations et Stratégies Industrielles, n° 4, 2003

[101] Landazuri-Tveteraas, U., Asche, F., Gordon, D. V., & Tveteraas, S. L. (2017). Farmed fish to supermarket: Testing for price leadership and price transmission in the salmon supply chain. Aquaculture Economics & Management, 22(1), 131–149. doi:10.1080/13657305.2017.1284943

[102] Asche, F., Sikveland, M., & Zhang, D. (2018). Profitability in Norwegian salmon farming: The impact of firm size and price variability. Aquaculture Economics & Management, 1–12. doi:10.1080/13657305.2018.1385659

operating leverage (fixed assets/total assets) and showed that they were positively associated with profitability. They also found that salmon price variability increases profitability, and smaller companies appeared to be in better position to take advantage of the profit opportunities that price variability offer, compared to larger companies who are more likely to be engaged in contracts.

7.5.2.1 High spot market prices potentially explained by price fixing

A recent European price-fixing investigation has focused on the Norwegian salmon industry and during the last months there have been news in the media[103] on these allegations of price fixing. "*The [European] commission has received information, from different actors operating at different levels in the salmon market, alleging that some Norwegian producers of farmed Norwegian Atlantic salmon participate in or have participated [in] different ways of price coordination in order to sustain and possibly increase prices of farmed Norwegian Atlantic salmon.*" Key to the alleged conspiracy was manipulation of the spot market for Atlantic salmon in Oslo. While only small part of Norway's salmon production is sold on the spot market, with much of the remainder sold via annual contracts, the spot prices set the baseline for longer-term contract prices. A US lawsuit based on similar allegations that Norwegian firms are engaged *"in conduct designed to raise and stabilize the prices of farm-raised salmon sold on the spot market and pursuant to contracts."* (SeafoodSource, 2019). Media sources have furthermore reported that *„Since 2015, salmon buyers in Europe have complained that Norway's salmon producers, including Mowi, have been rigging the spot market by using subsidiary companies, including Mowi's Polish subsidiary, Morpol (a fish processor and distributor), to drive up the spot price [.....]" (Seafoodsouce.com, April 25, 2019).*

The perception of fair prices varies depending on where in the chain the actor is embedded. For secondary processors they perceive that the producers have the power to influence higher spot prices.

In the interviews with stakeholders these allegations were discussed in the context of fairness and it was stated on the contrary that it was unlikely that large companies would have the power to influence the spot market prices. However, it may appear unfair that the volatile prices on the spot market are not reflected in retail prices. Thus it appears that the secondary processors may be the ones that are suffering when prices are high. They have a weak bargaining position against retailers and very little power. Retail chains normally operate with fixed gross 'mark-up' (30 – 40 %). Consumers resistance of high prices then turns back to suppliers (secondary processors). Secondary processors take what they can get, i.e. when spot prices on raw material goes up, margins of secondary processors go down- because retail normally operate with fixed price contracts for 3 – 6 months. For more shelf stable goods – they have contracts of 1 year. It appears that the independent secondary processors may be at risk of being further marginalized by the retailers or the large vertically integrated production companies.

- *"Retail sell on fixed margins – removing products not having good enough turnover. So, the pressure is on value added processors to come up with new innovative products which become favored by the consumer. MAP packaging, however, was driven forward by English supermarket chains, mainly to improve shelf life and by*

[103] https://www.theguardian.com/uk-news/2019/feb/20/eu-raids-salmon-farmers-in-scotland-in-price-fixing-inquiry

that reduce spill due to best before date". (Norwegian salmon business expert, March,2019)

7.5.3 REGULATORY INTERVENTIONS

Salmon aquaculture is, a good example of how governance and regulation can influence industry growth. Norway's production has increased by 115% during the period 2005-2015, while production has not expanded at the same rate in Chile (53%), UK (38%), and Canada (25%) for different reasons (e.g. regulatory framework not efficient and safeguard measures inadequate towards externalities like diseases when production and stocking density increased) (Osmundssen et al., 2017)[104]. In UK, stagnation in aquaculture growth has been explained by the constraints in obtaining further licenses to increase production capacity. The management and regulation of aquaculture is a complicated issue both from the perspective of fish farmers as well as regulators This is because of uncertainty and lack knowledge with respect to the externalities of aquaculture production; e.g., diseases, environmental impacts, and conflicts with other user interests (Osmundsen et al., 2017)[104]

The role of government and regulatory bodies is to provide a stringent regulatory framework and ensure compliance.

- "*the system is transparent and everybody can get access. Regulations are the backstop. Voluntary control by the industry is favored where the standards are an important part of the industry's transparency. Standards and audit reports are public e.g. ASC, but not all standards provide monitoring records (e.g. Welfare standards). Standards and auditing is a whole business by itself and way above the regulatory requirements" (Interview, UK producer, March 2019)*
- *So far, no single large company is dominating the market. The biggest player MOWI have a domestic market share of some 15 – 18 % in Norway, and approx. 10% in the global market. Federal regulations are introduced to prevent monopoly or oligopoly structures in the industry. (Norwegian salmon business expert, Feb 2019)*

The rules of the Competition Act concerning the control of the amalgamation of business enterprises represent a limit for how much market power an industry player can obtain through the merger of business enterprises, cf. Chapter 5 of the Competition Act[70]

7.5.3.1 Social license as part of governance

In recent years, environmental challenges and conflicts linked to aquaculture production have led to the emergence of the 'social license', a form of tacit public acceptance, trust and goodwill concerning operations that must be obtained by producers (Baines & Edwards, 2018; Murphy-Gregory, 2018; Mather & Fanning, 2019). It can be considered to be a component of Corporate Social Responsibility (CSR), but has broader ramifications. Whereas CSR address the issues of sustainability largely as a branding exercise for the purposes of attracting and retaining consumers and suppliers, the social license is more concerned with the acceptability of socio-economic, socio-cultural and environmental impacts in a local context. As such, it is debatable whether the social license constitutes part of the structure of governance, but it is certainly a feature of 'good governance' and its manifestation may

[104] Osmundsen, T. C. Almklova, P. and Tveterås, R (2017) Fish farmers and regulators coping with the wickedness of aquaculture. Aquaculture Economics & Management, DOI: 10.1080/13657305.2017.1262476

be impacted by the governance model in ways that are poorly understood at the moment. Vince & Haward (2017) contend that hybrid forms of governance have become more common in aquaculture, especially salmon production, and that the influence of community power must be considered in relation to this form of governance structure. Several examples of messages related to the strengthening of local, rural communities (maintenance of schools and doctor's surgery) with the presence of a fish farm have been posted on YouTube and other social media, most probably looking to raise awareness and increase acceptance of the activity from a "social tissue" perspective.

The meeting of ambitious growth targets in Scottish salmon production is likely to require improvements to the social license and the effects on public acceptability of competing marine industries, such as tourism and renewable energy generation (Billing, 2018). However, little research on impacts to the social license has been undertaken in this regard, partly it seems due to challenges in obtaining transparent information of relevance to the social license 'negotiation' between companies and communities (Billing, 2018). A recent study by Mather & Fanning (2019) highlighted that future social license research in the context of aquaculture needs to not only understand market power, regulation and governance structure, but in order to fully understand the social license concept and how this is negotiated, focus on the following: (1) social network analysis (a form of stakeholder mapping) and dynamics over time; (2) industry sustainability initiatives and their development over time; (3) the use of quantitative and qualitative surveys to measure the social license in aquaculture; and (4) the effects of the social license on certification for farmed fish and the acceptability of these standards to local communities.

7.6 CONCLUSIONS

The inter-firm relations of producers and their buyers are characterized by free market exchanges where products are sold on the spot market, however, there is a trend of long-term contracts, in particular between large integrated companies and retail or large secondary processors. "**Market**" governance is thus applicable for salmon producers and primary processors who are selling commodity products on the spot market, where transactions are easily codified, suppliers are capable of making products based on technical standards and there is no input from buyers. The specifications are based on industry standards and the complexity of information exchanged is low, and therefore transactions need no explicit coordination. The standards facilitate transactions since information about the products and their specifications according to best aquaculture practices can be codified. The essential point is that the costs of switching to new partners are low for both parties. This is typical of free market exchanges where buyers respond to specifications and prices are set by sellers (Gereffi *et al.,* 2005).

The linkages between secondary processors and retailers can be characterized as modular or relational, for example, when producing a differentiated branded product. "**Relational**" linkages emerge if a product specification is hard to codify, transactions are complex, and supplier capabilities are high, with trust and reputation built up over time. "**Modular**" linkages are distinctive in that they are based on codified knowledge rather than on prices, and suppliers take full responsibility for the process technology. Secondary processors (e.g. filleting and smoking) are stuck in the middle of the chain,

and are reliant on farmers / primary processors or wholesalers for raw materials which they buy on the spot market. They are vulnerable when prices on the spot market are high and have little influence when negotiating the price with retailers, who normally operate at a fixed margin.

A "**Hierarchy**" governance is characterized by high incentives to centralize control of strategic investments and this is typical for the vertically integrated large companies of the salmon value chain, who mainly target high-end retailers. The increasing number of requirements from large retail chains has been a main driver of the vertical and horizontal integration of aquaculture companies as well as the food industry globally. The objective has been to increase the negotiation power of retailers with respect to price, product, and volume.

The salmon value chain governance is influenced by network governance, contracting and informal relationships, and the governance structure is best described as a "**Hybrid**" form. The large integrated firms and their subsidiaries constitute a network of firms that organize their transactions through a combination of different arrangements. This is characteristic of plural hybrid forms whereby a firm (or a network of firms) could partially produce in-house (or distribute through its own outlets), outsource other parts of its activity through contracts with specific firms, and possibly use spot markets, all at the same time (Menard, 2017).

Price is considered to be one of the most important factors that will increase a supplier's perception of fairness. The interviews with agents across the salmon value chain suggest that producers are satisfied with the value distribution, in particular with respect to the current high prices of salmon, while secondary producers and feed producers are less content.

The result of the governance analysis is general for the salmon supply chain and the main outcome concerns the levels of complexity found in inter-firm relationships. Further in-depth studies on individual companies (large vs small) and their relations with buyers (secondary producers, retail, wholesale) in different countries e.g. France, Poland and the Netherlands, would be of interest to better understand the specifics and dynamics of decision making in the salmon business.

7.6.1 KEY QUESTIONS

1) From your perspective, what are the areas where the working of the value chain is unfair?

2) Is value distributed fairly to all actors in the chain?

3) Which actors in the value chain hold the most power and why, in your opinion?

4) How is power exercised in the value chain? and how do actors respond to this?

5) What role do government (agencies) and industry/oversight groups play in these power dynamics?

6) Do you feel decisions made across the chain are sufficiently transparent? (e.g. what access do actors have to information that helps them make decisions)

7) Do governance measures/policies support fairness and transparency across the value chain? – Could these be improved?

8) How would you characterize the levels of trust and collaboration between actors? – Could these be improved?

7.6.2 STAKEHOLDER INTERVIEW LIST

- Norwegian salmon business expert, Nov 2018 and March 2019
- Scottish Salmon producer organization, March 2019
- Icelandic salmon producer, April 2019
- Norwegian feed producer, May 2019
- Discussions on the key questions with stakeholders by SINTEF and UoI in workshops, meetings and conferences.

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8. GOVERNANCE OF NORTHERN ITALIAN TOMATO TO PROCESSED TOMATO VALUE CHAIN

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8.1 OVERVIEW OF EU PROCESSED TOMATO PRODUCTION AND TRADE

At global level, the market trend for processed and unprocessed tomato is negative (-2,1%). Italy, Spain and Portugal are the biggest processed tomato producers in the EU and account for 94% of tomato production for processing (European Agricultural Outlook for the Agricultural Markets and Income 2017-2030). However, al tomato markets (puree, pulp, paste, pomodorini, etc.) are negative. Production of processed tomato (processing stage) decreased -15% in 2018 at European level and -10% globally. In Italy, production of processed tomato decreased -11.5% compared to 2017. China produced about -40% of processed tomato compared to the previous season and Spain and Portugal together about -20% less (ANICAV 2018, 22 October 2018).

8.1.1. EU PRODUCTION OF PROCESSED TOMATO

Italy, Spain and Portugal are the European countries with the highest production of processed tomato.

Italy is the second largest producer of processed tomato worldwide after the USA (30% of global production), representing 13.6% of the global production and 49% of EU production, with a turnover of 3.15 billion Euros, from which 1.1 billion Euros derive from exports (ANICAV 2018). Italy is the first exporting country of finished processed tomato products in the EU, showing increasing export numbers in the first semester 2018 of +11.2% in volume and of +7.69% in value (ANICAV 2018). Italian production of processed tomato amounted to 4.65 million tons in 2018 (-11.5% compared with 2017), with a reduction of -12.7% in the Southern production region and of -10.2% in the Northern production area (ANICAV 2018). Production of tomatoes for processing in Italy, as well as in Spain and Portugal, is locally concentrated. In Italy, processing tomato production is divided between a Northern production area (mainly Emilia-Romagna region) and a Southern production area (mainly Campania and Puglia).

Spain is the second most important producer of processing tomato in the EU (8% of global production in volume, around 25% of EU production in volume). Also, in Spain, tomato production is concentrated in three main regions, where also the tomato processing companies are located: Extremadura (62% of the total volume), Andalusia (28% of the total volume), and Ebro Valley (7% of the total volume). In 2017, Spanish

processing tomato was produced on 35,943.083 hectares (MAPA 2017), with an average production of 92 t/ha. More than 75% of the Spanish tomato products are exported, the EU is the main destination market, main product is tomato paste, followed by canned tomatoes and tomato sauces (AMITOM, December 2016). Tomato production in Spain dropped -22% in 2018. Extremadura, the largest producing region, dedicated 22,000 hectares to the cultivation of processing tomatoes (-3,000 compared to 2017), which was mainly caused by adverse climatic conditions (Tomato news 2.08.2018, Acopaex 2018).

Portugal is the third producer of processing tomato in the EU (4% of global production). In Portugal, processing tomatoes are mainly produced in the plains of the Tejo river (Ribatejo), where 90% of the crop is grown. The remaining 10% is produced in the south-eastern region Alentejo (AMITOM, December 2016). In 2015, the volume produced in Portugal reached 2.6 million tons (+15% compared with 2014). There are 6 tomato-processing companies in Portugal; three of them are among the biggest in Europe. Tomato paste is the main product, but recently the production of crushed and chopped tomatoes has grown, especially for export (AMITOM, December 2016).

Figure 8-1 represents the production of tomatoes for processing for the three main EU producing countries Italy, Spain and Portugal at farm level for the period 2012-2018f (forecast) and the trend for EU 28 with a decreasing production for 2017/2018.

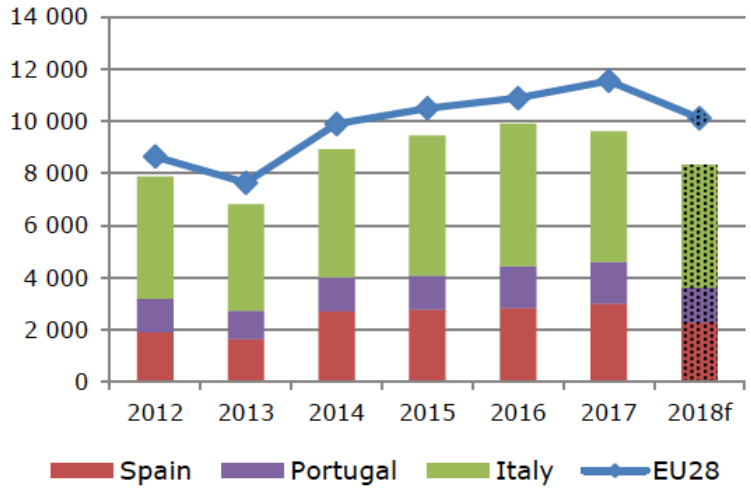

Figure 8-1 EU Production of Tomatoes for Processing (1000 T) (at farm level).

Source: European Commission, DG Agriculture and Rural Development (2018): Short-term outlook, No 21, Summer 2018;
2018f: forecast data

8.1.2 EU TRADE OF PROCESSED TOMATO

Total EU exports of processed tomato in 2018 (forecast) reached 2.2 million tons (Table 1), which means a decrease of -14.6% over the period 2018/2017 as can be seen in Table 2. Total EU imports of processed tomatoes were 2.6 million tons (Table 1), which is an increase of 15,8% for the period 2018/2017 (Table 3). EU consumption of processed tomatoes was 21.9 kg per capita in 2016 and 2017; 2018 forecast is 20 kg per capita (Table 2). Consumption decreased -8.7% in 2018f/2017 but is expected

to grow, driven by higher demand as an ingredient for convenience foods and other food products that evoke a Mediterranean lifestyle (European Agricultural Outlook for the Agricultural Markets and Income 2017-2030).

Table 8-1. EU Processed Tomatoes Balance Sheets (1000 t) 2012-2018f

	EU-28						
	2012	2013	2014	2015	2016	2017	2018f
Production (total fresh and processing)	15 191	14 534	16 692	17 766	18 005	18 543	17 089
EU supply for processing	8 637	7 639	9 890	10 485	10 882	11 537	10 083
Exports (processing)	2 198	2 477	2 243	2 393	2 636	2 576	2 200
Imports (processing)	2 621	2 171	2 280	2 537	2 967	2 245	2 600
Consumption (processing)	9 060	7 333	9 927	10 629	11 212	11 206	10 483
Per capita consumption (kg)	18	14.5	19.5	20.9	21.9	21.9	20

Source: European Commission, DG Agriculture and Rural Development (2018): Short-term outlook, No 21, Summer 2018

2018f: forecast data

Table 8-2 EU Processed Tomatoes Balance Sheets (1000 t), Variation %.

	% Variation			
	17/16	%5yr.av	18f/17	%5yr.av
Production (total fresh and processing)	3.0	12.0	-7.8	-2.3
EU supply for processing	6.0	19.3	-12.6	-3.2
Exports (processing)	-2.3	8.6	-14.6	-11.4
Imports (processing)	-24.3	-9.5	15.8	10.5
Consumption (processing)	-0.1	13.5	-6.5	-1.0
Per capita (kg)	0.0	12.5	-8.7	-3.7

Source: European Commission, DG Agriculture and Rural Development (2018): Short-term outlook, No 21, Summer 2018

2018f: forecast data

Focus on Trade of Tomato Paste, Puree, and Canned Tomatoes

This paragraph focuses on the global market shares of the main producing countries for specific processed tomato products, particularly on the trade of tomato paste and canned tomatoes. **Error! Reference source not found.** shows the global market s hares for tomato paste and canned tomato for the period 2016/2017 for the main 15 exporting countries in the case of tomato paste, and for the main 8 exporting countries for canned tomatoes.

Tomato Paste, 2016/2017: Global Market Shares of the Main 15 exporting countries to the 26 importing regions

Canned Tomatoes, 2016/2017: Global Market Shares of the Main 8 Exporting Countries to the 26 importing regions

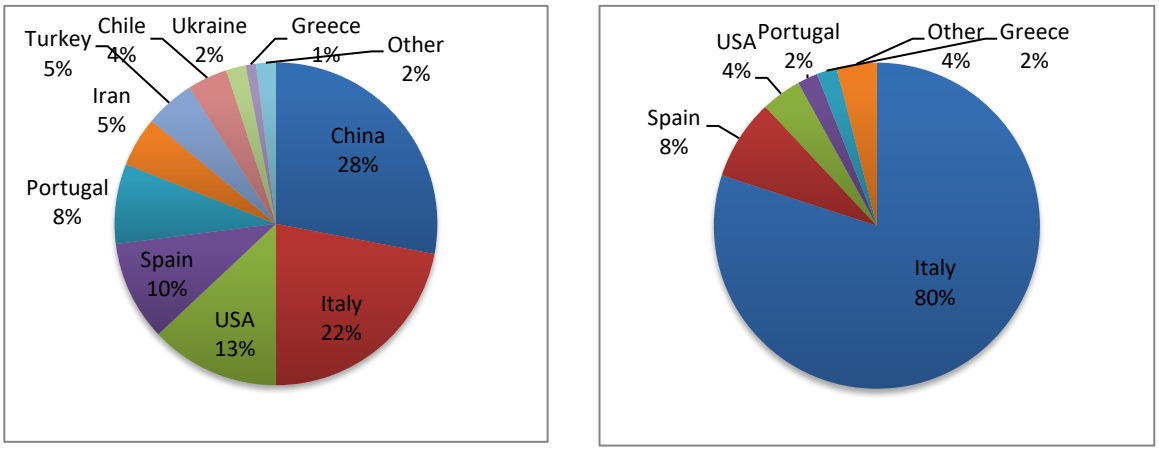

Figure 8-2 Tomato Paste and Canned Tomatoes Global Market Shares of Main Exporting Countries to main importing regions

Source: Tomato News Dossier, 2017 (http://www.tomatonews.com/en/trade_46.html)

EU Exports of Tomato Paste

Regarding tomato paste, 15 countries supplied 97% of the worldwide supply of tomato paste in 2016/2017 (3.2 million tons). Italy is the second most important supplier of tomato paste to the 26 main importing regions with a market share of 22% right after China (28%) and before the USA (13%)(Figure 2) (Tomato News Dossier, 2017). Italy exported 692,987 tons of tomato paste (volume, finished product) in the period 2016/2017, Spain exported 321,015 tons of tomato paste (volume, finished product) in 2016/2017, and Portugal exported 255,745 tons in 2016/2017 (Tomato News Dossier, 2017). Figure 3 shows the performance of the main tomato paste exporting countries in volume (tons) for the period 2014-2017.

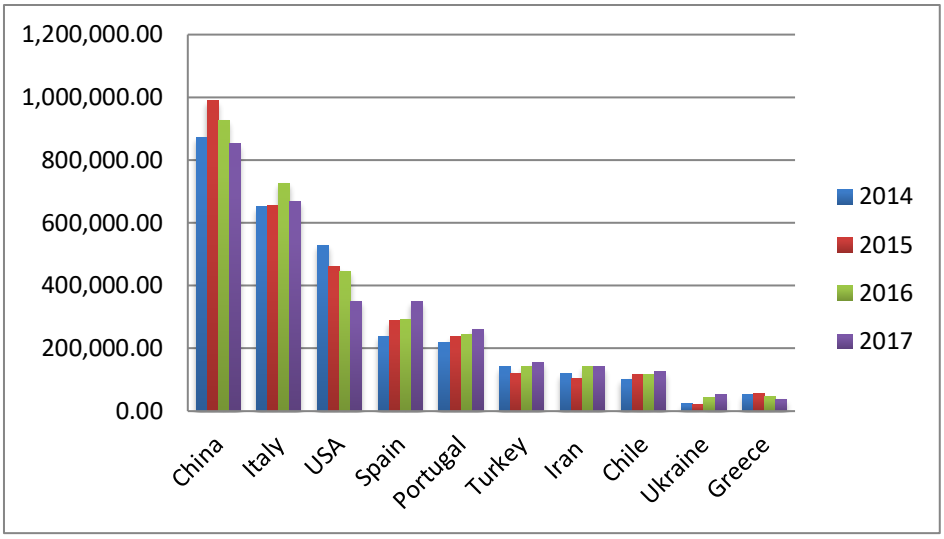

Figure 8-3. Performance of main Tomato Paste Exporting Countries, volume (t)

Reporting Countries Export Statistics (Partner Country: World) Commodity: 200290, Tomatoes (other than whole or in pieces) including paste and puree

Source: Tomato News, 11 July 2018

EU Exports of Canned Tomato

Italy is the leading exporter of canned tomatoes in the world, accounting for an 80% global market share of the main 8 exporting countries to the 26 main importing regions for the season 2017/2016 (Figure 2) (Tomato News Dossier, 2017). Italy exported 1.3 million tons worldwide. The second largest exporter of canned tomato in the EU is Spain with 124,000 tons traded in 2017. Spain does not have a strong canned tomato industry and most of the production for retail is for national internal consumption. Exports of canned tomato from Portugal increased for the third consecutive year to 36,272 tons in 2017 (+13% y-o-y) (IEG Vu Canned and Tomato, 2018).

8.1.3 Italian Tomato Sales and Consumption

Internal Italian consumption showed decreasing market shares of processed tomato products for the period September 2018/September 2017: -7.2% for whole peeled tomatoes, -4.6% for tomato pulps, and -2.1% for tomato paste, which remains the top selling product, and market shares of “pomodorini” remained stable (ANICAV, 3 December 2018).

Regarding sales at retailer level, Figure 8-4 shows the percentage in sales of different tomato product categories at retailers in volume in 2016. The biggest category with 53% is tomato paste, followed by pulps/chopped tomato with 22%, and peeled tomato with 13%. Tomato sauces had a share of 9%, and the smallest category, pomodorini, had a market share of 3%. Compared to 2015, processed tomato sales at retail level remained quite stable in volume (+0,3%) and value (-0,4%) for the period 2016/2015 (Ismea, 2017). Best performance within the processed tomato category showed tomato sauces (+5,1% in volume and value) and tomato paste (+1,1% in value and +3,1% in volume), canned whole small tomatoes (pomodorini) +0,9% in value and +3,8% in volume. Sales decreased for whole peeled tomatoes (pelati) (-10% in value and -6,4% in volume), and for pulps (-3,2% in value and -3% in volume) (Ismea, 2017).

In addition, information obtained through an interview with a major Italian retailer has revealed that the value sales of promoted products is high. To date, 39% of processed tomatoes purchased in Italy are on promotion.

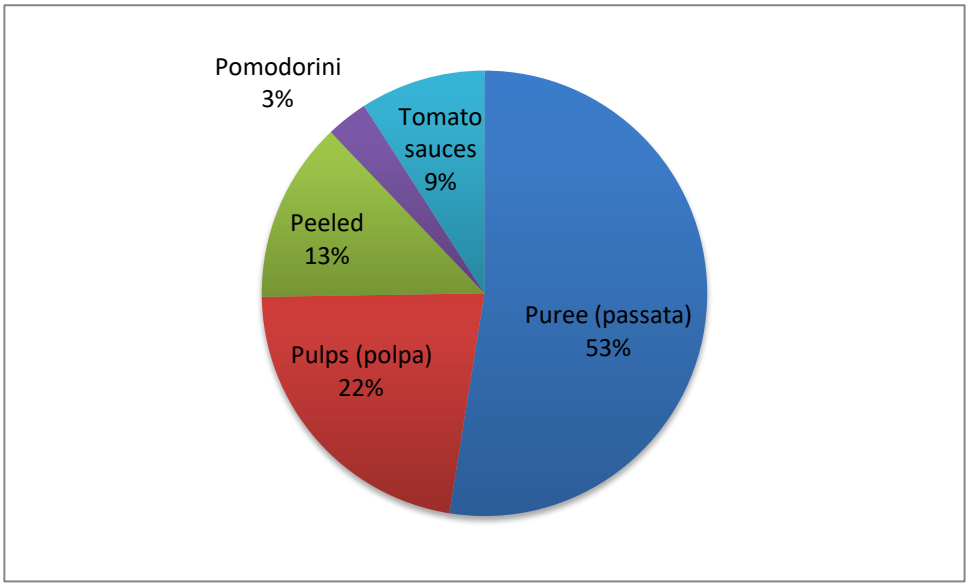

Figure 8-4 Sales of Different Tomato Product Categories at Retailers in Italy, % Volume, 2016.

Source: ISMEA (2017) data elaboration on Nielsen Market track

8.2 PROCESSED TOMATO VALUE CHAIN IN ITALY AND EMILIA-ROMAGNA

Production of tomatoes for processing in Italy is concentrated in two main areas – the Northern production area and the Center-Southern production area. The production of tomatoes for processing is entirely separate from the fresh tomato market. One reason for this is that the two industries use completely different tomato varieties and production methods (European Agricultural Outlook for the Agricultural Markets and Income 2017-2030).

In Italy in 2018, a total of 60.500 ha (-6% compared to 2017) were dedicated to the production of tomatoes for processing.

Figure 8-5 shows the share of the North Italian and Center South Italian production on the total national production in 2018. 2.45 million tons (53%) of processed tomato was produced in the Northern production area, and 2.20 million tons (47%) in the Center-south production area (ANICAV 2018).

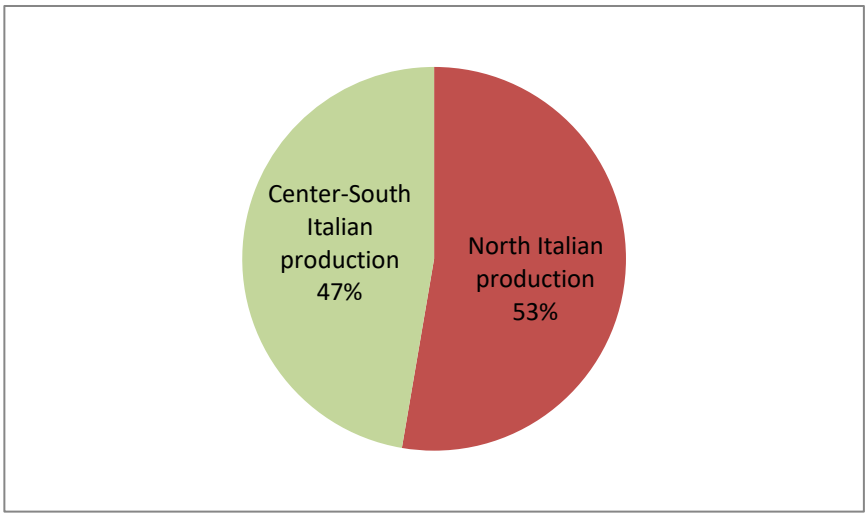

Figure 8-5 Production of Processed Tomatoes in North and Center-South Italy, volumes million tons and percentage %.

Source: ANICAV 2018

Conditions in Italy allow for production of processing tomatoes throughout the year, although the major part of processing takes place between the month of July and December (Bettini 2016). The Italian tomato processing industry produces mainly four different types of processed tomato products: tomato puree (passata), pulp/chopped tomato (polpa), tomato paste (concentrato), and whole tomato (pelati) (ANICAV 2018).

The main agents in the value chain and the general structure of the Northern and Southern production area are similar, but organization, governance and functionality of relationships between the members (growers, POs cooperatives, processing companies, retailers) vary significantly. The case study (CS) will focus only on the North Italian production area for processing tomato covered by the Inter-branch Organization North Italy for Processing Tomato (IBO North Italy Processing Tomato). This will be explained in detail below in paragraph “Levels of aggregation in the tomato case study”. Flowingly we will refer to the area studied for the tomato CS as IBO North Italy Processing Tomato.

8.2.1 Tomato Production

The processing tomato production in the Northern production area amounted to 35.099 hectares in 2018 (IBO North Italy Processing Tomato, July 2018) (Table 8-3). In the Northern production area the present 1.860 tomato growers are organized into 15 Producer Organizations. Tomato cultivation is located mainly in the North Italian regions Emilia-Romagna (68.78%), Lombardy (20.82%), Piedmont (5.84%), and Veneto (4.01%). Also within the regions, processing tomato cultivation is concentrated locally, mainly in the provinces of Piacenza, Ferrara, and Parma (Table 8-3). The average farm size in the IBO is 18.78 ha.

Table 8-3 Tomato Production in the IBO North Italy Processing Tomato, hectares and %.

	Area (ha)	Percentage (%)
Emilia-Romagna	24.140	68,78
Lombardy	7.307	20,82
Piedmont	2.049	5,84
Veneto	1.406	4,01
Others	197	0,6
Total	35.099	100

Source: IBO North Italy Processing Tomato, 18 July 2018

Table 8-4 represents the production area in hectares dedicated to tomato production in the single provinces of the IBO North Italy. As can be seen in the numbers, also within the IBO area, production in concentrated locally to a limited number of provinces.

Table 8-4 Tomato Production in Single Provinces of the IBO North Italy Processing Tomato, ha.

Province	Production (ha)	Percentage (%)
Piacenza	9.962	28
Ferrara	5.703	16
Parma	4.293	12
Mantova	3.775	11
Cremona	2.073	6
Ravenna	2.019	6
Alessandria	1.856	5
Reggio Emilia	1004	3
Modena	763	2
Verona	727	2
Rovigo	564	2
Others	2360	7
Total IBO	35.099	100

Source: IBO North Italy Processing Tomato, 18 July 2018

Regarding the production method, 93.4% of tomato cultivation is conventional105, 6.6% is organic production (IBO North Italy Processing Tomato, 18 July 2018). Table 8-5 gives and overview of the shares (%) of conventional and organic production for single tomato varieties in 2017.

Table 8-5 Production (ha) according to Tomato Varieties and Production Methods in the IBO North Italy Processing Tomato %, 2017.

Tomato varieties and production methods	%
Conventional round	92.2
Conventional long	0.6
Conventional Pomodorino	0.5
Total Conventional [1]	93.4
Organic round	6.5
Organic long	0.1
Total Organic	6.6

Source: IBO North Italy Processing Tomato, 2017a

8.2.2 TOMATO PROCESSING

The processed tomato produced in the IBO North Italy Processing Tomato represents around 50% of the Italian processed tomato production and 25% of processed tomato production in Europe. There are 22 tomato-processing companies, which process 98,9% of the tomato produced in the area of the IBO North Italy Processing Tomato (IBO North Italy Processing Tomato, July 2018). Tomato processing is concentrated in Parma province, with more than half of the private processing companies, and half of the processing producers' cooperatives located there (Mantino & Forcina, 2018).

Tomato processing is partly done in private companies and partly in producers' cooperatives. Producers' cooperatives processing their own tomato account for 34% of processing activity. 66% are processed in private processing companies. The largest private processing companies are located in Parma and Piacenza, such as Mutti, Rodolfi, Greci Alimentari, and Emiliana Conserve. A characteristic of these private companies is that they still belong to the founder families (Mantino & Forcina, 2018).

Figure 8-6 represents the main processed tomato categories produced in the IBO North Italy. The three main categories are pulps, pastes and purees: the biggest product category is pulp/chopped tomatoes with a share of 36.57%, followed by tomato

[105] In case of the Processing Tomato Production in Emilia-Romagna "Conventional" means to be produced according to a specific production disciplinary in line with the regional brand "Controlled Quality" (Qualità Controllata, *Regional Act no. 28/1999) see Table 12 on EU Policies and regulations*

paste with a share of 32.52%. Tomato puree has a share of 28.63%. The remaining categories are tomato sauces, flakes and frozen account only for around 3,4%.

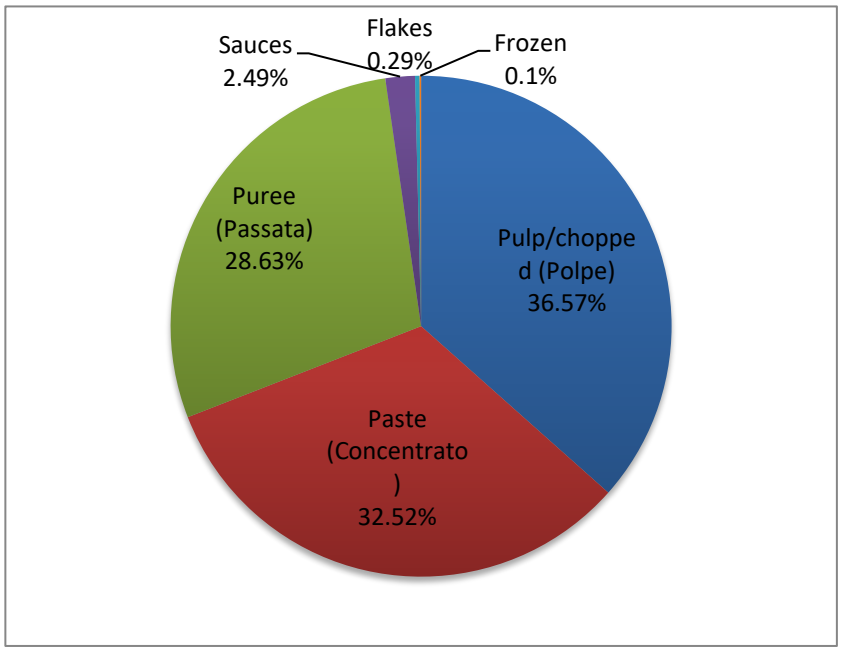

Figure 8-6 Finished Processed Tomato Production in the IBO, % Volume (2018)

Source: Tomato News 23 November 2018 (data received from IBO North Italy Processing Tomato 2018)

More than half of the processed tomato goes to food industry (52.5%), 30.9% goes to retail distribution, and 16,7% to HORECA (IBO North Italy Processing Tomato, 2017) (Figure 8-7).

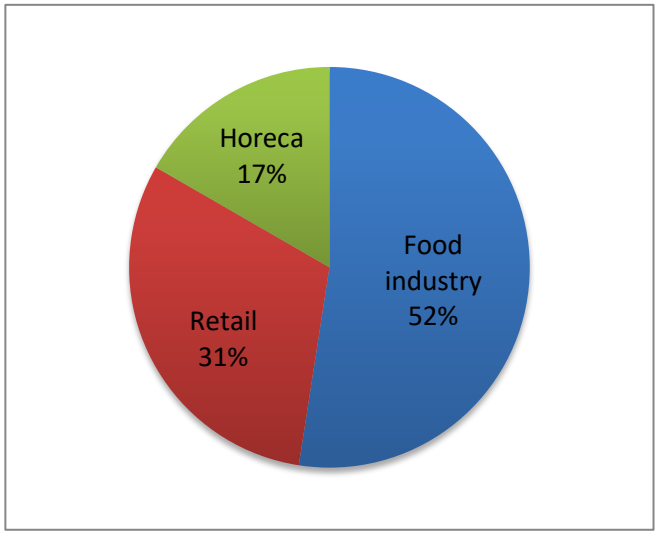

Figure 8-7 Distribution Channels for the Processed Tomato of the IBO North Italy Processing Tomato

Source: IBO North Italy Processing Tomato, 2017a

Figure 8-8 shows the importance of the single processed tomato product categories, according to the three distribution channels: retail, food industry and Horeca for 2017 (latest available data). As can be seen in Figure 8, tomato paste is the most important processed tomato product for the industry channel, whereas on retailer level, tomato puree is the most important product, and for Horeca it is tomato pulp.

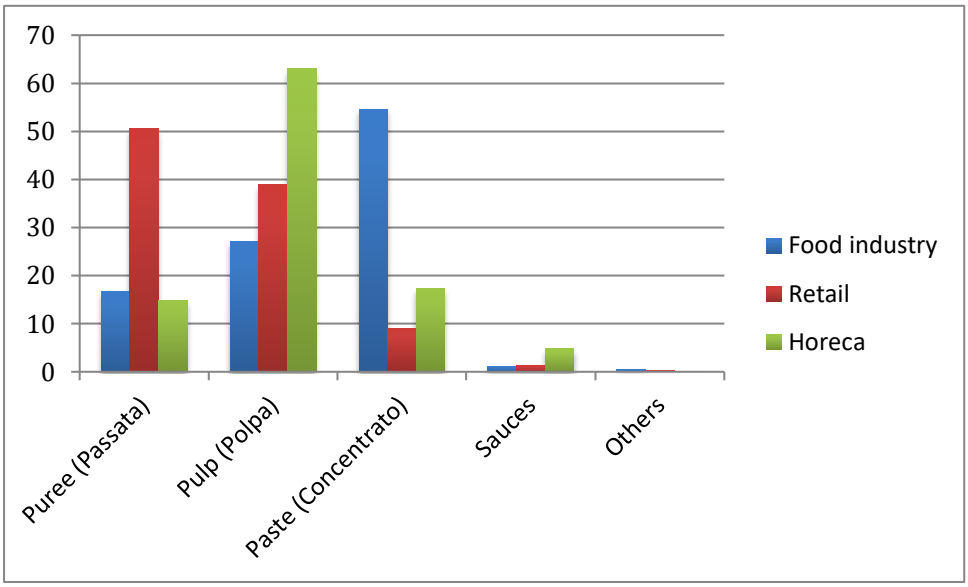

Figure 8-8 Breakdown of Raw Material processed for Food Industry, Retail and Horeca in the IBO North Italy Processing Tomato. Source: Tomato News 07 November 2017

8.3. VALUE CHAIN ORGANIZATION: THE CASE OF THE PROCESSED TOMATO

The processing tomato value chain of IBO North Italy Processing Tomato is particularly structured, locally concentrated and characterized by a specific governance system guaranteeing both vertical and horizontal cooperation, coordination within the value chain, and production and processing adaptation to environmental and economic sustainability requirements (Mantino & Forcina, 2018). The processing tomato production chain is a localized agro-food system, characterized by geographical proximity, long and consolidated relations between agricultural production and local industry, and a distinctive governance system influencing the economic performance at the local level. The system is based on strong local governance arrangements ensued from the development of new organizations and rules and contractual agreements between producers and processors of the tomato supply chain (Mantino & Forcina, 2018).

Processing tomato production in the IBO North Italy Processing Tomato concerns different levels of aggregation.

8.3.1 GOVERNANCE LEVELS

Level 1 - Single companies and cooperatives (both producers and processors)

Some of the companies that are present both in the production and processing stage of the value chain are registered as cooperatives, others are single private companies. Producers' cooperatives processing their own tomato account for 34% of processing activity of the northern value chain. 66% are processed in private processing companies. The largest private processing companies are located in Parma and Piacenza, companies such as Mutti, Rodolfi, Greci Alimentari, and Emiliana Conserve. These private companies still belong to the founder families and represent nearly 50% of the entire tomato processing of the northern production (Mantino & Forcina, 2018).

Level 2 - Producer Organizations (PO) (relevant for the production stage of the chain)

The Producer Organizations are recognized and regulated by the EU (Reg. EU 1234/2007, Reg 1308/2013) as part of the European Common Agricultural Policy (CAP). They have an operative function, dealing with:

- Negotiation, bargaining, programming with the processors,
- Collection of payments,
- Mutualism (if a producer does not receive a payment, solidarity mechanisms are activated),
- Controls of the disciplinary of production.

Agricultural production of processing tomato in North Italy, particularly in Emilia-Romagna, is characterized by a cooperative culture. Cooperation is well developed at the producer's level: tomato producers are members of local and/or interregional POs or of cooperatives that produce and process tomatoes. POs make collective purchases of means of agricultural production, give technical assistance and advisory to their members, and sell collectively to processing industries. POs played a decisive role

since the 1980s. POs lead negotiations with the processing industry, organize collective purchases of production inputs, offer consultancy services and technical support. In 2007, stakeholders decided to set up the association "District of Processing Tomato", a union of POs, processing companies, local institutions, and local research centres. In 2011, the district evolved into the Inter-branch Organization North Italy for processing tomato (Mantino & Forcina, 2018).

Level 3 – The Interbranch Organization Processing Tomatoes of Northern Italy (IBO North Italy Processing Tomato)

The IBO North Italy Processing Tomato is based in Parma and recognized by the Italian Ministry of Agricultural, Food and Forestry Policies (Decree Law from May 2nd 2017, published in the Official Gazette of the Italian Republic from May 23rd 2017). Regional territories included in the IBO North Italy Processing Tomato: Emilia-Romagna, Lombardia, Piemonte, Veneto, Provincia Autonoma di Bolzano. Product: tomatoes for processing. The IBO North Italy Processing Tomato includes the Producer Organizations, the Processing Companies, the cooperatives, the Professional Organizations and Entrepreneurial Associations. Distribution and retailing is not part of the IBO North Italy Processing Tomato. Single producers are not present in a direct way, as they are represented by the POs. Professional Organizations present in the IBO North Italy Processing Tomato are mostly entrepreneurial associations. The IBO North Italy Processing Tomato includes the vast majority of companies active in the tomato sector in Northern Italy. The IBO North Italy Processing Tomato is the lead actor in the coordination of production and processing in the North Italian processing tomato value chain. The IBO North Italy Processing Tomato does not intervene actively in trade negotiations (e.g. prices, volumes etc.) within the value chain, but exerts a key influence on market stabilization and organization. *"The IBO North Italy Processing Tomato can in no way take part in the price negotiations for raw tomatoes, their mission is to promote the integration process of the industry by improving products, ensuring careful programming and concerted planning, and supervising compliance with the rules and agreements. The main aim of the national coordination that will be set up between the two North Italy Processing Tomato [106] will be to provide a single track for the industry as a whole" (Tomato News, 4 December 2018, General Director of ANICAV).*

Decision making within the IBO North Italy Processing Tomato

Decisions are adopted by a majority of three-quarters of the ordinary members. Decision-making power is allocated 50% to producers and 50% to processors and each single member's votes have a weight proportional to its productive weight (Mantino & Forcina, 2018). The Organization manages relationships between producers and processing firms, acts as a guarantor of the respect of the agreed rules, monitors the obligation to use only tomato produced in the area, supports producers and processors to manage the general framework contract and the reference price agreed, handles the exchange of data concerning the tomato campaign, such as origin, quality, and quantity of tomato (IBO North Italy Processing Tomato Statute 2017).

[106] IBO North Italy Processing Tomato, accredited March 2017, and IBO South Central Italy, accredited November 2018

The power inside the IBO North Italy Processing Tomato in terms of votes is equally distributed between Producers and Processors. Table 8-6 shows details of the distribution of votes among different members of the IBO.

Table 8-6 Distribution of votes among members of the IBO North Italy Processing Tomato.

Producers (n. votes)		Processors (n.votes)	
Professional organizations	20	Entrepreneurial associations and representatives	20
Cooperatives	22	Cooperatives	48
Producer organizations	158	Processing companies	132
Total	200 (50% of the total)	Total	200 (50% of the total)

Source: IBO North Italy Processing Tomato Statute, 2017b

According to the objective of the IBO North Italy Processing Tomato, the integration of the value chain is fundamental for maintaining and improving competitiveness of the tomato growing and processing industry (ANICAV 2018).

8.3.2 COMMERCIAL RELATIONSHIPS

Processed tomato is produced on a contractual basis. Tomato production and commercial relationships within the IBO North Italy Processing Tomato are regulated by general rules of a Framework Contract and specific contractual conditions set in detailed supply contracts between producers and processors, and between producers and self-processing cooperatives (e.g. no pesticide residues or chemical ingredients, brix level, consistency, flaws, etc.).

The framework contract of IBO North Italy Processing Tomato

The aim of the framework contract *(IBO 2018, Contratto Quadro Area Nord Italia Pomodoro da Industria Raccolto 2018)* is to create synergies in the processes of programming and qualification of the tomato producing and processing industry. Goal of the framework contract is to orient tomato supply and demand and to adapt production to market development. Therefore, parties commit to make data and information available that allows for a better understanding of market developments. Producers and processor agree to communicate production and sales data to the IBO North Italy processing tomato, from which the IBO North Italy processing tomato will conduct economic analysis, market research and statistical elaborations to the benefit

of all members (e.g. protect profitability of producers, optimize production costs, balance market conditions, and correct programming of investments in production). Furthermore, the IBO North Italy processing tomato provides research activities, technological innovation, and experiments aiming at social, environmental and economic sustainability of the processing tomato value chain.

Production

The framework contract regulates in detail production and delivery of produced tomatoes in the area of IBO North Italy processing tomato:

- Programming of production (e.g. hectares and yields, production methods, certifications),
- Quality and sanity characteristics of the produce,
- Contract conditions and respect of production regulations.

Trading

All trading takes place between the members of the IBO North Italy Processing Tomato, except for a limit of 10% of the tomato under contract within the IBO North Italy Processing Tomato. Respecting of quantities and qualities agreed in the contract has the objective to guarantee prices and incomes to the producers. A premium and penalty on price method is used as an incentive/deterrent against misconduct. Non-compliance with the set rules on quantity and quality is penalized, ranging from fines to exclusion from the IBO North Italy Processing Tomato. Single producers are not allowed to contract directly with processing industries outside of the POs. All negotiations between production and processing industry are channelled through the POs. Processors cannot contract with POs that have been excluded from the IBO North Italy Processing Tomato for not respecting the rules, and vice versa, POs cannot supply processors that have been excluded from the IBO North Italy Processing Tomato.

Price agreements

Official rule is that the framework contract has to be drawn up by the 31st January of every season to allow for a suitable planning of production. The price agreement was fixed between POs and the processing industry. The processing industry is represented by their industry organizations ANICAV and Confapi Industria. One new element of the three-year framework contract 2018-2020 is that the IBO North Italy Processing Tomato gathers and elaborates production and processing data from producers and processors and then provides aggregated and anonymous market data to the members. Thus, trading and price setting can be based on analytical and objective elements from previous campaigns. The approximate price will be ratified in the single delivery contracts that will be set up between the single POs and processing industries. One novelty of the 2018 agreements is the introduction of a premium for quality equal to 1,00 €/t for produce with a Brix value between 4,8 and 5,2. There will also be a penalty for produce with less Brix degrees. 2019 agreement confirmed this approach. This is considered an important aspect, because it helps one of the major objectives of the IO, which is to further increase the quality of the tomato production of the district.

Supply contracts

The IBO North Italy Processing Tomato framework contract sets the general rules, whereas for actual trading specific supply contracts between POs and processing companies detailing quantities and prices will be set up.

For every single supply relationship between PO and processing company there is need to prepare three original copies of the single supply contracts: one remains with the PO, one with the processor and a third one will be deposited with the IBO North Italy Processing Tomato. The IBO North Italy Processing Tomato will check the adequacy of the supply contracts. POs commit to reach a medium yield per PO not less that 75 t/ha. Higher yields have to be communicated and approved first by the IO.

The parties commit to agree beforehand on quantities and procedures of supply of the raw material (tomatoes), i.e. frequency and timing of supply. Processors commit to allocate daily supply quantities and detailed distribution of supply during the day to each PO. POs have to provide the processing companies (within April 15 2018) with a list containing the names of the growers that supply the raw material with respective information on acreage and quantities per single grower.

Tomatoes delivered to the processing industry have to undergo a quality check within four hours of the agreed delivery time.

Sanctions and compensations

The delivery contracts foresee certain sanctions and settlements. The most important ones concern the following aspects:

- Payment time limits
- Obligation to supply the contracted quantities of the raw material
- Obligation to accept the contracted quantities of the raw material

8.3.3 PRICE NEGOTIATIONS

Price negotiations between production and processing industry

In North Italy, the negotiation between POs and processing industry leads to the definition of a reference price for the tomato raw material. The reference price is a price set based on the historical prices paid in the past, through the analysis of past contracts. The IBO North Italy Processing Tomato overlooks the relation among IBO actors. The reference price set is not a minimum price. This price can vary according to qualitative parameters specified in the Framework Contract agreed by all the companies of the district. One of the parameters that can affect the final price actually paid is the level of “BRIX” of the tomato. Another parameter is the “percentage of major and minor defects”. The North Italy IBO North Italy Processing Tomato is not involved in the price negotiations between Producers and Processors. The IBO North Italy Processing Tomato is committed to verify that each contract complies with the general Framework Contract agreed.

In 2018, the framework contract was confirmed and signed by all parties on February 9 and was valid until December 31 2018. The agents of the Northern production district agreed on an approximate price for the 2018 campaign of 79.75 €/t (same as of 2017). Aim of the IBO stakeholders is to conclude price finding within January/February of

each season. For the harvesting season 2019 members of the IBO have agreed on a reference price of 86 Euro/tonne on the 3rd May 2019. The final price values 8% more than the previous year. Members of the IBO agreed on an increase of the producer price for tomatoes (farm level) compared to the previous season. The negotiation was long and debated within the IBO. This is mostly due to stocks of processed tomato at processing industry level from the previous seasons (-5% in processing industry sales in 2018). This has created difficulties for the processors in paying a higher product price to growers. This may not lead to higher prices for the product further down the value chain at retailer level.

Generally, trade relationships between processing industry and POs are quite stable over time. Singular supply contracts between POs and processing industry are established after the reference price has been set, normally around April.

Example for production and payments in IBO North Italy Processing Tomato, season 2018

In 2018, more than 2.8 million tons had been contracted, of which 86.82% tons have actually been delivered to processing companies as shown in Table 8-7. The quality of tomatoes delivered to processing companies gave rise to a relatively high percentage of penalty deductions in the IBO North Italy Processing Tomato (more than 13%), resulting in around 2.4 million tons being paid to growers (86.82%). The low quality of raw material was due to adverse weather conditions, hailstorms that damaged crops, the high proportion of early ripening, and to infestations of red spiders in the province of Parma.

Table 8-7 Contracted Quantities and Net Delivered and Net Paid Quantities in the IBO NORTH ITALY PROCESSING TOMATO, season 2018.

Contracted Quantity (t)	Net Delivered (t)	Deduction (t)	Net Paid (t)	Percent Delivered/ Contracted
2 818 721	2 573 879	126 947	2 446 932	86.82%

Source: Tomato News 23 November 2018 (data received from IBO North Italy Processing Tomato 2018)

Timing of production planning and price negotiation

Price negotiation and production planning among producers and processors is from October to February. Final signature of contracts occurs generally in February.

The tomato harvesting is carried out from July to September.

Agreements with other upstream and downstream companies of the tomato chain:

- Packaging (by April/May)
- Negotiations with the distributors (retail, food industry, food service) are carried out at the beginning of the season. Processing industry and distribution negotiate around 70% of the supply/purchase contracts at the start of the campaign to guarantee volumes and quality.

Vulnerability of the governance system

Experience of past years shows that the IBO North Italy Processing Tomato agreements can be vulnerable. During the 2016 campaign, the two crucial elements of the framework contract failed: the actors of the chain did not respect the time limit for setting up the supply contracts and the time limit for payments. Producers were in a weaker negotiating position due to unsold surplus of previous years. Processing firms required reducing tomato cultivation in order to avoid overproduction and with the aim to keep the price level high. Producers and processors could not reach a timely agreement and in consequence signed contracts only in June, when the tomatoes were almost ready for harvesting. Since tomato production exceeded tomatoes under contract, a penalty of 2.25 Euro per ton was applied to every producer on the reference price agreed (Mantino & Forcina, 2018).

Results from the interviews with processed tomato stakeholders confirm that the situation within the IBO may be instable. Some members might want to exit the IBO. The reason for leaving the organization is that they may prefer not to work with a reference price. This year one important member left the IBO. Each year members have difficulties to agree on a price. Another interviewee comments that the IBO reference price was unsatisfactory over the last seasons.

Moreover, during the 2019 long negotiation for the reference price, the North-East area of tomato production has maintained in force the contract signed at the end of 2018, whereas the North-West area has signed the agreement on Friday, May 3. Thus, "unfortunately the Emilia Romagna farmers' association says - today there are two contracts with different prices and above all quality tables between them. The 2019 reference price is ensured with base 100 at 4.95 brix. This does not take into account the average values, that is a 4.78 brix weighted average figure recorded by IBO in 2018, already higher than that of the previous year".

In synthesis, according to some interviewees, the IBO allows for necessary market concentration and social collaboration between the actors of the value chain that improves the competitiveness of the IBO. Other interviewees, such as the representative association of agricultural producers, sustain that the IBO is not adequately influential. They say that the IBO has no real influence on members, because it lacks decision-making power. As consequence, this situation generates delays for the yearly price agreements.

Producers commitment to limit tomato production in season 2019

The tomato farmers through their representative organization aimed at limiting the problematic situation for the programming of the season 2019. Tomato farmers within the IBO analysed the supply and demand curves for processed tomatoes and signed a contract where they commit to limit the number of hectares for tomato production in 2019 in order to balance the situation. They will limit the number of hectares to the equivalent of 35.800 ha and to not exceed the quantity of 25.800.000 quintal of processed tomato. If the numbers were to be exceeded, producers would have to pay a penalty, 500€ / ha and 10 € /tonne. This means a penalty on production and one on yield.

Furthermore, to improve the overall governance situation of the processed tomato sector, the tomato farmers' representative association aims to create a real "Tomato district" with regulatory instruments governed by the regional authorities. This would

allow to generate a value chain characterized by collaboration between a number of actors active in the sector. According to the association, this would result in stronger commitment and playing by the rules for all actors. Establishing a district would mean that there is a body that monitors, controls and certifies that all actors respect the norms and regulations along the value chain. A further positive output could be the creation of a regional brand for the processed tomato of the northern production region that represents sustainable, ethical and social values.

Characterization of relationships between producers and processing industry

Some relationships between producers and processing industry exist since a long time, are oriented to be long-term, and are based on collaboration and trust. To realize innovation and improvements in the value chain a good level of collaboration is necessary.

To improve competitiveness processing companies, invest in increasing sustainability standards, so to be able to propose products with a sustainability attribute. This requires investments in the processing plants, and cooperation with producers. The tomato processors promote projects in cooperation with selected tomato growers to reduce the use of chemicals in the tomato production. According to the interviewees, the processing industry is aware that they need to compensate this economically, because the farmer has to make more investments and has a higher production risk.

Price negotiations between processing industry and retailers

Price is a key driver in the tomato processed chain. Nevertheless, retailers have different management negotiations. Particularly foreign retail chains and discounters are highly price driven. Some national Italian retail chains give more importance to production quality. Some discount retailers may use the practice of online auctions. The processors negotiate only a small part of their products (15%) with the retailers through electronic auctions. However, the pricing set in the auctions influences the whole tomato industry and market. Interviewees (processing industries, representative association of producers) sustain that the auction system influences the price setting strategy also beyond the auction system itself. The auction system may lead to low prices, even below production costs.

For processing tomatoes, auctions are held once or twice a year. They are never made through face-to-face meetings but online. Auctions, according to one of the interviewees, seem to be a long-standing business practice, originating in Germany and England. In addition, some of the organizers of the auctions require a document signed by the participants stating that they do not intend to apply offers with below-cost prices.

The auctions proceed in two phases as follows:

- First round: In a first round of the online-auction, retailers request via email a first price offer from tomato processors. Processors then have around 20 days time to make their offer.
- Second round: Afterwards, the retailer starts the second auction-round, which is based on the lowest price offer from the first round. The second round concludes within just a few hours and it is blind. The tomato processor offering the lowest price will win the second round of the auction.

Tomato News (4 December 2018) cites the General Director of ANICAV (National Association of Industrial Vegetable Food Preserves) on this topic: "[…] online auctions […] these practices represent a highly critical aspect of the industry as a whole and, in particular, for processing companies that are required to support all of the negative effects of the pressure on prices. […] that the price paid to growers by Italian processing companies, particularly in the South Central region, is one of the highest in the world, because it is paid in appreciation for a level of quality of the raw materials that is higher than that of other producing countries."

Tomato processors point out the need for stronger collaboration within the tomato industry and large-scale distribution. More ethical relationships in the distribution and sales of processed tomato products are necessary to keep the processed tomato value chain competitive (ANICAV 2018, 30.11.2018; Ciconte & Liberti, 2016).

An agreement between the retailers and the processors could prevent auctions from being used. However, from the retailer's point of view, the biggest contribution to preventing these practices should come from the processors. In fact, according to interviews with retailer, auctions are an incorrect mechanism that retailers find it hard to escape from, especially if adopted by competing retailers.

Low-cost and discount retailers' impact on the price setting mechanism of all retailers. Together with auctions, retailers sustain that the low price of processed tomato of discount retailers contribute to lowering the price of the product sold by all retailers. All retailers are pushed to lower prices to maintain competitiveness. Obviously, this system has a negative effect on all players in the supply chain, and in particular on the producers.

There are strategies that the processing industry adopts to cope with difficult market situation and retailers. To compensate for difficult and complex relationships with some retail actors in the value chain, tomato processing industries try to access new markets and new clients. Currently, Italian tomato processing industries try to work more on export markets. Another strategy is to invest more in alternative sale channels, i.e. food industry and food service, which are important sales channels within the IBO North Italy. Generally, if the processed tomato is an ingredient product, e.g. in case of sales to the food industry, the quality requirements are lower.

The role of private standards set by buyers

Some processing industries sustain that some clients require specific contractual agreements, certifications or product characteristics. These requirements on the one hand could result in increased production costs for the processor. On the other hand, these additional stricter requirements allow to create more exclusive, trustful and long-term relationship with the buyers. The tomato processing industry focuses on product quality and specialized products to access new clients and niche markets.

8.3.4 ETHICAL AND ENVIRONMENTAL ISSUES

Labour safety

Safety of workers, especially in the agricultural stage of the chain, is a central theme. Besides ethical issues, accidents can also damage the reputation of the whole district/sector with consequent contraction of the demand. Accordingly, retailers,

especially if selling processed tomato with their own private label, include the authorization to control the safety conditions of the agricultural workers in the contract with the processors. In other words, in this case the processor is free to choose its own suppliers, but the retailer can check the quality of the products and the safety conditions of the agricultural workers.

First level of control is based on formal aspects (e.g.: matching of number of contracts with number of workers to identify undeclared workers). Further controls are carried out with private interviews with workers and field audits. The workers' confidential statements are useful. One important retailer, connected both with Northern and Southern Italy tomato districts, highlighted that this sector has the highest levels of control and stated that 100% of the producers are checked in the South district in a 3-year period. Minimum wages of agricultural workers are defined by provincial contracts (with minimum differences between regions) but longer working time are not easily controlled with follow-ups. Several standards can be adopted as concerns safety and social responsibility, such as SA8000 certificates.

Waste recycle

Besides labour safety, environmental issues represent the other top priority of this sector as concerns corporate social responsibility. Several interviewees stated that all the waste of the tomato is recovered and recycled during the processing stage and utilized in the production of fodder and biogas. An interviewee of the processing industry stated that also the tomato that is not processed - because it does not reach the level of quality requested – is entirely recycled.

8.3.5 RELATIONSHIP WITH OTHER VALUE CHAINS

Relationships with the seed industry

Most of the seeds used in the North Italy supply chain come from multinational seed companies. Local companies cover about 5% of the total supply of seeds. So there is a limited choice of the type of seeds that can be chosen. In some cases, the producer organizations buy the seeds collectively for their members in order to get better prices through a concentration of the offer. The seeds are often given to suppliers who grow the seeds into young plants. Then young plants are given to the tomato producers for planting in the fields.

Relationships with regional packaging and mechanical engineering

The local packaging industry for canned tomatoes has an important role in the North Italy supply chain of the processing tomato. However, its role became less relevant in the last years. Currently many suppliers are at national and international level. This change is also due to the fact that now retailers decide the type of packaging, defining rules according to size, materials, etc. and thereby forcing the selection of the packaging suppliers.

Relationships with the local mechanical engineering cluster

The role of the local mechanical engineer cluster is still fundamental, with the local presence of leading companies in the machinery industry for tomato harvest. In Parma there are companies' leaders at global level specialized in the design, realization and installation of complete production lines for tomato processing.

Relationships with the logistics sector

The logistics sector has close relationships with the tomato district, especially in the harvesting period, when the processing plants are working 24h/d and the effectiveness of the supply is very important. Logistics is mostly outsourced. For the access to the international market there are some operators specialized in the processed tomato.

Processors can have consolidated relationships with the logistics operators. Some of these companies increased their activity together with the company itself. Anyway, other logistics operators are not so consolidated. Logistics operators can also provide warehouses for storage services. Some processors provide storage for products already sold to the retailers. Retailers can manage logistics in-house or outsourcing to external operators.

Role of standards and certifications

According to interviewed processing industries, standards and certifications should be accompanied by the strict monitoring of the origin of the tomato raw material. They mentioned that on the product packaging only the production site of the processed product is indicated, but not the production site of the raw material. Production costs for Italian tomato for processing are high and the product is of high quality. Italian costs of production and of raw material cannot easily compete with the costs of goods coming from other production countries, e.g. China. Production costs in Spain and Italy are similar. Concentrate tomato is often from China.

Processed Tomato label: origin of the raw material

On 27 August 2018, an Italian National decree formally entered into force, requiring the origin of the raw material for tomato processed products to be indicated on the label. This applies to peeled tomatoes, pulps, concentrates, preserves, as well as sauces and sauces consisting of at least 50% of derivatives. The decree number 47 published in the Official Gazette on February 26, 2018, was defined as "experimental" and valid until December 31, 2020. However, the applicability of such regulation is controversial, as many support it, this violates the European law. In particular, there was no prior notification to the European Commission.

Thus, some support that the indication on the label of the origin of the tomatoes used in the preserves remains optional. However, many processed tomato companies voluntarily indicate on the label the origin of the tomato on the processed tomato products made in Italy. There are two reasons for this: to enhance our product, which is considered one of the best in Europe, and to oppose the widespread opinion about the use of Chinese tomato concentrate in our preserves.

Objective of this measure is to guarantee that the consumer receives correct and complete information about the products origin, to improve the traceability of agrifood products, to make food labelling clear and transparent, and to ensure a more efficient protection of consumer health.

The Information to be indicated for tomato based transformed products are:

- Country of origin of the cultivation of tomatoes
- Country of processing of the tomatoes: EU countries, non EU countries
- If all cultivation and production activities are carried out in Italy: “Origin of tomatoes: Italy”

8.4. VALUE CHAIN GOVERNANCE IN THE PROCESSED TOMATO VALUE CHAIN

8.4.1. INTRODUCTION TO THE THEORY ON THE GOVERNANCE OF GLOBAL VALUE CHAINS

"The governance of global value chains" (2005, Gereffi et al.) offers a framework for analysis of power asymmetries related to different types of governance. The study identifies 3 key variables and 5 types of GVC governance. "The governance types comprise a spectrum running from low levels of explicit coordination and power asymmetry between buyers and suppliers" (Figure 8-9). Furthermore, there can be other important elements to consider, such as: local/national institutions and spatial and social propinquity.

"Explicit coordination" is higher when complexity of transactions is high (with consequent higher "transaction costs" needed to coordinate the value chain) and the suppliers have low ability to codify transaction and low capabilities in relation to the requirements of the transaction. This contributes to the understanding of the model governance of a value chain.

In the Gereffi model of governance, a higher degree of explicit coordination corresponds to a higher power asymmetry, while in the IBO North Italy higher level of coordination is present with the objective to reduce power asymmetry. This apparent contradiction can be explained considering that the Gereffi framework refers to "coordination" from the point of view of the lead firm, while in the North Italy IBO the power inside the organization (in terms of number of vows) is distributed between producers and processors.

Governance type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	Low
Modular	High	High	High	↑
Relational	High	Low	High	↓
Captive	High	High	Low	
Hierarchy	High	Low	Low	High

Figure 8-9 The key determinants of GVC governance (source: 2005, Gereffi et al.).

There are three main factors on which the theory of value chain governance is based:

A. Complexity of transactions: "The *complexity* of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications". In "Markets" governance "Because the complexity of information exchanged is relatively low, transactions can be governed with little explicit coordination". Also according to Gereffi, coordination and

transaction costs can rise with products whose output is time sensitive and is reduced when technical and process standards are present.

B. Ability to codify transactions: "the extent to which this information and knowledge can be *codified* and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction". In "Modular value chains (…) because of codification, complex information can be exchanged with little explicit coordination, and so, like simple market exchange, the cost of switching to new partners remains low".
C. Capabilities in the supply base: the *capabilities* of actual and potential suppliers in relation to the requirements of the transaction."

(2005, Gereffi et al.)

The same article also identifies three categories of supply relationship:

- "Commodity": providing standard products through arm's length market relationships;
- "Captive": non-standard products using machinery dedicated to the buyer's needs;
- "Turn-key": producing customized products for buyers and uses flexible machinery to pool capacity for different customers

Another aspect to consider refers to the "dynamic and overlapping nature of global value chains. Value chain governance patterns are not static or strictly associated with particular industries". So, each company at any step of the chain manages and adapts to transactions within a number of chains. These chains can extend to various products categories.

The interviews carried out used the Gereffi model theoretical framework as suggested by Task 5.1 leader partner. If a certain governance model can be identified, not all the "key determinants" match with that of the abstract model.

8.4.2. GOVERNANCE IN THE PROCESSED TOMATO VALUE CHAIN

Two main levels of relationship governance were identified for the processed tomato value chain. Level 1 refers to the governance of relationships between tomato producers and processors. Level 2 refers to the governance of the relationships between processors and distribution (Figure 10).

Level 1 – Governance of relationships between tomato producers and processors

In North Italy, many producers and processors are part of the regional Inter-branch Organization (IBO). Relationships between producers and processors are characterized by a particular situation in the IBO North Italy, with e.g. long-standing relationships, tradition, local concentration, sharing of information, collaboration in the IBO, etc. Level 1 (regional/local relations) should be analysed separately from the following stages of the value chain.

The analysis of GVC governance conducted for Level 1 (relations within the IBO North Italy) suggests a mostly Relational Value Chain Governance Model, because the dependence between producers and processors is mutual. The dependence of tomato producers with processors is high, and also processors are fairly dependent on

processors. Moreover, spatial proximity is a key aspect both in the North and South Italy districts.

The definition of the relational value chains is the following:

> "*Relational value chains.* In these networks we see complex interactions between buyers and sellers, which often create mutual dependence and high levels of asset specificity. (…) Many authors have highlighted the role of spatial proximity in supporting relational value chain linkages, but trust and reputation might well function in spatially dispersed networks where relationships are built-up over time (…)." (*The governance of global value chains*, Gereffi et al., 2005).

Furthermore, there are key determinants of the value chain that can be pointed out.

First, most of the processed tomato provided by the farmers to the processors within the North Italy IBO is considered a commodity. Despite this, the coordination of the transactions of the goods is complex. This is due to a number of reasons, such as the high total volume of production that has to be controlled and monitored, and the specific and short time period, from June to September, during which the fresh raw tomato product has to be produced and delivered. There are other factors that create complexity such as possible climatic variations for each harvest, quality standards required by processors versus the quality provided by the local production, and the management and monitoring of social sustainability of seasonal labour force.

Second, within the IBO North Italy there is a good ability to codify the quality standards of the products. The framework contract of the IBO includes specific parameters - such as Brix and presence of defects - to define price variations according to the quality of the tomatoes to be processed. This pre-defined codification of some aspects of the production diminishes the complexity of the transactions.

Third, the volume of productions is strictly related to the reference price. The volumes of tomato tend to affect the reference price with a delay of one year. Indeed, one of the main issues in the coordination with the processors is to avoid overproduction of tomato that - according to some interviewees - could cause economic collapse of the district (see Figure 8-10).

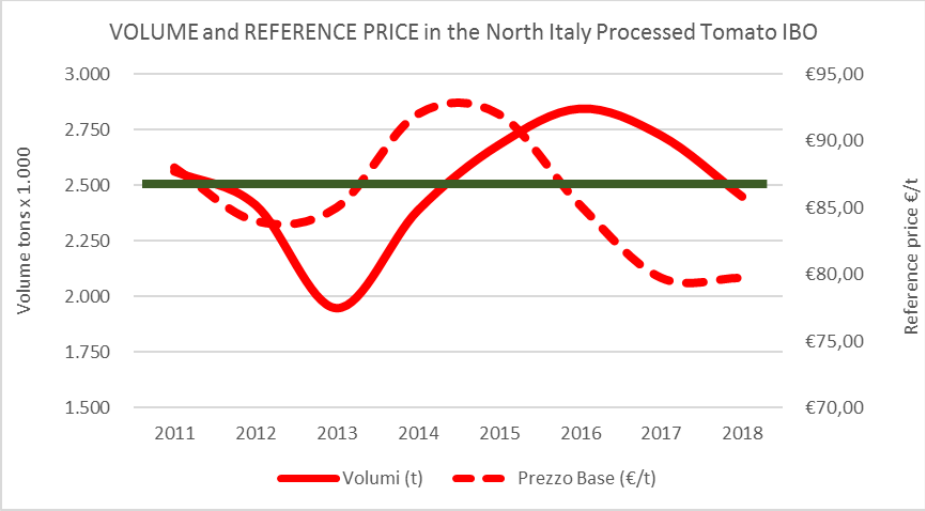

Figure 8-10 Relation between Volume and Reference price in the IBO.

Finally, quality variations of the tomatoes due to environmental factors can vary each year. Some companies have fixed standards of top quality that can be challenging to achieve in the difficult seasons. In the North Italy IBO, most of the producers relate with the processors through “producers’ organizations”, that can be classified as “relational” suppliers.

Level 2 - Governance of relationships between tomato processors and distribution

Level 2 refers to the governance of the relationships between processors and distribution, i.e. retailers (Level 2A), food industry (Level 2B), and food service (Level 2C), which are external of the IBO (global relations).

Level 2A - relationships between Processor and Retailer in the processed tomato value chain

The Modular value chain model was identified as predominant (Level 2Aa). When focusing on the processor-retailer relation for private label products, the governance become closer to the Captive model (Level 2Ab). Retailers are the lead firm, and tomato processors are suppliers.

> “*Modular value chains.* Typically, suppliers in modular value chains make products to a customer’s specifications, which may be more or less detailed. However, when providing ‘turn-key services’ suppliers take full responsibility for competencies surrounding process technology, use generic machinery that limits transaction-specific investments, and make capital outlays for components and materials on behalf of customers”.
>
> (…) “*Captive value chains*. In these networks, small suppliers are transactionally dependent on much larger buyers. Suppliers face significant switching costs and are, therefore, ‘captive’. Such networks are frequently characterized by a high degree of monitoring and control by lead firms” (The governance of global value chains, Gereffi et al., 2005).

Also for Level 2 there are key determinants of the value chain that can be pointed out.

First, processing tomato requires a production line with a high level of specialization, specific for processed tomato. Thus, there are high asset specificities. There is need of high investment costs focused on tomato processing and a complex network of suppliers and customers. The relationships among the economic actors of the chain are often based upon long-standing relationships, thanks to ensured quality standards and reliability. In particular, processors that invested on quality and/or branding declared to have good collaboration with retailers.

Retailers buy their goods from a number of providers, based in different Italian geographical areas and abroad. Retailers tend to establish long-lasting relationships with their providers. This allows to compensate for possible unforeseeable difficulties during the provision and the selling. Furthermore, retailers may have a role in containing higher raw or processed material prices. Higher prices are not always transmitted on the consumer price. Changes in the raw material prices may be part of the provision negotiation discussed between the processing industry and the retail sector.

Second, the types of products to be provided to the retailers are generally highly codified. The processed tomato bought by retailers is of different typologies (pulp, chopped, concentrated, cherry tomatoes, local products, private versus commercial brand, organic, etc.). Interviewees support that consumers still perceive the processed tomato as a commodity. However, there are increasing investments to modify the current undifferentiated market positioning of the processed tomato. Retailers are

increasing the number of processed tomato Stock Keeping Units (SKUs) to increase the level of differentiation of the processed tomato category.

The standards set by the retailers represent a cost for the providers. However, as confirmed by retailers and by some processors, these costly higher standards may also lead to a competitive advantage for the providers, providers' higher efficiency leading to lower production costs, and higher quality products. Thus, the retailers tend to establish longer commercial relationships.

Third, there is a "risk of overproduction" that impacts on the relationship between producers and processors within the North Italy district, as explained above. Research findings support that the quantity of the supply does not impact the Level 2 relationships. The processors have a high capability to respond to the retailers' requirements in terms of quantity. As concerns quality, retailers sell processed tomatoes with different levels of quality and price. The quality provided by the Italian processors can reach high levels of quality.

How the capabilities of the suppliers influence the governance of the chain can be explored by focusing on the way the price is negotiated. In some contracts, the price negotiation between processors and in particular discount retailers is carried out through online auctions, as discussed earlier. The price set through the auctions may influence also other suppliers' capabilities to negotiate the price and the supply of goods.

Specificities of the relationship between retailers and private label products providers.

A distinction has to be made in how relationships are governed between retailers and suppliers of private labels. For the suppliers of private labels, according to the interviews, the model of governance may turn into a "captive value chain", with also some positive impact. Retailers have higher quality and operational management requirements expected from the providers compared to commercial brands providers. The providers may be forced to comply to a number of requirements, that in turn may lead to higher efficiency in the production processes, higher standards of productions, a higher number of certified processes and products, and possibly higher environmental, social and economic sustainability.

Retailers, especially for private label products, aim at having continuity in the relationship to ensure good products quality and supply. Suppliers may be substituted if the relationship is deteriorated, due to management inefficiencies or poor quality in the product. With providers of commercial brands of processed tomato products, the relationship is often based on elements that differ from those providing private label products. In particular, if the processor has a well-known commercial brand and sells high volume of products under that brand the negotiation between the processor and the retailer is more balanced. Thus, if the relationship is with a big tomato process industry processor the relationship tends to be "modular".

Retailers may adopt higher standards in the quality of the production, safety of the workers and environmental sustainability for private label products. Farmers that do not comply with the retailers' standards, as agreed with the processors, can be excluded from the retailer's value chain. The reputation of the retailer is strictly connected to the quality and ethical standard of its products. Processed tomato consumers are sensitive to the issue of economic, environmental and social sustainability of the value chain.

Retailers may apply procedures for ensuring certifications of private label products. These go from purely controls of supplier economic-financial sustainability to auditing procedures. There are checklists and retailers provide an “action plan” to support providers in complying to the set standards. Retailers tend to rely on external structures that provide a support on how to carry out the action plan, such as certification, procedures, hygiene standards, product traceability, sound management of raw materials, etc. There is an accurate control plan that in the first phase certifies the suitability of the supplier to the retailers’ standards. Some retailers interviewed stressed the relevance of environmental sustainability, with commitment on waste management, or reduction of portions.

Further elements that shape the governance of the processed tomato chain

The relationship between retailers and providers is influenced by the competitive environment retailers experience. Retailer pricing and provision relationship is influenced in particular by low-cost and discount retailers. In recent years, discount stores have grown significantly. They have been able to evolve and overcome the common perception of the discount store. They have a format more similar to the normal supermarket: the size of point of sales tends to be small, slightly larger than the small store around the corner, located in central areas, with a limited number of references. In many cases they have also been able to improve the assortment, focusing on organic and local products. The discount is still managed as a discount, aiming at low management costs, but the quality of the products sold is rather high. Consumers strongly appreciate these new formats.

The consumers’ drivers of processed tomato purchasing can impact the chain functioning. Consumers tend to prefer the product with the lowest price over the product with a higher price. This together with lower prices set by low-cost retailers stimulate dynamics of "price wars" between retailers. This causes a damage to the entire supply chain. The processed tomato, if remains a commodity, can be negatively affected by these dynamics.

It is important to point out that processed tomato sales have been declining for years. This is widely due to a change in consumers purchasing and consumption behaviour of processed tomato. In this framework the promotional pressure is the first pricing strategy adopted by the retailer. In the last year around 40% of processed tomato was sold with a promoted price. This price dynamic decreases all processed tomato chain agents’ margins. In order to overcome this price dynamic, some tomato processors have aimed at increasing the brand value and brand equity. When the consumer acknowledges the brand value the processed tomato is more differentiated, and the consumer may be willing to pay a price premium.

Level 2B - relationships between Processors and Food Industry

The governance of the chain between tomato processors and the food industry companies is based on transactions similar to the retailers/distribution model of governance (Level 2A). Moreover, the ability to codify the economic and provision transactions is fairly high. The types of products provided to the food industry is more standardized compared to the one provided to retailers, in particular in terms of packaging and range of products.

Long-time relationships are often present between processors and industry. The food industry is seen as a good opportunity to expand the commercial markets for the processors. This is especially so for processors that have not significantly invested on their own brands. Some processors offer also storage and logistics services to the food industries. The relationship between the processors and the food industry is rather balanced. However, it may suffer due to the high international competition. Overall, this type of food chain governance is mainly of "market" type.

Level 2C - relationships between Processors and Food services

The relationships between Processors and Food services is similar to the governance model of 2B. The overall complexity of the transaction develops similar dynamics. The types of the products provided for food services is generally less standardized and, in some cases, it may require high standards. Actually, one of the challenges of the tomato producers is to adequately present the quality of the products offered to the processors, so to overcome the commodity positioning and limit international or low-quality competitors. Finally, it is to be pointed out that this type of processed tomato chain still represents a low market share for the national tomato processors. Research findings support no particular coordination issues. Overall, this type of food chain governance is mainly of "market" type.

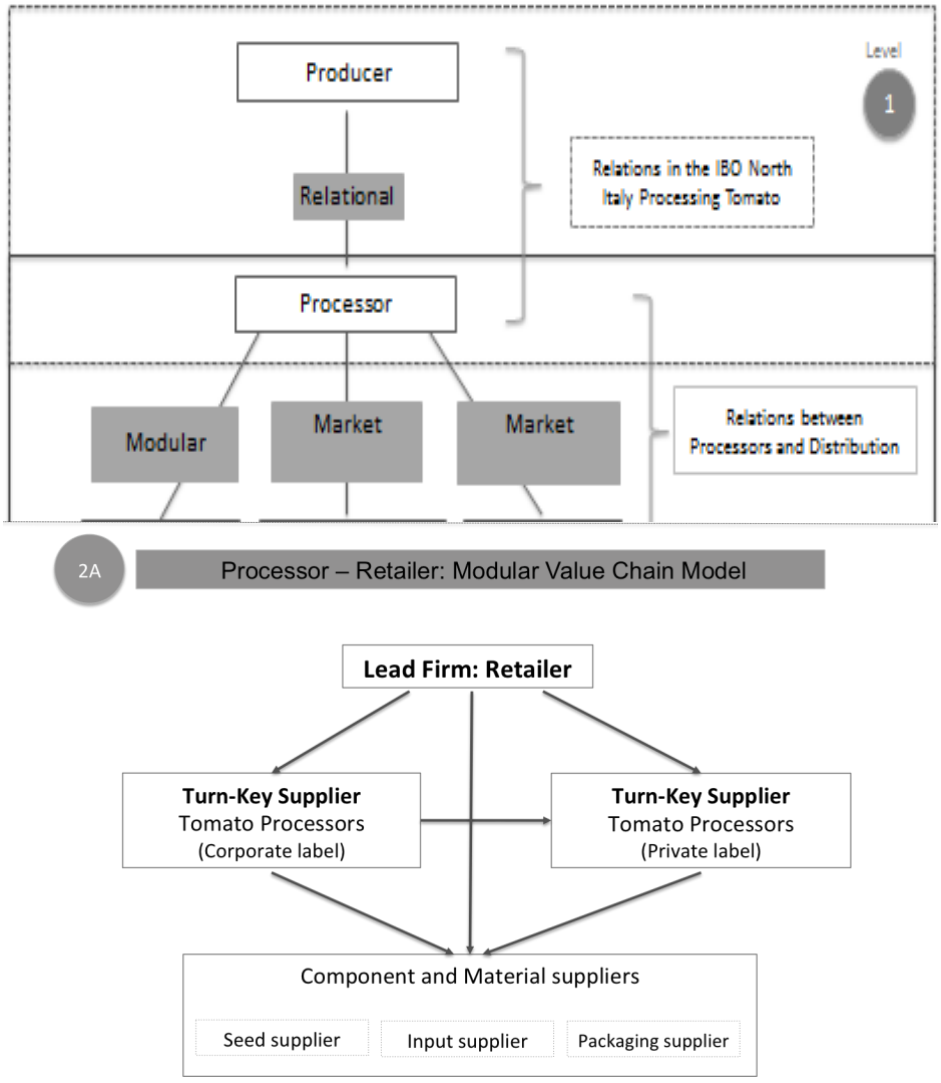

Figure 8-11 Processed tomato CS governance structure and types identified.

Actors involved in the processed tomato value chain as emerged from the interviews:

a. **Landowners**, who provide irrigated land suitable for the production of vegetables at the highest rental price;

b. **Machine suppliers** (generic and specific for tomatoes), make technological innovation available to improve the efficiency of production costs.

c. **Suppliers of systems and materials for irrigation** (tube pumps and hoses), provide technological innovation and contribute to increasing efficiency per unit area thanks to increased yields;

d. **Suppliers of technical means for agriculture** (seeds, seedlings, fertilizers, crop protection products), provide technological innovation and often deal with technical assistance and therefore influence the cultivation techniques. They can play a significant role in financing cultivation costs;

e. **Service providers** (e.g.: account third parties and providers of "pure" technical assistance), the former can aggregate small producers who have no or partial mechanization. The figure of consultant is not very widespread in the North while it is widespread in the South;

f. **Agricultural producer**, integrates the factors of production, including labor and research into the economic optimization of cultivation through an increase in cultivated areas (economies of scale), trying to increase yields per unit area. Cost control is not always a priority because many cost items have the function of ensuring production conditions. The agricultural producer can hardly influence the price of the product;

g. **Producer organizations**, aggregates and tries to regulate supply according to demand even if it does not hold the product. It is an active part in logistics and in the management of certification schemes (e.g.: integrated production UNI 11233, ISO 22005 traceability, Global Gap GRASP, SA 8000, etc.);

h. **Material suppliers** (packaging and related materials);

i. **Logistics suppliers** for transporting fresh tomatoes, packaging, semi-finished products and finished products;

j. **Storage** (storage spaces for the entire seasonal production);

k. **Processing industry**, integrates the previous actors and provides for the first and / or second transformation, as well as the storage and direct or B2B marketing of semi-finished and / or finished products;

l. **Distribution network**, is represented by the network that brings to the consumer (retail / HORECA) the finished product both of brand and distributor brand;

m. **Final consumer**

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ANNEX 8

ANNEX 1: MEMBERS OF THE IBO NORTH ITALY PROCESSING TOMATO

PRODUCER ORGANIZATION	PROCESSING COMPANIES AND COOPERATIVES	PROFESSIONAL ASSOCIATIONS
AFE	ANICAV	CAMERA DI COMMERCIO DI PARMA
AINPO	CARLO MANZELLA & C	CAMERA DI COMMERCIO DI CREMONA
APO CONERPO	COLUMBUS	AZ. AGRARIA SPERIM. STUARD
APOFRUIT	CONFAPINDUSTRIA PIACENZA	CADIR LAB
APOL	CONSERVE ITALIA	CRPV
ASIPO	EMILIANA CONSERVE	SSICA
ASPORT	FRUTTAGEL	
CIA REGIONE EMILIA ROMAGNA	GRECI INDUSTRIA ALIMENTARE	
CICO	GRUPPO FINI	
CIO	ITALFRUTTA	
CONFAGRICOLTURA RER	LA CESENATE	
CONSORZIO CASALASCO DEL POMODORO	LE DUE VALLI	
MINGUZZI	MENU	
OPOE	MUTTI	
OP FERRARA	POMODORO 43044	
PEMPACORER	RODOLFI MANSUETO	
POA	SOLANA	
VERDE INTESA	STERILTOM	
	TERRE DI SANGIORGIO	
	TOMATO FARM	
	UPI - UNIONE PARMENSE INDUSTRIALI	
	ZIPPERLE	

Source: IBO North Italy Processing Tomato, 2018

ANNEX 2: KEY EU POLICIES AND REGULATIONS: ITALY AND EMILIA-ROMAGNA REGULATIONS

The role of public policies and regulation

Tomato producers and processor have access to different policy instruments/financial resources to support organization and technical innovation and to switch to more sustainable production and processing methods (Mantino & Forcina, 2018).

- Payments made to beneficiatreis of CMO and RDP (POs, cooperatives)
- Majority comes from CMO resources (97%) (Mantino & Forcina, 2018)
- Resources from the regional law for promotion of development services to the agrifood system (Law 28/1998) financing research projects important for sustainability

The agricultural policy of Emilia-Romagna played an important role in supporting the adoption and promotion of integrated production by compensating reduction in yield and increase in production costs (Mantino & Forcina, 2018).

Table 8-8 Overview of Key EU Policies and Regulations

Common Agricultural Policy

Producer Organizations and Interbranch Organizations (Regulation EU No 1308/2013 Articles 152-158) on the recognition of producer organizations, associations of producer organizations and interbranch organizations.

- Producer Organizations (whether or not organized as cooperatives) are important players in the food supply chain. They contribute to strengthening the position of producers versus other downstream actors in the food supply chain by carrying out a wide array of activities (e.g. concentrating supply, improving marketing, providing assistance to their members, etc.).
- Interbranch Organizations are vertically integrated organizations, which comprise producers and at least one member of the processing or trading part of the supply chain. Interbranch organizations provide a means of allowing dialogue between actors in the supply chain, and in promoting best practices and market transparency. Definition Interbranch Organization (IBO): An interbranch organisation is a self-organised, vertically integrated entity created by different players and branches of the agro-food chain, including always representatives linked to production and at least one partner from another part of the supply chain, e.g. manufacturers, processors, trade and retailers, Article 157 CMO Regulation. Interbranch organisations (IBO) carry out many activities for their members and provide a means of allowing dialogue between actors in the supply chain, and in promoting best practices and market transparency.

National Legislation Italy

- Law n. 91 of 2 July 2015 converting in law Decree Law 51 of 5 May 2015 laying down urgent provisions for the strengthening of agro-food sectors in crisis, in support of agro-food business operators affected by circumstance of exceptional nature and reorganisation of the ministerial departments , in Official Gazette n 152 of 3 July 2015, p. 13 http://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/origina

rio?atto.dataPubblicazioneGazzetta=2015-07-03&atto.codiceRedazionale=15G00113&elenco30giorni=false • Law n. 91 of 2 July 2015 (*consolidated text)* http://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2015-07-03&atto.codiceRedazionale=15A05214&elenco30giorni=false Communication made under Article 19(7) of Regulation (EC) No 2200/96, (2006/C 67/09), Interbranch organisation in the fresh fruit and vegetables sector, Legal basis of recognition of Ortofrutta, in EU Official Journal 18 March 2006, p. 28. http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52006XC0318(06)&from=IT
EU Agricultural Fund for Rural Development (1305/2013)
Competition and Fairness • Supply chain agreements and framework contracts for agro-food chains (Art. 9 and Art. 10. of Italian Law Decree 102/2005). The Supply Chain Agreements ("Intese di filiera") and Framework Contracts ("Contratti quadro") for agro-food chains involve the representative organizations at national level in the sectors of the production, transformation, commerce and distribution of the agro-food products. The regulation also admits agreements involving the Inter-professional Organizations recognized in accordance with the article 12 of the national Law Decree 173/98.
Fraud, Transparency, Food Information • Obligation to indicate production factories on the label of packaged agro-food products (*Law Decreee 15/09/2017 no 145, G.U. 07/10/201*)
Social and Environmental • *Regional Act no. 29/1998* financing research, experimentation, and technical support • *Regional Act no. 28/1999* introducing the promotion of agricultural and food products obtained with methods and practices respectful of environment and human health and establishing the regional eco-label Controlled Quality (Qualità Controllata - QC). This foresees mandatory control operations. The QC is a brand registered by the Emilia-Romagna Region.
Food Safety and Hygiene • Measure for the extraordinary promotion of Made in Italy and attraction of investments (Law Decree of March 14 2015 from the Minister of agriculture, food and forestry policies and the Italian Trade Agency (ITA); in accordance with art. 30 of D.L. 133/2014 with modifications of L. 164/2014)

ANNEX 3: STAKEHOLDERS INTERVIEW LIST

Table 8-9 Stakeholder interview list

INTERVIEW	*DATE*
IBO of North Italia Tomato – General Secretary	*22 08 18*
Tomato Farming Manager	*20 07 18*
Farmer Association Manager	*27 03 19*
Tomato Processor Manager	*27 02 19*
Tomato Processor Manager	*25 09 18*
Tomato Processor Manager	*07 03 19*
Public event on tomato value chain - various stakeholders	*03 05 19*
Emilia-Romagna Regional Government – Public officer	*02 10 17*
Retailer Food product manager - Sustainability Manager	*12 03 19*
Retailer Buyer for Grocery Processed Food Manager	*23 05 19*
Retailer Food product Manager	*31 5 19*

9. GOVERNANCE OF FRENCH WHEAT TO BREAD VALUE CHAIN

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9.1 EXECUTIVE SUMMARY

At the beginning of the 70's, France had more than 50 000 artisanal bakeries. Within more than 40 years, more than 20 000 establishments have disappeared while consumption of bread has strongly diminished. Consumption of bread in traditional bakeries still represents around 50% of the national bread consumption, which places France in a very specific situation compared to other European countries (where bread is mainly purchased in retailers or cooking terminals linked to the bread industry). However, the industrial bakery (30% of which is controlled by big retailers) are currently gaining a 1% market share over the traditional bakery every year.

The wheat to bread value chain is characterized by a strong integration of downstream links by important cooperative groups: through the integration of big millers and other wheat processors (concerning other wheat value chains) and the integration of industrial bakeries (even if some industrial bakers, like Pasquier, are completely specialised in industrial bread production), and through the strong level of dependency of some traditional bakeries through a franchise system partly binding them to big millers (or unions of big millers). This vertical integration dynamic and the fusion of cooperatives globally tend to increase.

Using the frame proposed by some latest development of the Global Value Chain (GVC) theory (Ponte & Sturgeon, 2013), the governance of the wheat to bread value chain can be described as “multipolar”, as different actors are driving it (meaning partly imposing their standards and prices to the suppliers or buyers), depending on the final form of valorisation. The traditional bakery outlet is strongly driven by the tier gathering cooperatives and millers (usually part of one same group), with millers imposing their standards on flour mixes and valorising better their flour through its sale to traditional bakers - in a rather captive situation - than through industrial bakeries, having better access to other flour providers - in a situation that can be described as a *market* relation. The industrial bakery outlet is driven by both retailers and big industrial bakery groups (which are part of cooperative groups for some of them), in a *relational* situation with millers, as there are still relatively dependent on the flour mix they produce but able to purchase some volumes on markets that are outside the domestic market. The export outlet, mainly dedicated to bread production in foreign countries, and therefore respecting the international milling wheat requirements, is mainly driven by very big international trading groups, in a rather *relational* situation with cooperatives, on which they depend to gather homogeneous seed batching to meet the importing actors’ requirements.

The producers are globally in a situation of captive suppliers towards cooperatives (which are controlling 70% of the wheat market, while wholesalers control 30%). The producers and their cooperatives have to valorise one ton of soft wheat out of two on

the international market, with wheat to bread chain actors being dependent on the international market on three main aspects:

- As the trade barriers for wheat are pretty low (especially for countries benefiting from specific trade arrangements with Europe), domestic market has to align with world prices;
- As the producers and the cooperatives do not always know on which market the wheat will be sold at seeding time, wheat quality has to be adapted to the conditions of both markets (domestic and international) concerning price and quality requirements;
- As the domestic wheat market and the different forms of valorisation of wheat (bread, feed, ethanol, starch…) is relatively saturated, the main margins for growth of wheat actors is related to the international markets (and their current growth in some areas).

But while this dependency on international market tends to grow, producers and collectors tend to have more and more difficulties answering the requirements of the international market, with fierce competition of producers from other countries, especially the countries of the black sea basin in the recent years. These difficulties tend to increase pressure on the domestic market in return.

At the domestic level, the growing pressure of industries using flour and of industrial bakeries (processing more and more flour) on millers tends to increase the pressure on the flour valorisation. Indeed, millers cannot valorise flour with these actors, with stronger bargaining power, as they can valorise it with traditional bakeries, structurally dependent on national market. At the bread market level, traditional bakers also have difficulties to face the increasing capacity of industrial bakeries to ensure a strong diversification of the bread production.

9.2 METHODOLOGICAL PREAMBLES

The VALUMICS project aims at identifying public and private actions that could enhance the resilience, fairness, integrity and sustainability of food value chains for European countries. In view of that objective, the task 5.1 intends to characterize the current governance of selected food value chains (FVC) across Europe and how existing policy frameworks affect this governance. Following a large body of literature, the methodological approach retained here rests on a twofold assumption:

That the governance of a given FVC is a key determinant of its performance – primarily from an economic point of view (economic development, employment creation or poverty alleviation, see Gereffi *et al.*, 2005), but also social and environmental (e.g.Bolwig *et al.*, 2010);

That public policies contribute, to different extent depending on the context, to shape the governance of FVC and, in turn, their economic, social and environmental performances.

The key objectives of the present document are therefore: (i) to characterize the current governance of the wheat-flour-bread chain in the European context, focusing on a case study in the region of Île-de-France in France, to (ii) determine to what extent this determines / influences the overall performances of this chain with respect to the key matter of concerns of the VALUMICS project: fairness, integrity and sustainability.

From an analytical and methodological point of view, the present note approaches the governance of a food chain as the set of intra-sectoral linkages between firms and other actors through which the specific characterization of transactions along chains are negotiated: price, volume, timing, attributes that products *and / or* suppliers should possess, etc. (Gibbon *et al.*, 2008). This governance has to be analyzed at two different levels. First, at the level of bilateral inter-firms relationships, following Gereffi et al's framework (Gereffi *et al.*, 2005), according to whom it can take different forms from market to hierarchy. Second, the succession of bilateral relationships along the chains can (or not) present a sort of *polarity* – meaning that one or several firms *lead* the chain (Ponte & Sturgeon, 2013). Finally, following Gereffi's seminal work (Gereffi, 1999), it is essential to analyse the role of institutional framework and public policies in the shaping of these interactions at both levels (bilateral interactions and overall chain organization).

Following this framework, and considering the objective set out earlier, this note is organized in four main sections. The first section will give an overview of the French bread market, illustrating both its strong dependency with the evolution of international markets and the tendency to see bakery industry and retailers winning market shares over traditional bakery. In the second section, the logics and constraints of each actors of the chain as well as their inter-relationship will be detailed. The overall organisation of the wheat to bread chain and its governance will be detailed in the third section, integrating a specific focus on how public policies impacts/regulate each stage of the chain and the overall chain. The impact of this chain organisation on fairness, integrity, segmentation and environmental sustainability will be detailed in the last section.

9.3 THE FRENCH BREAD MARKET AND WHEAT TO BREAD CHAIN: MAIN FEATURES AND OVERALL ORGANISATION

One of the specificities of the French bread consumption context is the persistence of an important bread consumption through traditional bakeries. As we will see, this state of affairs, if it is partly based on the particular eating habits of French people concerning bread, is more linked to the regulations pushed by the millers for the benefit of traditional bakery (through laws specifying the "traditional" character of bread production) than on consumption habits strictly speaking. One of the other peculiarities of the French context, is that wheat is a key commodity for most farmers. As such, the overall production largely surpasses domestic needs and 50% of the wheat production is exported. Furthermore, most of the exported production is intended to feed foreign bread industries. Therefore, since export volumes for bread production are larger than domestic volumes dedicated to bread production, when export issues are discussed, they directly relate to bread and bakery issues. In this respect, the characteristics of the international market and its evolutions play a key role in the governance of the wheat to bread value chains. Production choices as well as economic conditions of the domestic bread sector are thus strongly dependent on this export market. The world price of wheat determines the prevailing prices within the national sector and the relative difficulty of knowing by advance the future destination of the production at the sowing period pushes actors of both production and storage to cultivate a quality of wheat which will hopefully be as easily sold on the international market than on the domestic value chain. While the volumes of wheat used by traditional bakery actors remained relatively high in France compared to other European countries, leading to a favourable valorisation of flour by millers, this situation tends to change. The volumes

processed by industrial bakery as well as the volumes handled by the bakeries that are internalised by the retailers tend to increase, and in parallel, certain recent chains of bakeries benefit from a greater bargaining capacity on flour than independent or franchise bakeries (closely linked to millers), both through the level of supply they trade and through urban location concerning end markets. We propose to start this case study by an analysis of the characteristics of the market.

9.3.1 THE FRENCH BREAD MARKET AND ITS EVOLUTIONS

With respect to the European situation described above, the French case is characterized by three main features (all data from Passion Céréales, 2017 ; xerfi France, 2018):

- The importance of daily bread consumption, which is nearly three times higher than that of the EU: 120 grams / day for French people *vs* 39 grams / day for Europeans – and although this consumption has been steadily declining since the 1950's (by almost three times as well, from 330 g / day / head to 120 g / day / head). 75 % of the bread consumed is freshly baked "normal" bread, 17 % "special bread" (whole bread, brown bread…), 8 % pre-packed bread.
- The importance of the traditional sector, which still handles and processes a little bit more than half of the flour used in France in the bakery sector and whose market share for bread is still 66 %;
- The role France plays at the EU level (and beyond) regarding wheat production: France is the first wheat producer in the EU, and nearly a ton out of two produced in the country is exported, mostly on the EU market.

The most significative trend in the recent years concerning bread consumption is the increase in consumption of "special bread". This specific market is said to be "better valorised" by actors of the chain, and one of the arguments often put forward by actors in the upstream links of the chain is to say that this better valorisation of a non-negligible part of the production does not impact the upstream actors of the chain, especially producers.

Moreover, and not necessarily intuitively, the industrial bakery or supermarket bakery is sometimes better able to meet this demand for diversification of consumption than the traditional bakery, participating in the tensions between the two branches.

9.3.2 THE CHARACTERISTICS OF THE EXPORT MARKET

Wheat dedicated to milling in the domestic space remains at very stable volumes from one year to another, with volumes of 5 million tons of flour per year used in the domestic industries and bakeries and low flour exports. The share of export, in relation to these volumes, is much larger and variable, oscillating between 12 and 20 million tons depending on the year, distributed between Europe and the rest of the world (see Figure 9-0-1), with Algeria as the main importing country outside Europe and Netherland and Belgium as the main importing countries in Europe. The uses in Europe can be either feed wheat or milling, but the export outside Europe is systematically intended for milling and bakery. As producers and storage organisations do not systematically know the final destination of wheat, the actors focus on the production of milling wheat that can adapt to both domestic and international markets.

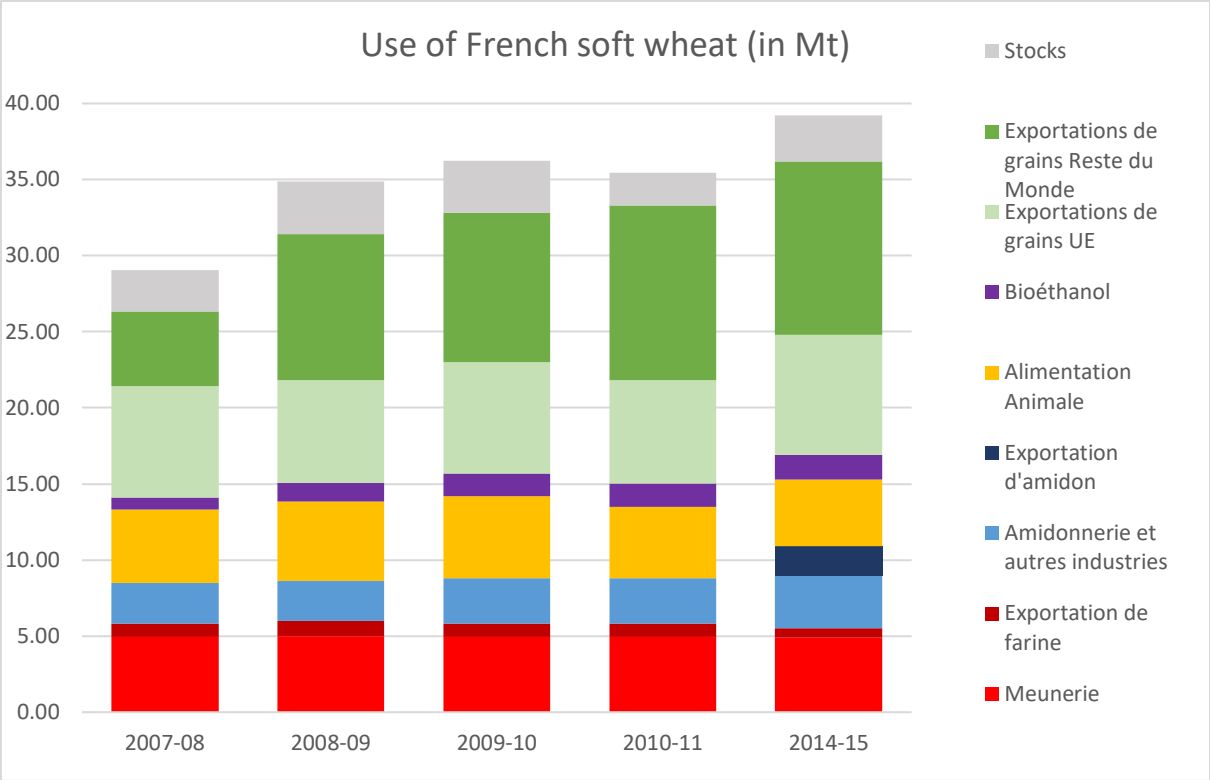


Figure 9-0-1: Main uses of the French soft wheat over the last 10 years

The situations are very heterogeneous if we consider the production of organic wheat and the production of conventional wheat (see Figure 9-0-2) (Charles-Antoine Schwerer, 2016). The organic bread sector is in a very specific situation compared to the conventional sector, with very low exports of grain and bakery products (unlike the conventional sector), a situation to which much be added the fact that the millers are also importing strong proportions of organic wheat (around 40% of the organic wheat processed).

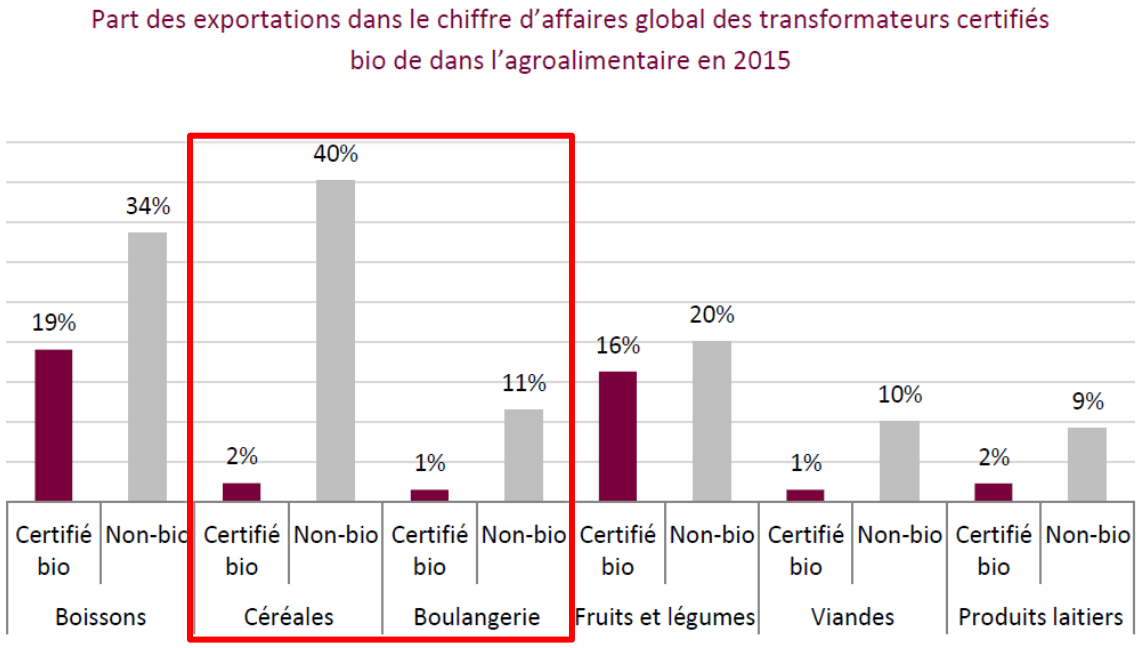
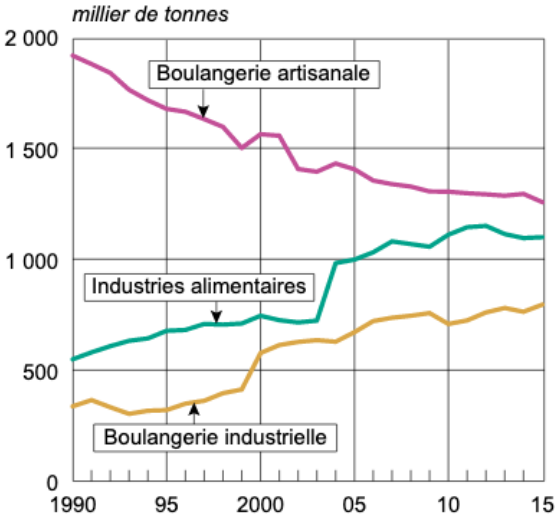


Figure 9-0-2 -Shares of export for conventional and organic wheat and for conventional and organic bakery (source: Asterès with the registries of the trade tribunals, (Charles-Antoine Schwerer, 2016))

9.3.2.1 Situation of the soft wheat market

The grain industry is continually evolving and moving into new products and sectors of the grain value chain, and understanding the use of wheat as milling wheat involves understanding the evolution for other demands based on wheat: biofuels, grain-based chemicals and feed (both at the European and global level). As an example of these evolutions: 100% of the wheat production was dedicated to the production of bread for domestic consumption in 1950 in France whereas only about 15% of the overall production are used for bread consumed in the national space today.

Concerning the wheat market, the tendency is a decrease in the use of flour by traditional bakeries (even though it stays higher than the other uses) and an increase in the use of flour by industrial bakers and by agro-industries using flour (the volumes doubled for both of these actors during the last 25 years) (FranceAgrimer, 2016). See Figure 9-0-3.



	2004	2010	2014	2015
	millier de tonnes			
Boulangerie	2 298	2 243	2 274	2 262
artisanale	*1 431*	*1 304*	*1 294*	*1 257*
industrielle	*628*	*708*	*763*	*795*
grandes surfaces(1)	*239*	*231*	*217*	*210*
Industries alimentaires (biscotterie, biscuiterie...)	982	1 110	1 095	1 099
Alimentation animale	86	57	61	59
Autres	644	815	690	689
dont farines en sachets	210	266	229	212
dont amidon, gluten	3	0,4	0,2	3
Total	**4 011**	**4 225**	**4 120**	**4 109**

(1) Y compris fabrication de pâtes et pains surgelés.
Source : FranceAgriMer.

Figure 9-0-3: Main uses of soft wheat flours on the domestic market (FranceAgrimer, 2016)

9.3.2.2 Export of baked products on the international market

With 2 billion exported on a production of 8.5 billion from the industrial bakery, the export of bakery products represents, in value, the second export sector of French agri-food products, directly after wine and spirits. This export is mainly intended for the German, Benelux and Great Britain markets, but overseas exports (presently representing marginal volumes) is experiencing very significant relative growth, notably through the sale of frozen products reaching Japanese, Chinese, United States or Canada markets. The sector is indeed the only sector that has experienced a greater increase in exports than imports (Ministère de l'économie et des finances, 2018) in the recent period.

9.3.2.3 International competition around soft wheat

Ukraine and Russia entered the wheat global value chain in the late 1990s as they started economic liberalisation. The emergence of Russian producers as leading producers and exporters is linked to the rise of agro-holdings that industrialised agriculture and accelerated farm production while international traders entered the

Russian wheat value chain, invested in exports and improved the linkages of Russia to global markets. In the recent period, Russia has become one of the most important competitors on the wheat market, in front of the wheat producers of United States (who used to determine world prices until recently). Figure 9-0-3 shows that price payed to the producers in Russia are never under their production costs (either for years of highest or years of lowest yields), which puts Russian producers in a position of price makers on the international market (Carel, 2018).

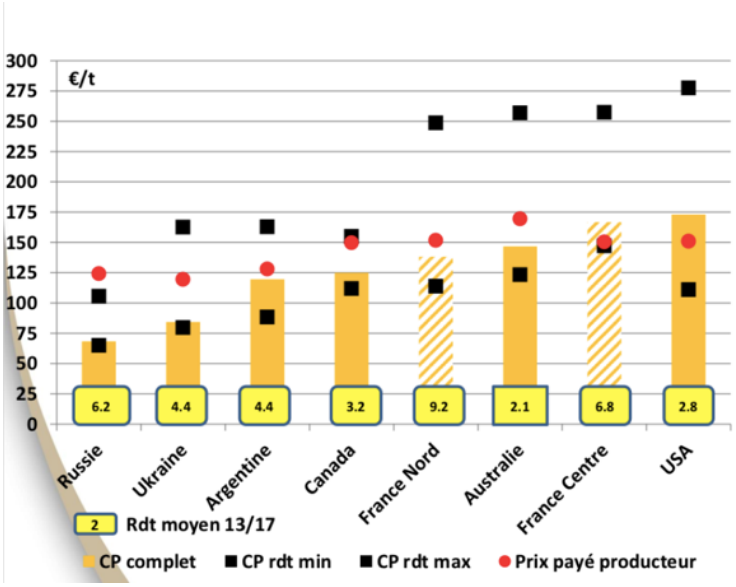


Figure 9-0-4 - Price payed to producers for wheat in exporting countries compared to production costs (Arvalis, 2018)

9.4 THE DIFFERENT LINKS OF THE WHEAT TO BREAD CHAIN, THEIR LOGIC OF ACTION AND THEIR RELATIONS

9.4.1 OVERALL VIEW OF THE WHEAT TO BREAD CHAIN AND ITS GOVERNANCE

The main links of the wheat to bread chain are the following: wheat producers, storage organisations (mainly cooperatives), millers (most of them belonging to cooperative groups), industrial bakeries (some of them belonging to cooperative groups), traditional bakeries (a substantial part of which are affiliated to or a franchise of millers) and retailers (who either heat industrial products or sell them directly baked, or bake bread by themselves in-store). See Figure 9-0-6 and Figure 9-0-7 for an overview of the different actors. As half of the production of wheat goes to the export market, two other links are structuring for the chain: international traders selling grain (mostly independent, but some of them belong to cooperative groups) and importing actors (which can be either public or private depending on the export market). The quality of production required for both the domestic and the export market share numerous prerequisites, but the focus on the dimensions of quality will be slightly different depending on the market:

- the export market, as we will see in section 9.5.2.3, has a strong focus on protein rate and sanitary conditions of batches

- the domestic market has a strong focus on wheat variety, a slightly lower focus on protein rate and

As producers and collectors do not know where the grain will be delivered during the sowing period and even after having been collected, the requirements coming from the two markets are strongly interlinked and cannot be thought of separately.

If we briefly describe the nature of the link that characterizes the transactions between each actor, we can specify the following aspects:

- even if producers can potentially change the collector they are providing, they usually do not change this provider for two reasons: because, for territorial reason and as it is costly to transport grain, they usually tend to deliver their grain to the closest cooperative and the price negotiated is always more or less the world market price
- half of the wheat production is exported, and around a third of the production that is valorised in the domestic market is processed by the milling industry
- the milling industry gathers small and medium millers, often independent, and big millers, which are part of big cooperative groups for most of them. In most of the cases, the relation between cooperatives and millers is therefore partly integrated, as cooperatives often valorised half of the wheat collected dedicated to bread through with their own mills
- half of the wheat processed into flour is valorised through traditional bakeries, and most of these bakeries are strongly tied to the prices and quality of flour proposed by millers, as they cannot supply themselves on other markets and as millers often take in charge some of their initial investments (especially in the case of franchises)
- the other half of flour is valorised through industrial bakeries, other industries using flour and retailers, which have a much stronger ability to provide themselves with flour on other markets and therefore bargain prices in the domestic chain
- concerning export: even if cooperatives have their own export facilities, cooperatives usually depend on international traders for the organisation of export: traders will organise the sourcing from different cooperatives and gather the grain from different places to fill in boats reaching the targeted markets

Two main dynamics strongly affecting this chain can be underlined:

- the fact that the link composed by cooperatives and big millers has experienced a very strong concentration and managed to maintain the capacity to valorise the flour production from the maintain of a high volume of flour through traditional bakery, an outlet that is tending to decrease in favour of industrial actors or retailers
- the fact that export markets, that were historically considered as a feebly challenging outlet for French producers, is becoming a more and more difficult market to supply for reasons both related to quality (especially protein rate) and prices

We will detail these dimensions in the rest of this document, and specify how these dynamics influence the relations between links and how they involve reorganisations of the wheat to bread chain.

9.4.2 CEREAL PRODUCTION AND STORAGE

9.4.2.1 Wheat producers

If we take the example of Ile-de-France, the cereal production is characterized by pretty homogeneous production systems (115 ha in average, arable crops representing more than 3/4 of utilized agricultural land) with very homogeneous strategies and dynamics at the farm level (specialisation and enlargement). The situation can be qualified as strongly socio-technically locked in, with strong interdependencies among actors of the value chain, and hence difficulties to evolve / change (Meynard *et al.*, 2017). The strong specialisation is resulting from both the simplification of rotations, with a disappearance of protein crops in rotation (due to lower yields and lower prices) and the progressive disappearance of livestock (Magrini *et al.*, 2016), leading to farming systems that are strongly dependent on the evolutions of wheat market (price volatility, quality requirement on the export markets, etc.).

As explained above, milling wheat production is experiencing a growing international competition, especially from Russia and Ukraine, in a context of decreasing level of subsidies in Europe and of decreasing number of synthetic crop protection products allowed for production. Three main strategies are currently combined at the farm level to address this dynamic: risk management strategies, production costs minimisation strategies and value-added creation/capture strategies (especially through production contracts, as explained in next section). While the farmers of Île-de-France are among the wealthiest in the country (with an average current income before tax of about 30 to 50 k€ per year and a differential of 10 to 20 k € compared to the average national) (Agreste Île de France, 2016), they have been severely hit by successive climatic and market (especially raw material prices) events over the last 3 years which have drastically undermined their overall economic balance, especially in 2016, leading farmers and cereal chains to strong questioning concerning their future strategies and organisation. At the same time, producers do not notice any improvement in yields and no real decrease in current expenses, inducing a form of stagnation of input efficiency.

9.4.2.2 Which possibilities of engagement in specific contracts and labels?

Producers have the opportunity to engage in various specifications, mostly specifying the conditions of production, storage and processing, and for a minority of them integrating issues about origin of the production and equity of links between the different links of the value chain. We can cite the following contracts or labels: red label, the NF V30-001 norm (formerly called "IRTAC"), the CRC label, ethical labels, regional brands, contracts with restaurant chains and finally the organic label.

The NF V30-001 norm does not contain very restrictive requirements on the production, since it mainly corresponds to the respect of the European regulations. The red label has an implication on the actors of production as on the actor of the mill industry. It concerns the varieties of wheat used, the fractionation of the nitrogen inputs and implies a crushing on grinding wheel (and not with cylinder) while it limits the possible additives within the flour.

The CRC label is a label implying strong conditions on the question of the risks of contamination of production and on pesticide residues (which must be almost nil and implies not to use insecticide for storage) with strong traceability. As detailed in section 0, the CRC model is still a niche sector for the moment, but is seen as a potential way for strong development in a near future.

The specifications for organic farming include the ban of synthetic fertilizers, involving the use of legume crops in rotations and livestock effluents - or other natural organic materials - for fertilizing, and the ban of pesticides (to the exception of certain molecules), also involving control of rotations, mechanical methods of weed management and other forms of pest control than the use of chemicals.

Fair trade labels (such as agri-ethics or agriconfiance) that involve producers, collectors, millers and bakers around guaranteed prices and a fair distribution of value between actors involved in the chain as well as a set of specifications (not very binding concerning production) and a limitation of the transport distance of goods in the case of agriconfiance.

9.4.2.3 Which social organisation between producers and cooperatives to meet the specifications of these contracts?

For a given kind of contract, the cooperative generally seeks to facilitate the allotments in relation to the specification, making sure that the producers producing under specific contracts are not too far apart for a given allotment. Several factors are considered for the allocation of contracts between cooperatives and producers: the territory (and its adaptation to the wheat demanded), logistics (the proximity of several producers for the same allotment and the proximity of the processor concerned), adaptability and willingness of the producers. But the specific contracts giving access to a premium for producers still remain a minor part of the production.

Regarding their choice of cooperative, the producers will generally supply the silo which is located the closest to its production. The producer may potentially supply several cooperatives if his farmland is very fragmented in the territory. As long as he is satisfied with the price negotiations led with his cooperative, nothing leads him to change cooperative. Producers, however, do not find themselves in a completely captive situation with their cooperatives, which therefore remain vigilant concerning the prices they propose for their members, in comparison with other collectors. In other words, competition is partly effective, but within the very strong limits of the territorial opportunities given to the producers which remain very binding as the wheat cannot travel for a long distance without becoming unprofitable (due to transport costs).

9.4.3 WHEAT COLLECTING

9.4.3.1 Relation between collectors and markets

Cooperatives account for almost 75% of the grain collected and wholesalers the other 25%, but they occupy the same function (only the governance is distinct) (FranceAgriMer, 2010). In the course of our interviews, we focused more particularly on cooperatives. The main role of the storage organisations is to optimise the value of all wheat production through sorting, allotments and an optimised coordination between the marketing (volumes and market opportunities) and the allotments handled. The IDF storage organisations will mainly deliver the wheat to the milling industry of the national space (about 80% of the wheat collected). There are therefore regional specialisations in terms of outlets at the French level (higher level of export concerning the northern areas or Eure et Loire, etc.). Some cooperatives are historically rather designed for export and optimised the logistics to move the grain towards the ports, while others are a bit more designed to provide the different

segmentations of the domestic markets. Most grain collectors are combining these different strategies.

Many cooperatives, aiming at optimising the demand/production adequacy, sought to develop vertical integration downstream the value chain in order to improve this adequacy. In fact, facing the growing market segmentation, cooperatives have had to evolve in recent years in their capacity to meet new expectations and to establish specifications. Twenty years ago, the production was still really centred on very commodified wheat. It is still the case, as the wheat market is a market that is led by a world price which is the commodity price, but the specifications have evolved and are gaining in importance. The fact that production is becoming a bit less standardised also tends to complexify grain exchanges and increase the risks on quality factors which were of lower importance historically (the level of protein, the pesticide residues, etc.), while inducing some investments in parallel (for storage for example, in the purpose of pesticide-free storage). The centrality of the protein rate for the valorisation of wheat on international markets (see section 9.5.2.2) led, on the one hand, to the establishment of a specific "protein plan" within the sector aiming both at changing some practices (to ensure a certain level of protein in the wheat grains which tended to decrease while the requirements of the international market were increasing) and at changing the way the protein rate was taken into consideration in transactions along the chain (in order to valorise it).

The general market-orientation of Ile-de-France production, as well as French production in general, is turned towards milling wheat (rather than feed wheat), for which the millers remain the main prescribers in terms of specifications. The fact that most of the exported wheat is dedicated to the milling industry of course amplifies this orientation. Feed wheat is indeed a completely different market, competing with other producing countries and also implying a competition with other commodities used in the production of animal feed (notably maize, on the world market). The feed wheat market is therefore subject to even greater potential volatility than the milling wheat market.

The specifications established with customers represent low volumes, and a tension exists between the capacity to respect certain specifications and the capacity to supply the volumes sold under these contracts. Indeed, the variability in wheat production from one year to another leads cooperatives (and therefore producers) to limit the levels of production under contract in order to be sure of being able to deliver the volumes they were engaged on. In general, if the specifications are too restrictive on the production side and lead to excessive inter-annual risks on the production, there are few chances that the contracts will be adopted. This is what happened with the "agri-confiance" label in 2016, during one of the worst years that producers have experienced in the recent period: the planned quantity could not be delivered, potentially compromising the reputation of the label.

9.3.2.2 Grain logistics

The displacement of a ton of grain implies a high relative cost (to the extent that each ton of grain represents a low price in relation to the weight transported, compared to processed products or many manufactured products for example), the question of the logistics of grain (from the producer to the cooperative, from the cooperative to the processors or export areas, etc.) is therefore at the heart of many issues:

- on the one hand, it is particularly crucial in the competition between cooperatives: it is part of the room for maneuver they can optimise to stand out from each other;

- on the other hand, it is critical in the capacity of processors of the national territory to keep on using domestic production despite the fact that the weight of the ton of grain might be higher than some foreign production at the gate of the cooperative: in other words, the transfer of foreign grain generally makes it lose its comparative advantage, except in border areas, as it is the case for certain transfers of grain from German producers to cooperatives located in the French area.

In general, logistics is considered "very optimised" in France compared to other foreign productions. The level of transactions usually oscillates around 150 to 200 euros per ton, of which approximately 30 euros correspond to the logistics costs in the national space (Carel, 2018). Cooperatives can easily move large volumes to ports. According to some stakeholders, it seems hardly conceivable to significantly improve these logistics costs, which in some cases are rather tending to deteriorate with certain problems of train or truck traffic:

> "We are told that we could win 10 to 15 euros in the industry, it's wrong, we have the best logistics in the world today, because we are not in a very big country if we compare with Australia or with the United States. Therefore, to transfer grains produced in France to the ports to load them and take them to the customers, we are doing good, we are efficient. It might be less the case tomorrow as we have train problems, truck problems and logistical problems today so we have a risk of having our intermediate costs deteriorated rather than seeing them improve. We might be able to improve them a bit if we restructure the way grain is collected. " *(task officer on grain production in the cooperative syndicate)*

9.3.2.3 Grain transactions between producers and storage organisations

Two forms of transactions between the producer and the cooperative can be implemented:
- a principle of "average prices", in the frame of which the producer completely counts on the cooperative that he supplies to ensure both marketing and price coverage through futures markets in order to propose to the producer an average price corresponding to the mean sales of the campaign led by the cooperative;

- a principle of "firm prices", in the frame of which the producer negotiates himself the selling price with purchasers of raw materials, using hedging tools by himself in parallel.

The firm price principle does not necessarily imply that the producer ensures storage by himself on the farm, the grains can be stored at the cooperative without being legally "sold" (there is therefore a disconnection between effective sale and grain transfers)

Globally, the analyses carried out by farm management advisory indicate that the average value obtained by the producers remain the same, regardless of the price principle adopted (average prices or firm price). However, the pool of producers that are more involved in selling by firm price show a greater variability in results among them, some being highly specialized and others less effective in managing sales by themselves.

9.3.2.4 The storage issue

The 1st and 2nd process industries do not store high amount of grain anymore, since they have been adopting lean production since the 1980s-1990s. The question "who invests in storage capacity?" is a question to which storage organisations and producers give differentiated answers. Some storage organisation think it is necessary for them to store grain in order to preserve the loyalty of farmers, and some are rather willing to partly subsidise farmers to store on their own. In the latter case: the farmers

only ensure the conservation while the storage organisations keep on playing their role of cleaning, sorting and allotment.

One of the strategies of segmentation for which cooperatives tend to invest in the present period is aiming at "zero pesticide residues" production. This involves both controlling the use of pesticides so that no residues remain on the grain at harvest and using silos equipped with thermoregulators aiming at preventing the development of insects (without the use of pesticides) during the storage period. Cooperatives cannot use some old silos on this type of storage because the insecticides often remain for a period of several years on the walls. New potential investments in new silos are therefore required. Ongoing reflections for strengthening the development of wheat without residues are at the heart of the potential strategic pathways of the wheat sector presently (see sections 0 and 0).

9.4.4 MILLERS

We can distinguish:

- The large millers, transforming important volumes for traditional bakery, industrial bakery and other industries using flour, historically partly turned towards the export of flour (before its strong decrease in the 1990-2000),

- The small and medium millers, exclusively focused on the domestic market, and generally in connection with the traditional bakery.

France was the leading exporter of flour in the 1980s. The export of flour, however, went from several million tons to less than 200,000 tons today, mainly because millers have settled in importing countries and because other more competitive players in flour exports (notably Turkey) have emerged in the flour world market.

Since mill exports have dropped drastically, mill industry is often presented as being in a situation of structural overcapacity, involving high structural costs compared to the volumes processed. A situation that explains, for some stakeholders, the weak results (in terms of gross margins) of this industry (although this issue is controversial among stakeholders and it is possible that gross margins may vary from one mill to another - as margins discussed in the public debate are generally the "average margins").

A large number of cooperatives have invested in the first processing step, milling, and some have also invested in the second processing step, bakery. This vertical integration, however, does not correspond to a logic in which any actor of the chain (either the cooperative or downstream units) would determine prices throughout the chain, without competition. Each actor remains, despite buy-outs from actors above, in an open, competitive market, and guarantees the profitability of its unit just as if it were an independent unit. The cooperatives therefore run their mills as independent units, especially as these mills are forced, for logistical reasons, to look for supplies from other grain collectors and as cooperatives will themselves sell part of their production to other millers, **usually mainly taking into account distance issues.** If we take the example of Axereal group, one of the largest French grain cooperatives, 50% of the grain dedicated to milling is crushed by their own mills, while the rest is processed by other operators (Axereal, 2018).

The flour market is often referred as a "mature" market by stakeholders, under pure competition conditions: it is impossible to overpay grain supply knowing that the competitors will necessarily pay it at it's "right" price, for which the world price always

remains the arbiter of transactions within the domestic sector. If flour imports are today marginal, it is today mainly because there is still a logistical cost, establishing an indirect "barrier" against the potential entry of foreign flour into the national market. However, flours from contiguous countries, such as Belgium or Germany, may be traded, in particular with the industrial bakery, processing larger volumes. The industrial bakery, in general, is therefore less "captive" towards the mill established in France than the traditional bakers are.

At border levels, imports of German or Belgian flour may be more frequent (this is the case for the retailer Lidl with German flour for example). At a broader level, the Kazakh and Turkish mills are reputed to be the most competitive in terms of price, so that they can supply most markets. This situation, in the case of Turkey, is also the subject of litigation in arbitrations under the laws governing international trade, Turkey being accused by some actors of practicing a form of dumping on its grain process into flour. At the level of supply itself, most stakeholders consider that the Turkish flour does not meet the industrial quality required, meaning that the industrial bakery will generally not purchase this production.

Production from the mill industry is a combination of flour and additives, the mixture of which is often held relatively opaque, aiming at providing a form of industrial stability of use for bakers. Several dimensions of relationship between traditional bakers and millers put traditional bakers (independent or part of a franchise) in relatively captive situation:

- the millers partially control the content of the new baker training courses;

- the millers also sometimes establish watches concerning commercial spaces for bakers to settle;

- millers very generally help bakers in their investments (especially during the installation phase) and also provide some furniture items in the case of franchise;

- finally, the millers propose mixes of flour adapted to the brands that the franchises commercialise.

The large millers aim at all types of outlets: the artisanal bakery, the industrial bakery and the industries using flour. These last two buyers benefit from two types of "advantages" compared to traditional bakers (generally more isolated) in terms of bargaining capacities: the level of volumes purchased and the ability of analysing the flour market. For these reasons, the mill industry has encouraged in France the maintenance of traditional bakery, and continues to support it although the latter is currently tending to lose market share (as seen on 9.3.2.1)

9.4.5 BAKERS

With nearly 64% of the retail distribution, traditional bakery has withstood the development of modern forms of distribution and hot-spot chains in France. This can be seen as the result of several factors, which have been extensively discussed for quite a long time: the attachment of French people to the “traditional baguette”, the collective action of craft bakers to limit the development of industrial bakers based on a collective representation of the nobility of the work of craft baker (Bertiaux & Bertiaux-Wiame, 1980), and last but not least the energy put by large millers to maintain craft bakers which represent by far *their best and captive customers*: traditional bakers indeed pay the flour at a more expensive price while the industrial bakeries are in a

better position to negotiate, because of the large volume they buy. To illustrate this point, let us take the recent example of Terrena, one of the largest Cooperative group involved into the milling industry: in 2016, its sales to industrial bakers represented 75 % in volume – but only 62 % in value – while its sales to craft bakers represented 17 % in volume and 28 % in value!

From the 1980's to the mid 1990's, the market share of traditional bakers had indeed tended to erode, after long years of resistance: from nearly 90 % at the end of the 1970's, it declined to 74,4 % in 1995, at a more and more rapid pace. Numerous initiatives were taken by the milling industry to counter this trend in the 1980's: the development of training to attract new people in the craft baking sector and favour the development of new businesses; the creation of new flour mixes to facilitate the preparation and being of special bread (whole bread, brown breads, etc); the launch of large scale communication / marketing campaigns around "bread brands" associated to specific flours provided to craft bakers by millers (Banette, Baguépi, Festival…); development of a number of services to bakers: advice and financial, accounting and technical support in particular (Scala-Riondet, 2005).

All these efforts have progressively coalesced into a legislative proposal that was eventually approved in 1998 after long years of negotiation. The law (JO n°120, 26 mai 1998, art. L. 121-80) stipulates that professionals who do not ensure the kneading of the dough by themselves, its fermentation and shaping as well as the bread baking cannot use the name "baker" and the commercial sign of "bakery" for their point of sale. The dough and the breads cannot at any stage of the production or the sale be frozen or frozen.

This regulation played a determining role in limiting the slow decline of traditional bakeries. This is well illustrated by the fact that after the law was passed, traditional bakers continued to lose market shares but a much slower pace than during the past decades. It has indeed lost less than 10 % of market share from 1996 to now, in more than 20 years, while between 1979 and 1996, in around 17 years, it had lost more than 15 %.

After WWI, the difficulties of seeing the children of bakers taking over the bakery of their parents led to a form of institutionalisation of the compulsory weekly rest day for bakers. This regulation is still operative in most French departments. The will to respect this regulation constitutes a real ideological demarcation line between the actors of the traditional bakery and the actors of the industrial bakery, the first being generally favourable to its maintenance while the second ones carry out an important lobby (through the Bakery Companies Federation) to abrogate these prefectural decrees and ensure a permanent production of bread for industrial bakers.

"They are in lawsuits in many regions concerning decrees since the Bakery Companies Federation asks to abrogate the prefectural decrees which force the weekly closure. It is a war between the two. And as the urban consumers are accustomed to get everything, right now, all the time, it's true that the Bakery Companies Federation says that they have consumers on their side. " (general delegate of the Bakery Companies Federation)

The relationship between the milling industry and the bakery (industrial or traditional) is often referred to as a mix of interdependence and conflictuality. The bakery actors themselves tend to call it "unbalanced" and "paternalistic". One of the recent events that may illustrate this imbalance is the fact that the recent repeal of the flour tax (which historically contributed to agricultural pensions) did not have an immediate impact on

the price of flour. In this context, the Bakery Companies Federation had more capacity for legal and institutional pressure to ensure that the millers turned this tax abrogation into a decrease of flour prices. Moreover, at a purely commercial level, the industrial bakery, unlike the traditional bakery, has the ability to purchase flour from other markets.

9.4.5.1 Traditional bakers

Franchise and independent traditional bakers

The actors of the traditional bakery, even if they remain the main outlets for bread, tend to lose market shares in the competition against cooking terminals and supermarkets. This loss of market shares can be explained by various factors: consumption mode issues, purchasing power segmentation and capacity of the industrial bakery or supermarkets to meet the demand for diversification and quality required for bakery products. Independent bakeries and franchised bakeries are globally very captive of the milling industry in their commercial relations (even if this is particularly pertinent for franchises) for reasons that are both economic and technical:

- firstly, they are often assisted (financially and organisationally) by the milling industry in their installation phase and they do not have the capacity to supply themselves on external markets,
- - secondly, they are dependent on the flour mix that millers produce (the formula of which is sometimes partially opaque) and which favours the stability of production.

Such a stability of the production in relation with the quality of the flour makes it possible to homogenise the work in bakery (baking time, adaptation of the breads to different conditions of production, etc.) and to make profitable their work in the face of the strong competition of the other bakery actors (Astier, 2016). A strong diversification towards complex breads involving more heterogeneous and complex production methods necessarily implies additional costs (for raw material and workforce) that impact the price of bread and leads to target a wealthier clientele (strongly dependant on the location of the bakery).

Traditional bakery networks

The industrial bakery, as the traditional bakery (independent or in franchise with millers) have been recently suffering the competition of a new type of actor (Marie Blachère, Ange ...), network of bakeries that rely on their bargaining capacities for the purchase of flour (network gathering allowing to trade larger volumes) and new forms of implementation strategies. Indeed, faced with the traffic difficulties in the city centres of small and medium-sized agglomerations, these bakeries are located preferentially in locations where it is easier for consumers to stop and park, often on the outskirts of city centres. The artisan bakers who are in city centres, with a certain traffic and parking restrictions, saw their clientele decrease, just as for some other downtown businesses (even if, for other businesses, online selling also had a significant effect on their businesses). In this respect, spatial planning and urban planning become drivers of the changes of dynamics within the global governance of the sector.

9.4.5.2 Industrial bakers

As mentioned above, industrial bakers are far less captive than traditional bakers. Today, the bakery industry manages production that spreads over different quality

spectrums and assumes the production of a variety of types of bread, while the big retailers internalise the bakery function in some of its outlets. All these dynamics are both the sign of a form of significant competition between the traditional bakery and the other bread channels and the driver of new relationships between the millers and downstream links.

Actors in the traditional bakery, while tending to denounce the practices of the industrial bakery which, according to them, tends to take their share of the market, are however held by certain relations of dependence with the bakery industry to the extent that they get most of their supplies from manufacturers for all the products that complete their range of breads (viennoiserie, certain pastries, etc.).

Regarding the relationship between industrial bakery and supermarkets: it is generally described as tense in terms of price negotiations. A recent example has been the difficulty in passing on the increase in the price of a tonne of butter in pastry sales. The industrial bakery then approached the government's trade mediator on this issue. The artisanal bakery is not as organized as the bakery industry to mobilize these tools.

Industrial bakery outlets are mainly large-scale retail, out-of-home catering (including local authorities catering and some restaurant chains) and the export of frozen products. As such, the customer is not systematically the same as for the bakery, with the exception of supermarkets, which is generally aimed at the same potential customers.

The following Figure 9-0-5 shows the evolution of industry bakers market share between 1992 and 2012:

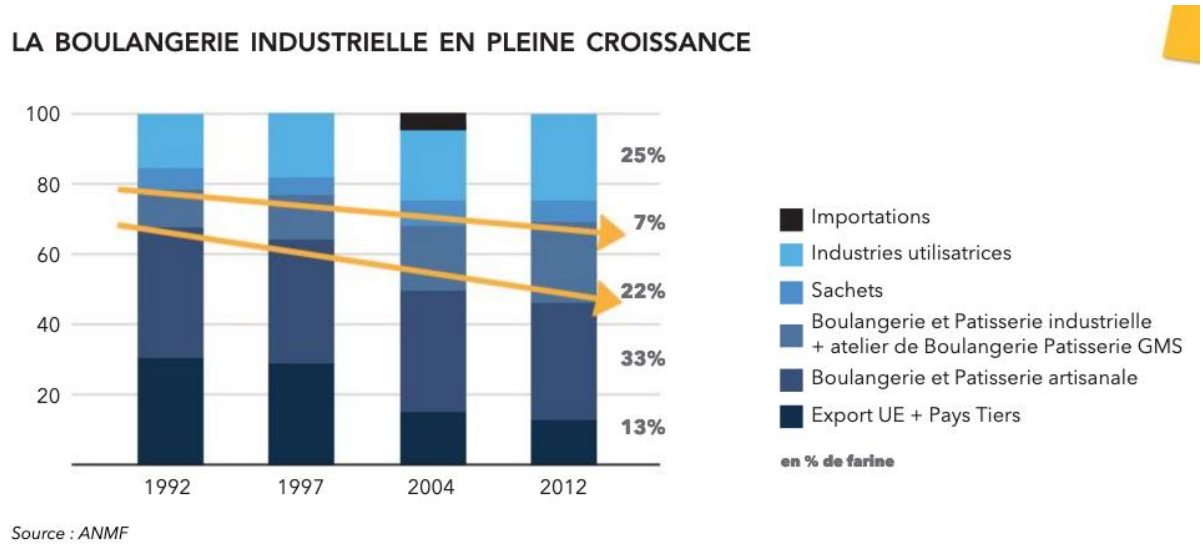


Figure 9-0-5: The rapid growth of the industrial bakery

9.5 THE WHEAT TO BREAD CHAIN GOVERNANCE

The evolution of governance and the dynamics of value chains is subject to a series of heterogeneous drivers. The nature of the trade relations between the different links of the value chain can be the result of particular public policies (the legal framework for traditional bakery determines the maintenance of flows between the millers and traditional bakery for example), but the nature of this relationship can themselves evolve as elements of the context change. The structuring contextual elements in the

case of wheat to bread chain include: the evolution of the competitiveness of other production areas and their capacity to provide a certain quality of wheat (with the issue of the protein rate at the heart of transactions); the more general evolution of the export market and the capacity of the actors to co-manage the export market and the domestic channels; the capacity of certain flour-user actors, tending to represent more and more substantial volumes, to be able to be supplied (effectively or potentially) on flour markets outside the national space; and finally the capacity of the actors of the bakery sector to adapt and respond to changes in demand. We will examine these dimensions and try to clarify what the recent dynamics imply about relations between actors to help qualifying the capacity of the wheat to bread chain to answer the key issues examined in the framework of the VALUMICS project.

9.5.1 Relations among key actors and governance of the wheat to bread chain

As we can see in Figure 9-0-6: out of 36 million tons of grain (mean production), half of it is exported while 6 million is used for the flour industry, 3 million of which will be used for bread making (with 50% used by the traditional bakery) (OFPM, 2018). As we can see on the figure, if most of the determinant of quality are the same for the export and the domestic market, what is constitutive of the quality can also be different for some dimensions (sometimes concerning only one part of the production: organic production, no pesticide residues production, etc.). The figure exposes the different public policies influencing the different stage of the production. The specificities of these policies are detailed in section 0. The chains can either be very vertically integrated, with traditional bakeries in franchise with millers themselves belonging to cooperative groups or industrial bakeries belonging to independent big milling industries or millers that belong to cooperative, or less integrated and involving commercial relations that leaves more or room for manoeuvre depending on the stage of the chain and the market conditions.

The Figure 9-0-7, focuses on the commercial relations of the different actors along the chain: they ability to determine the quality requirements and their ability to bargain prices with suppliers, or buyers.

Using the frame proposed by some latest development of the Global Value Chain (GVC) theory (Ponte & Sturgeon, 2013), the governance of the wheat to bread value chain can be described as “multipolar”, as different actors are driving it (meaning partly imposing their standards and prices to the suppliers or buyers), depending on the final form of valorisation. The traditional bakery outlet is strongly driven by the tier gathering cooperatives and millers (usually part of one same group), with millers imposing their standards on flour mixes and valorising better their flour through its sale to traditional bakers - in a rather captive situation - than through industrial bakeries, having better access to other flour providers - in a situation that can be described as a *market* relation. The industrial bakery outlet is driven by both retailers and big industrial bakery groups (which are part of cooperative groups for some of them), in a *relational* situation with millers, as there are still relatively dependent on the flour mix they produce but able to purchase some volumes on markets that are outside the domestic market. The export outlet, mainly dedicated to bread production in foreign countries, and therefore respecting the international milling wheat requirements, is mainly driven by very big international trading groups, in a rather *relational* situation with cooperatives, on which they depend to gather homogeneous seed batching to meet the importing actors’ requirements.

As we have explained, producers are quasi-captive towards their cooperatives and can manage low volumes with other channels, mainly for territorial reasons and commitment to the cooperatives. Moreover, the price is always negotiated around the world market price, and only the premium, often representing a small difference (around 5 to 10% of the world price, except for organic production, the price of which can be double compared to conventional production) can be partly negotiated within the chain, leaving a little room for manoeuvre.

The mill industry is a very concentrated link, with more than 50% of the volumes processed by four mills, and with most of the production collected by the biggest cooperatives processed through their own mills.

Concerning bakery, traditional bakery, either independent or franchise, are captive customers which still manage to make profits at the individual scale, but which tend to lose market shares at the global scale, reinforcing the competition among them. As we have explained before, the high level of volumes valorised through traditional bakery is very specific to the French context though, based both on the specificities of bread consumption and the ability of millers to protect this outlet in 1990's. This increased competition among actors of traditional bakery tend to reinforce their dependence on flour mixes made by the millers which allow stability of the bread production at the bakery level, and reinforce their dependence on the purchase of viennoiserie and pastry bought to the industrial bakers, as it would be too costly for some of them (especially the ones located in areas with low buying power) to ensure the production other than bread by their own.

In parallel, industrial bakeries, retailers and industries using flour tend to increase their market shares and progressively increase their ability to negotiate flour prices as: the flour proposed on the European market by foreign actors tends to meet the requirements of these industries and the volumes these industries can purchase as individual actors (themselves experimenting concentrating dynamics) tend to increase. Meanwhile, the growing difficulties of the French production to meet the requirements of export markets leads, in return, to tensions on the domestic market that the growing segmentation of bread consumption (through the increasing level of consumption of "special bread') partly allows to absorb through increased added value, an upstream segmentation that has low impact on the income of producers though. The growing ability of industrial bakers and retailers to propose a high level of diversification of their bakery products has a strong effect on the traditional bakery as well, participating to make it lose some market shares.

All these dynamics is leading to the fact that a value chain that used to be driven by cooperatives, both concentrating and ensuring a vertical integration of the wheat chain, is progressively more and more driven by industrial bakers (which, for some of them, are part of cooperative groups) and by retailers. This dynamic currently has an effect on the institutional organisation of the chain itself, with industrial bakers and retailers entering the decision-making circles of a chain that was historically steered by cooperatives and millers.

Globally, the most important trends leading to reconfigurations of relations between actors and to logistical and organisational restructuring seem to be the following ones:

- difficulties in selling on export markets leading to: a reinforced need to adapt the production to the specifications of import actors, an increased protection of the internal market that can go through logistical optimisation and support to quality

standards focusing on health issues (like the no residues standards) in discussion with downstream actors;

- the reinforcement of the volumes managed by actors that are more able to exert pressure on the millers concerning the prices of the flour (by their handling of large volumes and by their capacity of analysis of the market): the industries using flour, industrial bakeries, supermarkets and the recent establishment of bakery chains, independent from the millers and deploying a very specific location strategy to guarantee the outlets.

Concerning export, the fact that big international traders have the ability to organise export, and somehow negotiate export prices, over the trading organisations led by the cooperative groups is a concern for the cooperatives, and a subject of reflection at the moment. Some cooperatives judge that cooperatives, even if they among each other, should focus on their common interest on export to build strong exporting tools at the national level (or even at the European level) in order to counteract the quasi-monopole of the biggest trading companies.

We will give more details concerning all these dynamics and factors influencing the wheat to bread chain governance in the following section:

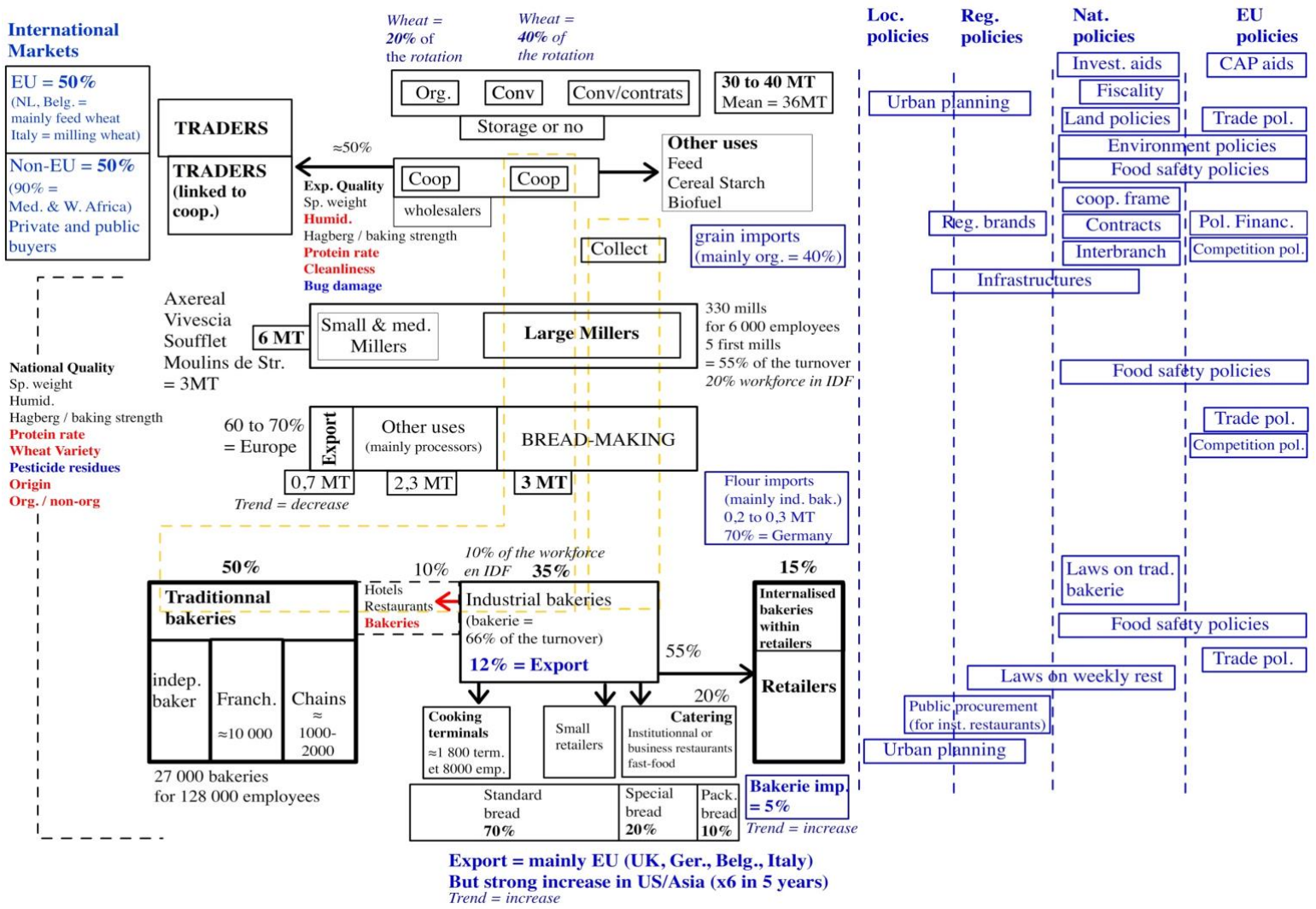


Figure 9-0-6 -Organisation and flows of the wheat to bread value chain and public policies influencing the different stages of the chain

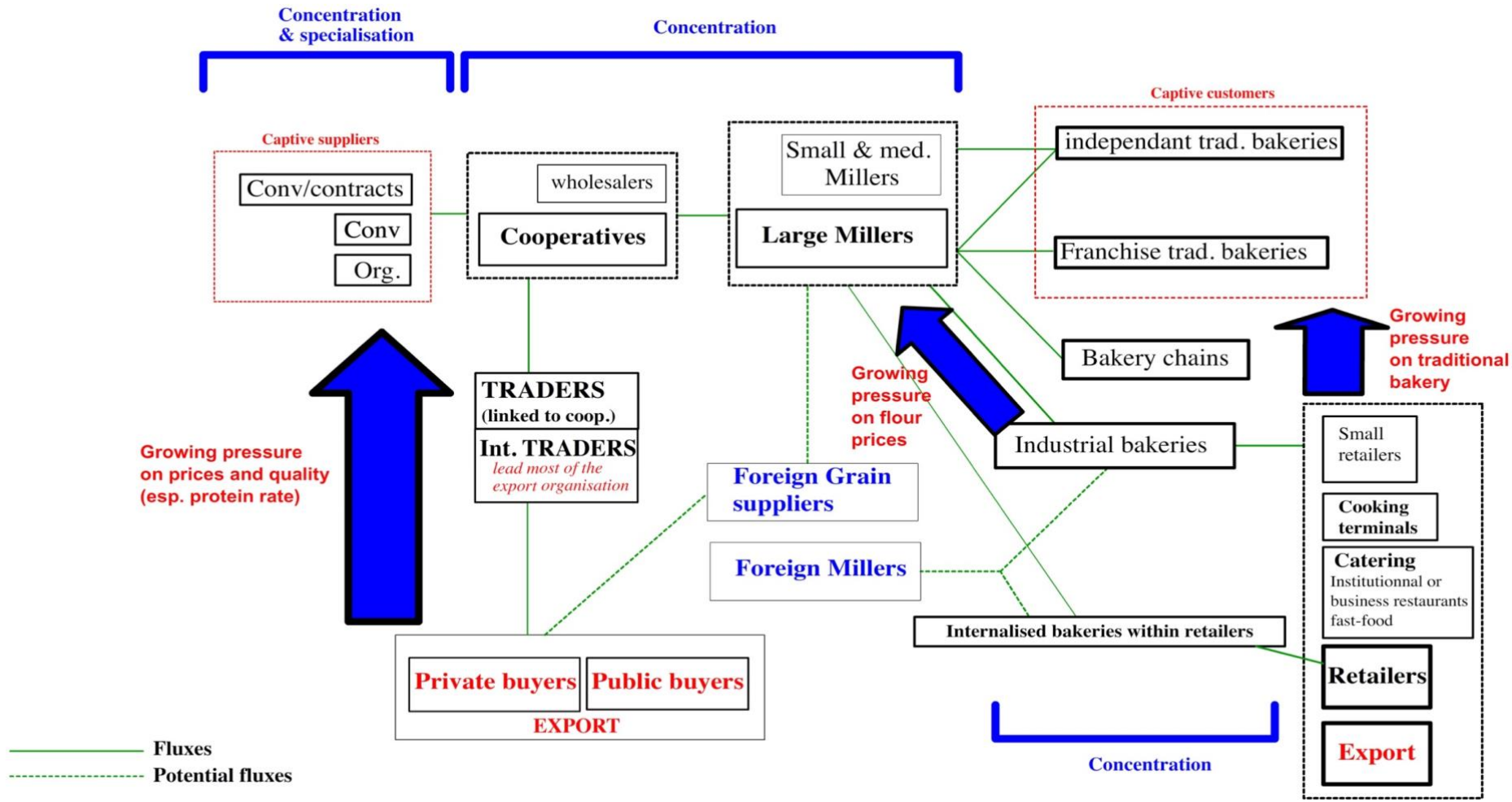


Figure 9-0-7 – wheat to bread chain governance

9.5.2 MAIN DRIVERS OF THE TRANSACTIONS WITHIN THE WHEAT TO BREAD CHAIN

9.5.3.1 Quality issues at the core of the chain 221rganization

The industrial characteristics of wheat generally required for both the domestic and the export markets are as follows: a minimum specific weight of 76 kg/hl, a minimum protein rate of 11% and a Hagberg fall time of 220 seconds minimum (these three characteristics correspond to the standards covered by the futures markets). Apart from productions with specific specifications on production practices, national or international buyers can then have requirements on the level of cleanliness of grain lots or the level of insects (or “bug damage” indicator).

At the national market level, except for production under contracts, most millers apply the internationally applied specifications. Some of them completely prohibit the presence of bug damage, and many of them impose some milling variety selection, issued by the ANMF (Association Nationale des Meuniers de France). The issue of variety remains one of the main differences between domestic market injunctions and export requirements.

The case of the protein rate, very central in the exchanges and progressively accessible at lower prices, makes it a specific criterion on which it is necessary to develop, as it largely conditions the current exchanges and the chains of decision/organization of the wheat sector.

9.5.2.2 The protein rate issue

Protein rate can be an attribute for all forms of wheat valorisation, and as such become central in the production as the destination of wheat is rarely planned in advance. For starch production: a high protein content makes it possible to enhance the value of by-products (especially gluten). For the production of feed: a good protein content in wheat reduces the necessary costs of protein supplements (which soya meal can bring for example). High rates make it easier to maintain the wheat gluten networks (which will facilitate the rising of bread) in the industrial process and help maintaining wheat and flour in changing conditions (moisture, heat, etc.), sometimes specifically adversaries in African bakery chains. All these dimensions reinforce the centrality of the protein content to guarantee certain industrial qualities.

The situation is presently as follows:

- the demand on the protein rate in the domestic market is a little weaker than in the international market but remains important;

- on the international market: this rate has become one of the central conditions for market access.

The fact that the potential destination of production is most of the time undetermined leads to the fact that the protein rate stays a central factor in decisions on production and on the chain organisation. Given that half of the wheat production is valorised through export, there is a general interest for the sector to strongly valorise this protein rate. This dimension has led to the implementation of a public policy that does not oblige the remuneration of the protein but which requires to mention the rate of protein at each link in the transactions. When this rate becomes transparent, actors start getting more systematic compensation for it.

Such a policy, if it *a priori* allows a better remuneration of the producers on a key dimension of the quality of the production, can also create new risks: this creates

territorial differences at the national level which did not necessarily exist before. Protein levels are indeed higher in IDF than in Normandy. The production sector also takes the risk of publishing the fact that they have low rates, potentially declining the value of their production on the world market some years. Moreover, the protein is not systematically remunerated at stable levels depending on the year, with regard to the global offer.

Protein levels depend on exogenous and uncontrollable factors, such as climate, and endogenous factors, such as the crop variety or the management of nitrogen inputs. From the actors' point of view, too coercive policies on the management of nitrogen inputs (like the nitrate directive) jeopardize the ability of producers to meet these specifications. There is therefore a contradiction between the environmental imperatives relating to water quality and the growing demands for high protein rate on the international market. The actors often cite the case of Denmark, having drastically applied the nitrate directive and having seen much of the wheat of its producers declassed in feed wheat, much less valued and subject to greater market upheavals than milling wheat.

9.5.2.3 The strong influence of export on domestic production and governance

Impact of export quality on the sector organisation

As we have pointed out, the protein rate has a central role on the possibilities of marketing wheat in world markets, and these global markets are crucial for the flow of wheat production. For example, bread chains in Algeria alone use as much French wheat as the entire French bread chain (about 4.5 to 5 million T/year) (FranceAgriMer, 2015). In this respect, one of the Algerian specifications specify, for example, the necessity to obtain a wheat quality with a bug damage rate of maximum 0.2, an indicator on which production from French territory is more competitive than most other productions. Just as the protein rate, the situation however tends to change. Russian producers have thus gone from 10% to 0.5% of bug damage in 10 years. Several reasons may explain the centrality of the protein content, beyond the strengthening of the flour's ability to maintain its industrial qualities in heterogeneous conditions. Indeed:

- for some countries outside EU, bread can be an important source of protein (more than in Europe where substantial quantities of cheese, meat, etc. are eaten).
- in terms of the flour production process: beyond the adaptation offered by a high level of protein at different climatic conditions, the high protein rate can make it possible to promote adaptation to very different process conditions or training conditions/skills from one country to another or within the same importing country. Here again, the high protein rate can play the role of a form of "insurance" on bread production, however the bread value chain is organised.
- moreover, and this is one of the central points justifying the strengthening of the "race for protein" over the past decade: as the Black Sea countries are able to produce wheat with high levels of protein at attractive prices, the specifications of the importing countries tend to increase their demand on this rate. If we take the example of the specifications of the public office in charge of a large part of the purchases of wheat in Egypt, the latter has increased its requirements from 10 to 11.5 concerning the protein level in about 15 years.

We can note that the public or private nature of the buyer of wheat modifies part of the logic of export: a private buyer reasons generally on the basis of his ability to manage a particular type of flour, while a public buyer tends to take a grain quality that will meet the requirements of all its bread sectors, sometimes very heterogeneously organised. This specificity of logic of the public purchasers can lead to reinforce the tendency to raise the specifications in favour of high protein levels. If we take the example of the countries of the Mediterranean basin, the situations in this respect are variable. In the case of Algeria or Tunisia: the public office has a monopoly; concerning Morocco: it is a series of private actors; while in Egypt, the two types of markets coexist. Moreover, a public purchaser can potentially integrate diplomatic logics into his purchases, which may lead to favouring one or another importer over another according to the diplomatic or commercial situation between the country and the origin of exports. This diplomatic nature of purchases may, however, be limited by the price signal (which may favour the exporter at the lowest price), particularly in countries where security of bread supply is a strong political issue.

Moreover, the type of bread consumed in the importing areas is structuring on the capacity of French producers to be able to align with the demand: where there is a strong production of baguettes for example (that is to say a baked bread, without mould, needing to be able to stand on its own during cooking), French wheat is very adapted and suitable. This corresponds to the types of breads consumed in the Maghreb and French-speaking sub-Saharan Africa. Anglo-Saxon soft bread requires a high-protein flour, which French producers can find much more difficult to supply (especially compared to production from the United States, and now Russian wheat). The relation price/quality is thus the main driver of the organisation of the international market, with the protein rate at the heart of the industrial quality required in transactions.

Impact of quality and export conditions on the organization of the production & storage actors

Concerning cooperatives, the latter will generally focus its work of sorting and allotment on the basis of the criterion of quality which will be the limiting factor of the year. This dimension makes it all the more difficult for years for which several quality criteria are inadequate with the requirements of the market.

If the whole sector manages to get together and organise itself on certain major issues concerning all the actors (the establishment of the transparency of the protein rate, the good functioning of the futures markets, the maintenance of appropriate milling attributes of wheat etc.), storage organisations remain competing actors, developing differentiation strategies to stand out from the competition, which tend to strengthen as tension on export markets (which historically had a simple role of “outlet”, without significant requirements) are increasing.

Thus, the sector strategy in which the cooperatives are more or less committed according to their level of involvement on the world market, is based on the observation that there is not an average world market, but different markets for wheats of specific qualities. The current reflections in the sector are therefore going towards the idea of reinforcing the identification of qualities available or potentially cultivable under good conditions at the French production level, in a logic of adaptation to the heterogeneous specificities of the different export markets. Such a strategy then implies, for the actors

of the French sectors, to see how they can organize themselves from the selection of new varieties to the marketing with respect to these orientations.

9.5.3 THE ROLE OF PUBLIC POLICIES WITHIN THE CHAIN

9.5.3.1 Key French and EU policies and regulations concerning the wheat to bread chain

The following table (Table 9-0-1 details the nature of the effects of different public policies at different levels of the value chain). Some policies affect only certain categories of actors while others affect all actors or several categories of actors.

Table 9-0-1 - List of public policies affecting the actors of the wheat to bread chain and their purpose

Link of the chain	Public Policy	Purpose of the policy
Producers	Investment aids	Subsidies for investments
	CAP aids	Subsidies to farmers
	Subsidies on insurance	Subsidies for climate insurance
	Regulation of production	Recording of phytosanitary treatments, hygiene measures, etc.
	Nitrate directive	Regulation on levels of fertilisers inputs
	Tax facilities	Tax exemption for investments
	Land policies	Regulation of land transfers to consolidate access to land to farms
	Urban policies	Decision on land use (dedicated to agriculture or construction) / have an impact on potential land use for farming, especially in urban areas
Storage organisations	Legal frame for cooperative groups	Allows cooperatives to mix their activities between private affiliates and cooperatives
	Financial policies at the European level (MiFID II)	Gives a legal frame to the futures markets regulation
	Safety rules on grain collection	building maintenance, prevention of cross-contamination, infection control, supplier identification, HACCP procedures, etc.
	Regulation on silos	Safety rules to respect for silos building (ventilation, hygiene, waste management, etc.)
	Safety rules on commercial activities	Sites registration, traceability, movements recording, labelling, quality analysis
	Transport regulations	Traceability, containers control, activity recording, etc.
	Infrastructures policies	Road, trains, ports, etc. allowing grain transfers

Millers	Safety rules for buildings	Specificities of building (easy to clean, material used, etc.) + reduced risks of contamination (maintenance plan, frequent disinfection, etc.)
	Safety rules on grain	Mandatory controls on grain (ergot, germs, etc.)
	Safety rules on flour	Frequent analysis, hygiene plan, etc.
Traditional bakeries	Legal frame for traditional bakery designation	Bread should be produced and baked on-site to benefit from the designation
	Mandatory qualifications	Bakers must have a baker diploma (not needed for cooking terminals)
	Safety rules on food	regulation on hygiene practices in bakery
	Safety rules on public reception	regulation related to the reception of public in places where food is sold
Industrial bakeries	Safety rules on industrial production	HACCP procedures, maintenance plan, etc.
	Public procurement	specifications concerning bread supply by local authorities (local, organic, etc.)
Industrial & traditional bakeries	Regulation on predatory pricing	Regulation to avoid prices under production costs
	Urban planning	Affecting the possibilities of implantation, parking, etc.
	Laws on weekly rest	Regulation on the weekly work of bakers
All links or several links concerned	Trade policies (all actors)	Affects the price regulation, competition on wheat, flour or imported bakery, etc.
	Interbranch organisation (production and storage actors)	allows under certain conditions a dialogue between actors in the supply chain on certain topics, the promotion of best practices and some market transparency
	Competition policy: joint sales and agreements (production and storage actors)	"joint sales and agreements on quantities are allowed provided that 1-producers integrate in producer organisations, 2-these producer organisations carry out activities other than joint-selling that creates efficiencies (such as joint procurement, joint distribution, joint storage, etc.) and 3-the sales of the producer organisations do not exceed the threshold of 15% of the national production for arable crops" (DG trade)
	Mediation on contracts	Possibilities to invoke a ministry mediator for contentious commercial contracts

9.5.3.2 Trade policies, regulation and price volatility

In 1992, the confrontation of French and European production with the world market does not generate significant impacts in terms of price volatility for two reasons: on the one hand because the world price itself is not very volatile at this period and on the

other hand because the intervention price is established around the world price at that time, so that this form of intervention still plays a regulatory role. In the phase that begins in the 2000s, when the world price is on average higher, the intervention no longer plays any regulatory role (since the intervention price is systematically below the market price - even if the price of wheat continues its downward trend if we convert it into constant euros) and global volatility explodes, so that European volatility is also considerably stronger, Figure 9-0-8 (Ferenczi, 2014).

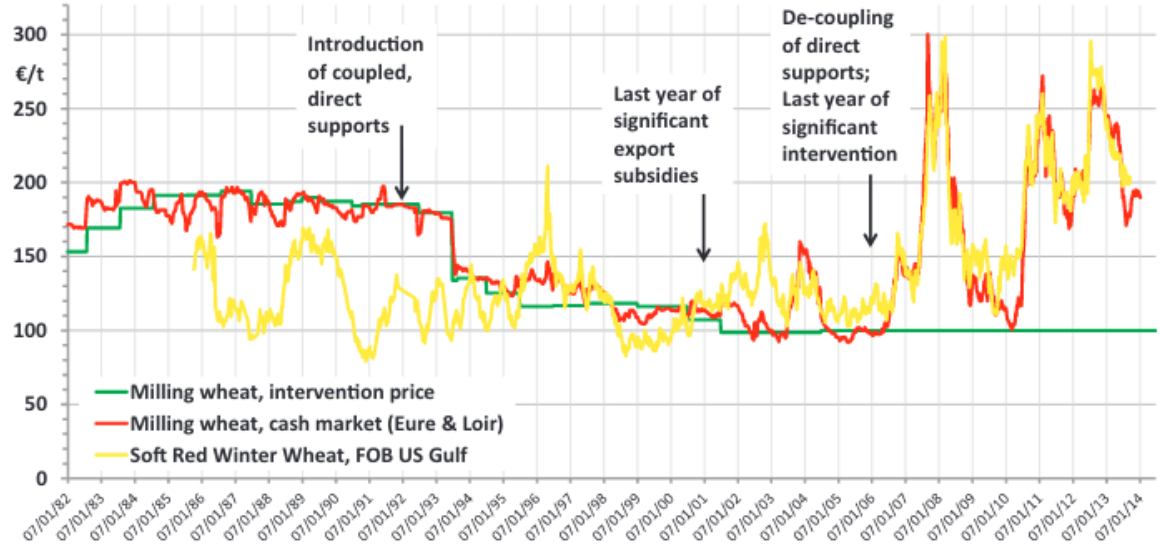


Figure 9-0-8 - Evolution of the wheat prices under the different regulatory regimes. Source: AGPB (Ferenczi, 2014)

Two categories of wheat can enter the European market: on the one hand a wheat subject to the very important fixed tariff, around 100 euros per ton, playing the role of quasi-closed markets, on the other hand the production, resulting from certain political negotiations, certain countries are subject to quotas and low or zero customs duties on production (the United States, Canada, Ukraine or Moldova for example). Regarding the organisation of trade policies at a more general level: the European ambition consisted in saying that the heart of the risks, in terms of competitiveness, were rather represented by feed wheat, that the European producers had an interest to maintain as a potential outlet, especially when their wheat did not fully meet the requirements of the international market of milling wheat. Europe is almost absent from the global maize market, which is therefore not considered to be a structural issue (there is even an interest in importing it at a low cost, such as soybeans). Tariffs on this commodity are therefore very low. Concerning milling wheat, the competition represented by the United States or Canada was not completely seized as a potential risk to the extent that the quality these regions provide do not fully meet the expectations of the French sector. Today, the situation of competition with the countries of the Black Sea tends to really change the context of competition and the organization of the sectors: the competition is frontal on all the European export markets (in terms of quality, price or logistics) while European production stagnates while the world demand is increasing. French and European exports are thus on a slope where they tend to become marginal, in relative share, compared to the global production traded on the markets. These important changes in the competitive situation involve:

1) a potential differentiation towards European markets which would valorise wheat production better, which however remain to be invented since this differentiation, with the exception of organic production, do not fully exist for the moment;

2) to change the current situation in which the income of farmers tends to decrease or even to be negative (including aids) some difficult years, which can lead to significant restructuring of farms, under relatively difficult investment conditions insofar as the price of land tends to increase and no longer reflects the potential profitability of the production. During the years where the income of producers is null or negative: producers no longer have the possibility of putting resources aside, and have therefore difficulties to invest.

In these conditions of production and integration on the international markets, at a time of strong loss of competitiveness in these markets, laws on fair commercial practices would only change the situation very marginally, as the world price is much more structuring than the prices charged between actors along the chain.

These are the reflexions of an actor concerning the current reflections on a legislative framework around unfair commercial practices:

> *"In the sectors where the prices are not global, these are very relevant topics. It is like the EGA law in France, it is very relevant on for many sectors that are not global, but on our side, it has no effect... what do you want us to do? It's not the law that will do anything about the world price so we're only talking about the premium and not the world price. This premium yes, we can talk about it, but it is not covered at all by regulatory initiatives." (chief economist of the wheat producers organisation)*
>
> (...)
>
> *"There are probably three levers: the price, the yields and the costs, they are linked of course, but if we do not manage in one way or another to solve or unlock these three dimensions, French wheat production might die, and even the European one, or it'll be residual, and we're not just speaking about grain farming there. If we look at it on the very long term, it may no longer be an economic sector strictly speaking, but rather a social sector or a residual sector or something that will be a kind of source of costs for society but that will keep on maintaining the landscape and provide environmental benefits." (chief economist of the wheat producers organisation).*

9.6 LINKS BETWEEN GOVERNANCE AND KEY ISSUES: FAIRNESS, INTEGRITY AND ENVIRONMENTAL SUSTAINABILITY

9.6.1 FAIRNESS ALONG THE CHAIN

Today, 100 euros made in the bakery industry, 5 euros return to production. Regarding net margins: they are rather weak at all links of the chain, except for bakery. There is some room for maneuver on the downstream price, but very little on the upstream price, which remains structurally determined by the world price, to which are added the premiums for contract productions, which still remain a small part of production.

If we take the example of the CRC (controlled sustainable farming) production: its valorisation is globally satisfactory, in the sense that the proposed premium largely covers the extra expenses related to this production at all links of the chain, but it represents only 2% of the French collection for the moment (still corresponding to 17% of the intra-French milling industry). On this CRC premium paid on the sale of grain: about two thirds go to the storage organisations to cover the costs of sorting, allotment and traceability that requires the label and the other third to the producer.

The Agri-Ethics label, an arrangement that is even more marginal in terms of volume, offers a 3-year visibility on prices, an opportunity which is very rarely proposed in the cereals sector. While the proposal may seem interesting in a period of significant price fluctuation, it happens that the label manages to get commitments from producers when the market prices are decreasing but it has strong difficulties involving farmers when the market is rising. Moreover, besides the fact that such an arrangement concerns low volumes, this potentiality of giving visibility to the sector is only possible in the traditional bakery sector, because the competition is such in the other sectors (industry or export in particular) that the actors are obliged to make shorter contracts to adapt to the permanent arbitrations to be made on purchases of raw materials.

If the value added at the bakery level is important, it is partly because the sector is needing a lot of manpower. Moreover, even if this added value is sometimes at the heart of the debates, it is not intended to be passed on to the other links of the chain, as the individual actors do not manage their activity through the added value produced, but through the profits. In addition, at the level of industrial bakers, each actor will seek to minimize the costs of flour purchases in order to make more profits than the competing actors (and stay in the economic circuit, which usually requires making the necessary investments to increase the material productivity of work within production units).

9.6.2 INFLUENCE OF THE SEGMENTATION ON THE BREAD CHAIN ORGANISATION

The CRC label, in some discussions within the sector or for some cooperatives, tends to become a horizon to reach, involving strong restructuring of the wheat to bread chain and the milling industry (with potential strong increase in terms of outlets). Indeed, during the EGA consultation, the wheat sector is committed to tipping most of its production into pesticide-free storage, an initiative that CRC label would help valorising. Even if the apprehensions of actors are the same as the concerns expressed around organic farming, that is to say: will the premium of the CRC be maintained if the CRC becomes a quasi-standard of production?

Switching to pesticide-free storage involves either cooling or heating the silos under highly controlled conditions. For the moment, the majority of storage facilities are not equipped to respond to these implementations, especially since the explosion-proof vents that have become mandatory in silos make it technically difficult to adapt silos to this new kind of storage. Today, smaller collection units would be needed to manage the segmentation, but investments were made in relation to a certain market state where there was no strong discrimination among production, and concrete silos, which can last 30 years, are set up in the frame long investment cycles.

Moreover, the fact that the CRC is not potentially valorised through export (export markets being globally focused on purely industrial criteria, and not looking for pesticide-free production for the moment) makes it difficult to manage investments. When wheat is sowed, and even when it is collected, it is generally not yet known where the production will be delivered. However, production without insecticide involves particularly clean batches, which may be in line with the requirements of export specifications (a criterion on which production from France is currently not as competitive as some other productions).

The involvement in the CRC sector will also potentially lead to strengthening the contractual framework and traceability mechanisms at all levels of the chain: between producers and collectors, between collectors and millers, between millers and their

various customers. The inter-branch organisation is in the process of determining, with actors of the CRC chain, how it would be possible to set up, on the basis of a blockchain type technology, an agricultural traceability deployed on the CRC chain but which might be used beyond the sole CRC label.

The current traceability system remains a statutory traceability, limited to the obligation that each actor circumscribes the actions carried out on each batch, without necessarily communicating with the next link of the chain. This allows to set up all the data records that make it possible, if a sanitary problem arise, to withdraw slots. The traceability that would rely on blockchain would go far beyond and does not meet a legal regulatory expectation, but is rather answering a logic of segmentation, aiming to promote the fact that information is passed on at every link in the chain, up to the final consumer.

Concerning the question of the promotion of the origin of production, which could potentially allow a better valorisation of the production, the possibility remains however structurally limited: on the one hand, certain regions are structurally better positioned for the export (like the Normandie region) and are therefore less inclined to focus on such an approach, on the other hand, the producers and their cooperatives are not able to dedicate the entire production to a given region. If we take the example of Ile de France, it is not possible (for questions of volumes needed and arbitrage of sales during the year) to provide the 15 million inhabitants of Ile-de-France with grain production that only comes from Île de France.

9.6.3 ENVIRONMENTAL SUSTAINABILITY

9.6.3.1 Segmentation and environmental sustainability

Presently, either the CRC or the red label are still very much focusing on industrial quality and consumer safety. Only the specifications of organic farming induce significant changes in production systems *per se*, implying the end of the use of pesticides and important rotations with legume crops in particular.

Some cooperatives, like Axereal in particular, try to introduce endogenous specifications concerning the transformation of production systems through their "cultivup" approach (Axereal, 2018). This approach is, however, both less ambitious than organic farming and still difficult to valorise on the market.
The specifications focusing on the limitation of residues pose two major problems from the point of view of the environmental sustainability: on the one hand, because they induce a small overhaul of the production systems, they do not represent an answer to soil and biodiversity issues (loss of biodiversity through the use of plant protection products).

It would seem, however, that the generalization of a "no-residue" approach is the preferred pathway for milling and cooperatives at present, as illustrated by the value chain plans presented to the government during the EGA consultation.

The question of segmentation can also be grasped by several prisms: does it have the role of "creating" value? As the premium sometimes only covers the investments needed for this segmentation. Does this segmentation only create a temporary additional value? The time needed for all actors to align with the innovation. Or does segmentation rather have a protective role for the internal market? Creating a differentiation (or a new domestic standard) that allows a form of protection against external imports, with all the limits that this strategy represents as the induced

investments bring a valorisation only on the domestic market whereas the domestic market represents the smallest share of the milling wheat market (compared with export).

9.6.3.2 The case of organic farming

However, organic farming tends to increase, both in terms of market share and conversions of producers (despite a much larger share of imports than for conventional wheat). This acceleration of production even tends, according to the actors, to develop with such speed that it could weaken the outlets, as it might bring some logistics difficulties. There are existing crushing capacities, as some large organic mills are still in a situation of under-capacity, but the weak link remains the logistics: the consolidation and massification of the organic offer as well as the homogenisation of organic lots. For this reason, importation tends to bypass this organisation, as it can offer large volumes of organic wheat at very competitive prices. This issue brings the actors of the sector to think about strengthening the notion of local organic production, which could help maintaining the price differential between organic wheat and conventional wheat in France. However, the current high level of organic imports may paradoxically create a reluctance on the part of processors to associate the entire organic production with a local source.

From a logistical point of view, cross-contamination risks between productions are also more important in organic farming than in conventional farming. In addition, the greater number of managed varieties implies higher logistical costs (smaller storage, etc.), that can partially reduce the additional margins that organic production allows. The market prices are however substantially covering these additional costs at the moment.

For some actors, the low level of conversion (compared to the market potential) is only marginally due to socio-technical lock-ins that would hinder the implications of producers in organic farming, but rather on the "opportunity costs" of conversions: the level of production that is potentially "lost" through organic conversion compared to conventional farming is less strong in some less productive areas, where producers are more willing to convert, than in Ile-de-France for example, where the potential yields are still very high. This leads to the fact that producers on the Atlantic seaboard or in the "intermediate areas" (which are less productive) are more willing to convert to organic farming. For example, organic cereal represents approximately 15% in the Drôme department (a less productive area) against 1% in Eure et Loire (a very productive area).

Moreover, in organic farming systems, 20% of the surfaces are sowed with wheat within the rotations (against 40 to 50% in conventional), so that it is necessary to valorise the remaining 80% of the production. This valorisation is only conceivable as long as the parallel demand for animal feed increases (knowing that feed manufacturers also import one third of the raw material, represented by about 20% of cereals and about 60% of soya and other protein-rich commodities).

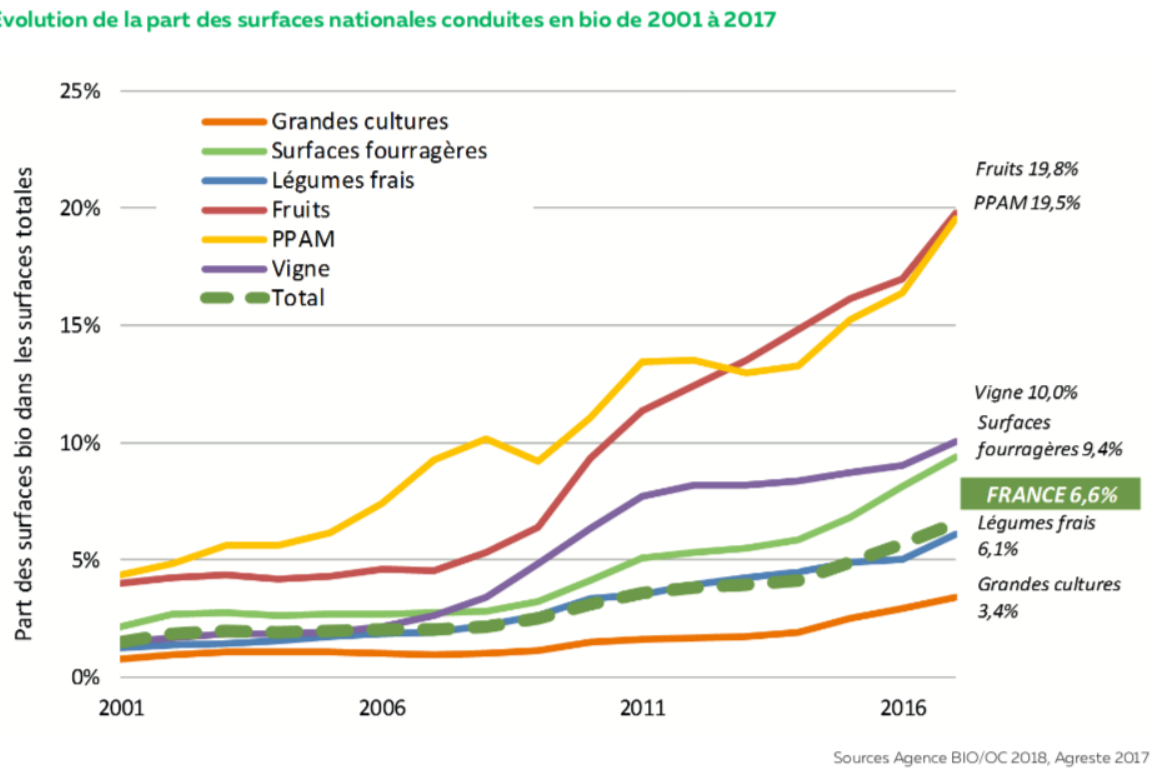


Figure 9-0-9 - Evolution of the share of the cultivated areas in organic farming per crops from 2001 to 2017 in France (field crops in orange) (Source: Agence Bio, 2018)

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ANNEX CHAPTER 9 : LIST OF STAKEHOLDERS INTERVIEWED

Structure	Function
Association Générale des producteurs de Blé (AGPB) - Association of wheat producers	Members of the economics department
Axereal, cooperative specialised in wheat value chains	Mission Head of Corporate Social Responsability
Axereal, cooperative specialised in wheat value chains	Task officer for national milling markets
Axereal, cooperative specialised in wheat value chains	Mission head of organic wheat value chains
Association Nationale des Meuniers de France (ANMF) - French National Association of Millers	Head of the association
Coop de France - National association of the French cooperatives	Task officer on grain production
FranceAgrimer - The national organisation responsible for agricultural sectors public policies	Task officer at the cereals department
France Export Céréales - The national association of cereals export	Head of the organisation
Centres d'économie rurale (CER France) - Network of accountants specialised in rural economy	Head of a regional organisation
Fédération des entreprises de Boulangerie (FEB) - National Federation of Bakery Industries	National Secretary