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Knowledge gaps in pork production with entire males and immunocastrates

This report represents Deliverable #1 of the action and was written under the direction of Ulrike Weiler and Michel Bonneau, the chair and vice-chair, respectively, of the COST Action CA 15215 with acronym IPEMA

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Please refer to this work as:
Weiler U., Larzul C., Bee G., von Borell E., Font-i-Furnols M., Škrlep M., Aluwé M., Doran O., Čandek-Potokar M., Hoelzle K., Bonneau M., 2018. Knowledge gaps in pork production with entire males and immunocastrates. Deliverable 1 of Cost Action 15215 IPEMA, Innovative Approaches for Pork Production with Entire Males. www.ca-ipema.eu
doi 10.5281/zenodo.1261981

Deliverable #1:
Knowledge gaps in pork production with entire males and immunocastrates

Method: To identify knowledge gaps, information about current research projects in the IPEMA countries was collected using a questionnaire designed at the first MC meeting and updated during the 2nd MC meeting. A criterion for inclusion of projects was that they should have been active during the life-time of the IPEMA action (2016-2020). The projects could be funded by national or international funding bodies and the industry. The Working Group (WG) specific knowledge gaps are summarized below.

Knowledge gaps in the field of WG1:

One of the key knowledge gaps in the area of WG1 is that there are still no reliable markers for genetic selection of pigs with reduced boar taint compounds without unfavourable impact on other commercially important reproductive traits. The main issue for androstenone is how to disentangle androstenone synthesis from the gonadal hormone axis. For skatole level, it has been demonstrated in the literature and in the on-going research projects that metabolism of skatole in pig liver via the cytochrome P450 system (CYP450) is breed specific. In general, the mechanisms and gene regulations underlying androstenone and skatole metabolism, the interferences between the two compounds and the breed-specificities of these regulations are far from clear. Bridging this knowledge gap would be important for understanding the variability of results and providing reliable. It would also provide valuable information for understudied breeds, such as local breeds, with unknown boar taint risk.

Interactions between dietary compounds and genotype are known to play an important role in the development of boar taint. The mechanisms regulating these interactions, which also involve the gut microbiota, are not fully understood. This knowledge gap should be addressed in collaboration between WG1 and WG2. Genetic improvement of animal welfare for entire males by reducing specific aggressive behaviour is still challenging. There is an important lack of information for genetic markers related to male behaviour. This topic should be studied together with WG3.

Four projects were reported to focus on either the genetic background of boar taint, the genetic relationships between boar taint risk and traits of interest, variability and reliability of genetic markers as well as evaluating the suitability of genotype for pork production with EM or IC, including in alternative breeding systems. It should be noted that some projects/activities, directly funded by pig industry or commercial pig breeding organizations, do not appear in the survey, as these breeding organizations are cautious and provide few details on their R&D projects.

The list of projects pertaining to WG1 is provided in Appendix 1.

Knowledge gaps in the field of WG2:

Analysis of the data of the literature and results of existing projects demonstrated that substantial new knowledge has been generated in the area related to the WG2. However, there is still a critical knowledge gap regarding the economic advantages of using specific nutrients schemes and boar taint reducing ingredients in the production of IC and EM. Addressing this knowledge gap is important for ensuring that there is an appropriate distinction between the pay for tainted carcasses and high quality ones.

One of the specific knowledge gaps is the lack of exact feeding requirements to meet the needs for an efficient growth of EM and IC during the fattening period and at the same time ensure high carcass and meat quality. Furthermore, the effective application of feed

additives which consistently minimize boar taint compounds in carcasses of EM warrants further research. This needs to cover topics like an in-depth understanding of their mode of action as well as their interaction with other feed ingredients used in grower finisher diets

Currently nine projects focus on the reduction of boar taint compounds in carcasses by the addition of specific feed ingredients to standard diets or by optimizing the nutrient composition of the diets according to specific needs of EM and IC. In three additional projects also the environmental consequences of feeding strategies and the use of immunocastration or different genders for pork production are considered.

The list of projects pertaining to WG2 is provided in Appendix 2.

Knowledge gaps in the field of WG3:

The optimization of management of EM and IC has gained considerable interest in the last decade and a number of factors which can reduce the welfare problems related to the production of EM have been identified. This has resulted in extensive investment in projects (currently 15 have been identified) aiming to address optimization of management and welfare aspects. This, in particular, includes a number of new male pigs-related welfare problems which have been identified during the last years (e.g. damaging behaviour) and which will be addressed in a number of active projects.

Another important knowledge gap pertains to the absence of a clear guideline for the best practice to avoid welfare problems in EM pork production systems. This gap has been to some extent addressed in the project focusing on early warning symptoms and the objective assessment of aggressive behaviour. Although male-specific welfare problems are reduced after IC, the effect of IC severely depends on the timing of the second vaccination, the genotype and the production system.

Knowledge gaps on the management and behaviours specific to entire males can be summarized as follows:

- Ontogeny of behaviour and early predictors for later problems (e.g. aggression and damaging behaviour)
- Genetic influence on behaviour (see WG 1 above)
- Fibrous diets and effects on behaviour and temperament
- Management of groups (e.g. stable groups from birth to stunning), group size and stability, space and pen enrichment
- Housing system and cleanliness of pigs
- Transport and pre-slaughter handling of EM
- Hormonal status and sexual maturation
- Influence of the quantity and quality of light
- Stress, housing conditions and efficiency of immunocastration

The list of projects pertaining to WG3 is provided in Appendix 3.

Knowledge gaps in the field of WG4:

The WG4 is focusing on the identification of rapid and sensitive methods (available and under development) for reliable on-line detection of boar taint compounds. In addition to boar taint, the detection of other pork quality traits such as the total fat and intramuscular fat content or fatty acid composition in EM have been gaining attention. If not addressed, the issue with other meat quality traits might limit the use of EM for meat products. Extensive

analysis of the literature demonstrated that there is a number of technologies and approaches used for evaluation of boar taint compounds and other meat quality traits some of them not ready to be used on line at that moment or with unknown knowledge of its accuracy. Publications in this area are limited due to the sensitive nature of the research (with the exception of a few patents). There seem to be two promising strategies, one from DK, the other from UK to measure boar taint compounds at the slaughter line. In addition, human nose scoring is used in slaughterhouses but still needs standardization. This is difficult due to the lack of standardized references for boar taint to train panellists that work in the slaughter plant and knowledge of the characteristics of the panel (i.e. number of panellists, performance of the panel) to carry out a reliable determination of boar taint. Furthermore, for boar taint purposes, technologies need to be compared to human nose and consumers to draw quality control conclusions. Thus, currently there is no reliable, quick and cost-effective online-method and there are still gaps to fill and aspects to improve to have a complete on-line integrative quality control system covering the requested meat quality grading parameters

The list of projects pertaining to WG4 is provided in Appendix 4.

Knowledge gaps in the field of WG5:

There are three general focuses in the WP5, characterization of meat quality of EM and IC, assessment of quality of products from EM and IC and valorisation of meat with boar taint. With regard to meat quality, published studies reveal lower IMF and tenderness in EM (via meta-analytical studies), whereas for other meat technological traits (pH, water holding capacity, colour) inconsistent results are reported. However, on the whole, inferior quality of meat from EM is clearly indicated. Moreover, there is a lack of information about the effect of lipid oxidation and proteolysis. Both processes may be accelerated in EM as a consequence of lower lipid saturation and (potentially) higher protein turnover, respectively. Although studies on the suitability of EM and IC for different meat products exist, the information available is fragmental and difficult to be summarized. The main reason is that the quality requirements for each specific meat product are region- and population-specific as there are regional/country- differences in the recipes for pork-based dished and in consumers' expectations. As to the valorisation of tainted pork from EM, many different approaches have been proposed of either masking (i.e. spices, smoke, marinades) or reducing (i.e. thermal treatment, dry-curing, diluting) boar taint. The approach to reduce boar taint compounds by processing has been studied to a lesser degree than the possibility of masking the unpleasant odour and taste. Here again, the information is fragmented to specific products, formulations, procedures and specific boar taint levels (skatole, androstenone or their combination), whereas the conclusion in regard to the effectiveness is still lacking (i.e. to what degree can a specific method reduce/mask a specific level of boar taint compounds).

Among the gathered information on the current projects, there were 22 projects listed that deal with the topics related to WP5. Out of them, there are 18 projects that include research in relation to meat/raw material quality traits, 8 of them include work on product quality and 8 of them focus on valorisation of meat/products with boar taint. It is also worth mentioning that 4 projects are primarily focused on product quality and processing. Majority of the projects are conducted and founded nationally (n=16), 4 were conducted internationally (one of them funded by the industry), while the remaining two were industry-funded national projects.

The list of projects pertaining to WG5 is provided in Appendix 5.

Knowledge gaps in the field of WG6:

The diversity of European consumers, both within and between countries makes an estimation of acceptance and adverse market reactions difficult. Only a little number of studies have been performed with the same approach in different countries. In addition only few studies have been focusing on the Eastern European markets. This is a substantial knowledge gap and developing of a standardized approach to comparison of consumers' attitudes is crucial. It is also important to have a joint and coordinated international approach to this issue to ensure successful outcomes. A number of collaborative active projects addressing the above aspects have been identified.

The other knowledge gap is a lack of agreed methodological approaches for assessment of consumers' acceptance of meat. The current methodological differences make a comparison between results of different studies extremely difficult or impossible. The most optimal approach would be to combine harmonised protocols for sensory as well market studies that evaluate the expectations of consumers, the attitudes and buying behaviour and the drives that determine these aspects. A better understanding of consumer sensory acceptance and attitudes towards the alternatives would help to set-up of information strategies and to improve stakeholder acceptance of the alternatives. Further effort should be done to which information is present and lacking in practice to set up specific information strategies on feeding, breeding, meat quality, attitudes and economic feasibility towards e.g. feeding companies, breeders, farmers, slaughterhouses, meat processors and retailers.

The list of projects pertaining to WG6 is provided in Appendix 6. Two out of the thirteen listed projects are/were performed internationally. Aim will be to perform the sensory and attitude study planned in the SUSI project as broad as possible in joint collaboration with the COST project to address the knowledge gap in the Eastern European market and to enable a better understanding of the link between attitudes and sensory acceptance.

Appendix 1: List of projects pertaining to Work group 1 - Genetics

Return to WG1

Name of the project	Use of alternatives in organic farming
Type of project	Literature and questionnaires
Funded by	National project
Start year	2018
Duration (month)	4
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	
Participating countries	National
Subtopic	
Genetic of boar taint	
Boar taint vs welfare/reproduction	
Breeding strategies	
Alternative breeding systems	X

Name of the project	Influence of terminal sire on carcass and meat quality traits of gilts and castrated, immunocastrated and entire male pigs
Type of project	Research
Funded by	Industry
Start year	2016
Duration (month)	12
Coordinator	Goran Kušec
Coordinator institution	Faculty of Agriculture in Osijek, Croatia
Other participant institutions	KIS (SI)
Participating countries	
Subtopic	
Genetic of boar taint	X
Boar taint vs welfare/reproduction	
Breeding strategies	
Alternative breeding systems	

Name of the project	Synergy for preventing damaging behaviour in group housed pigs and chickens (GroupHouseNet)
Type of project	Networking
Funded by	H2020
Start year	2016
Duration (month)	48
Coordinator	Prof. Andrew Janczak
Coordinator institution	Norwegian University of Life Sciences (NMBU, Norway)
Other participant institutions	USDA-ARS Livestock Behavior Research Unit
Participating countries	
Subtopic	
Genetic of boar taint	Yes
Boar taint vs welfare/reproduction	Yes

Breeding strategies	Yes
Alternative breeding systems	Yes

Name of the project	Identification of slaughter and farm related risk factors for boar taint
Type of project	Research
Funded by	National
Start year	2013
Duration (month)	48
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	Ugent, KULeuven
Participating countries	National
Subtopic	
Genetic of boar taint	
Boar taint vs welfare/reproduction	X
Breeding strategies	
Alternative breeding systems	

Name of the project	ACASOS
Type of project	Research
Funded by	INRA
Start year	2016
Duration (month)	24
Coordinator	A. Prunier
Coordinator institution	INRA
Other participant institutions	
Participating countries	National
Subtopic	
Genetic of boar taint	X
Boar taint vs welfare/reproduction	X
Breeding strategies	
Alternative breeding systems	

Name of the project	AROME
Type of project	Research
Funded by	National + industry
Start year	2016
Duration (month)	42
Coordinator	C. Larzul
Coordinator institution	INRA
Other participant institutions	IFIP, Bioporc
Participating countries	National
Subtopic	
Genetic of boar taint	X
Boar taint vs welfare/reproduction	X
Breeding strategies	
Alternative breeding systems	

Name of the project	UTOPIGE
Type of project	Research
Funded by	National + industry
Start year	2011
Duration (month)	60
Coordinator	P. Le Roy & C. Larzul
Coordinator institution	INRA
Other participant institutions	IFIP, Bioporc
Participating countries	National
Subtopic	
Genetic of boar taint	X
Boar taint vs welfare/reproduction	X
Breeding strategies	
Alternative breeding systems	

Name of the project	CASTRUM – Pig Castration for Traditional and Conventional Products: a Report on Methods and their Impacts on Animal Welfare, Meat Quality and Sustainability of European Pork Production Systems.
Type of project	Survey/report
Funded by	DG-SANTE
Start year	2016
Duration (month)	12
Coordinator	Luca Fontanesi
Coordinator institution	Department of Agricultural and Food Sciences, University of Bologna (Italy)
Other participant institutions	Martin-Luther-Universität Halle-Wittenberg, Institut de la Filière Porcine, Institute for Agricultural and Fisheries Research, Instituto de Recerca i Tecnologia Agroalimentàries, Norwegian Meat and Poultry Research Center, Kmetijski Institut Slovenije (Agricultural Institute of Slovenia), Swedish University of Agricultural Sciences, Instituto Nacional de Investigacao Agraria e Veterinaria, Council for Agricultural Research and Economics - CREA, Faculty of Agriculture in Osijek
Participating countries	Italy, Germany, France, Belgium, Spain, Norway, Slovenia, Sweden, Portugal, Croatia
Subtopic	
Genetic of boar taint	
Boar taint vs welfare/reproduction	
Breeding strategies	X
Alternative breeding systems	X

Name of the project	The elimination of the incidence of boar odor by genetic and nutritional measures. (In czech: Eliminace výskytu kančího pachu pomocí genetických a nutričních opatření.)
Type of project	Elimination of boar taint involves the optimization of fattening, the identification of mutations in genes associated with levels of androstenone, skatole and indole, recommendations for breeding and reproduction, verification perception and acceptability of different levels of incidence of boar taint in pork for consumers. Analysis: genotyping by PCR - RFLP; study of gene expression; Different feeding strategy; The determine levels of androstenone, skatole and indole by liquid chromatography; The evaluation parameters of carcass quality; sensory analysis;
Funded by	VES17COST INTER-EXCELLENCE INTER-COST
Start year	The project proposal - Results Grant of Competition -May 2017; ?Start project 1.6.2017
Duration (month)	31
Coordinator	doc. Ing. Roman Stupka, CSc.
Coordinator institution	Department of Animal Husbandary - Czech University of Life Science (CULS)

Other participant institutions	Universitaet Hohenheim; Ghent University; VÚŽV Nitra
Participating countries	Czech Republic; Germany; Belgium; Slovak Republic
Subtopic	
Genetic of boar taint	X
Boar taint vs welfare/reproduction	
Breeding strategies	x
Alternative breeding systems	

Name of the project	Association analysis of SNPs and gene expression of porcine CYP2E1, HSD3B1 a RDH16 with skatole, indole, and androstenone levels in backfat of a crossbred pig.
Type of project	The main objective of the project will characterize the relationship between the level of androstenone, indole and skatole in the fat tissue of pigs and the SNP to be detected in the above-described genes. And also between gene expression, the frequency of detected SNPs and levels of components of boar odor. Analysis: genotyping by PCR - RFLP; study of gene expression; The determine levels of androstenone, skatole and indole by liquid chromatography; The evaluation parameters of carcass quality
Funded by	CIGA 2017 (Grant Agency of the Czech University of Life Science)
Start year	2017
Duration (month)	24
Coordinator	Ing. Kateřina Zadinová
Coordinator institution	Department of Animal Husbandary - Czech University of Life Science (CULS)
Other participant institutions	Department of Quality of Agricultural Products (CULS) Department of Economics (CULS)
Participating countries	Czech Republic
Subtopic	
Genetic of boar taint	x
Boar taint vs welfare/reproduction	
Breeding strategies	x
Alternative breeding systems	

Name of the project	Subjective and objective assessment of aggressive behaviour on three pig farms
Type of project	Research
Funded by	government
Start year	2016
Duration (month)	
Coordinator	Gé Backus
Coordinator institution	Connecting Agri and Food
Other participant institutions	
Participating countries	national
Subtopic	
Genetic of boar taint	
Boar taint vs welfare/reproduction	x
Breeding strategies	
Alternative breeding systems	

Name of the project	"Implementation of new phenotypes in the breeding program"
Type of project	Industry project
Funded by	Industry contract
Start year	2015

Duration (month)	2017
Coordinator	Maren van Son
Coordinator institution	Norsvin SA
Other participant institutions	
Participating countries	Norway
Subtopic	
Genetic of boar taint	
Boar taint vs welfare/reproduction	x
Breeding strategies	
Alternative breeding systems	

Name of the project	BoarPPM - "Boars to the market – solutions for Production, Pork quality & Markers for boar taint"
Type of project	Research
Funded by	Norwegian Research Council
Start year	2016
Duration (month)	2019
Coordinator	Marianne Sundt Sødring
Coordinator institution	Animalia (Norwegian Meat and Poultry Research Center)
Other participant institutions	Norsvin SA (Norwegian Pig Breeders Association), Norwegian University of Life Sciences, Liverpool John Moores University, Nortura AS
Participating countries	Norway, UK
Subtopic	
Genetic of boar taint	x
Boar taint vs welfare/reproduction	x
Breeding strategies	x
Alternative breeding systems	

Name of the project	Influence of different time points of vaccination against boar taint on its efficacy and duration(hormonal status, the sexual behaviour) and their consequences for fattening performance, body composition and meat quality and boar taint in comparison to entire and surgical castrated males
Type of project	Research
Funded by	national
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Uni Hohenheim, LFVZ Schwarzenau, MRI Kulmbach
Participating countries	national
Subtopic	
Genetic of boar taint	
Boar taint vs welfare/reproduction	x
Breeding strategies	
Alternative breeding systems	

Appendix 2: List of projects pertaining to Work group 2 - Nutrition

Return to WG2

Name of the project	Use of alternatives in organic farming
Type of project	Literature and questionnaires
Funded by	National project
Start year	2018
Duration (month)	4
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
Feeding for performance	
Feeding to control boar taint	
Nutrition of IC	
Feed ingredients against boar taint	x

Name of the project	Innovative techniques for overcoming (mitigation) negative effects of climate changes in livestock and poultry industry
Type of project	Research
Funded by	National project
Start year	2017
Duration (month)	12
Coordinator	Prof. Dragoslav Kocevski
Coordinator institution	Faculty of agricultural science and food, University Ss Cyril and Methodius in Skopje, Republic of Macedonia
Other participant institutions	
Participating countries	
Subtopic	
Feeding for performance	Yes
Feeding to control boar taint	Yes
Nutrition of IC	Yes
Feed ingredients against boar taint	Yes

Name of the project	Identification of slaughter and farm related risk factors for boar taint
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	Ugent, KULeuven
Participating countries	national
Subtopic	
Feeding for performance	
Feeding to control boar taint	
Nutrition of IC	

Feed ingredients against boar taint	x

Name of the project	SUSI
Type of project	Research
Funded by	national/ERANET
Start year	2017
Duration (month)	36
Coordinator	Stefanski Volker
Coordinator institution	UHOH
Other participant institutions	ILVO,INRA,KIS,UL-VF,SEGES,WULS,WU
Participating countries	Germany, France, Slovenia, Belgium, Denmark, Poland, The Netherlands
Subtopic	
Feeding for performance	
Feeding to control boar taint	
Nutrition of IC	x
Feed ingredients against boar taints	

Name of the project	Use of bioactive compounds to control the extent of boar taint and ammonia emmission in entire male pigs
Type of project	Research
Funded by	Agroscope
Start year	2015
Duration (month)	36
Coordinator	G. Bee
Coordinator institution	Agroscope
Other participant institutions	University of Sassari
Participating countries	Italy
Subtopic	
Feeding for performance	x
Feeding to control boar taint	
Nutrition of IC	
Feed ingredients against boar taint	x

Name of the project	Dynamics of nutrient deposition in the empty body depending crude protein and amino acid supply in castrated, females and entire male pigs
Type of project	Research
Funded by	Agroscope
Start year	2013
Duration (month)	48
Coordinator	G. Bee
Coordinator institution	Agroscope
Other participant institutions	none
Participating countries	Switzerland
Subtopic	
Feeding for performance	X
Feeding to control boar taint	
Nutrition of IC	
Feed ingredients against	

boar taint

Name of the project	The elimination of the incidence of boar odor by genetic and nutritional measures. (In czech: Eliminace výskytu kančího pachu pomocí genetických a nutričních opatření.)
Type of project	Elimination of boar taint involves the optimization of fattening, the identification of mutations in genes associated with levels of androstenone, skatole and indole, recommendations for breeding and reproduction, verification perception and acceptability of different levels of incidence of boar taint in pork for consumers. Analysis: genotyping by PCR - RFLP; study of gene expression; Different feeding strategy; The determine levels of androstenone, skatole and indole by liquid chromatography; The evaluation parameters of carcass quality; sensory analysis;
Funded by	VES17COST INTER-EXCELLENCE INTER-COST
Start year	The project proposal - Results Grant of Competition -May 2017; ?Start project 1.6.2017
Duration (month)	31
Coordinator	doc. Ing. Roman Stupka, CSc.
Coordinator institution	Department of Animal Husbandary - Czech University of Life Science (CULS)
Other participant institutions	Universitaet Hohenheim; Ghent University; VÚŽV Nitra
Participating countries	Czech Republic; Germany; Belgium; Slovak Republic
Subtopic	
Feeding for performance	x
Feeding to control boar taint	x
Nutrition of IC	
Feed ingredients against boar taint	x

Name of the project	Influence of different time points of vaccination against boar taint on its efficacy and duration(hormonal status, the sexual behaviour) and their consequences for fattening performance, body composition and meat quality and boar taint in comparison to entire and surgical castrated males
Type of project	Research
Funded by	national
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Uni Hohenheim, LFVZ Schwarzenau, MRI Kulmbach
Participating countries	national
Subtopic	
Feeding for performance	
Feeding to control boar taint	x
Nutrition of IC	
Feed ingredients against boar taint	

Name of the project	Quality of boars, barrows and gilts
Type of project	Research
Funded by	government
Start year	2014-2016
Duration (month)	24
Coordinator	Gé Backus
Coordinator institution	Connecting Agri and Food
Other participant institutions	

Participating countries	national
Subtopic	
Feeding for performance	x
Feeding to control boar taint	
Nutrition of IC	
Feed ingredients against boar taint	x

Name of the project	Boar taint and Inuline
Type of project	Research
Funded by	50/50 industry local government
Start year	2016
Duration (month)	12
Coordinator	Angela van der Sanden
Coordinator institution	Connecting Agri and Food
Other participant institutions	
Participating countries	national
Subtopic	
Feeding for performance	x
Feeding to control boar taint	
Nutrition of IC	
Feed ingredients against boar taint	x

Name of the project	SuSI: Sustainability in pork production with immunocastration
Type of project	research
Funded by	H2020
Start year	2017
Duration (month)	3 years
Coordinator	Volker Stefanski
Coordinator institution	UHOH
Other participant institutions	KIS, UL-VF, INRA, ILVO, SEGES, WULS, WU
Participating countries	D, B, NL, F, DK, PL, SI
Subtopic	
Feeding for performance	
Feeding to control boar taint	
Nutrition of IC	x
Feed ingredients against boar taint	

Name of the project	Research program: Sustainable Agriculture
Type of project	research
Funded by	national
Start year	on-going (renewable; 2018)
Duration (month)	6 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	
Participating countries	
Subtopic	

Feeding for performance	x
Feeding to control boar taint	x
Nutrition of IC	x
Feed ingredients against boar taint	x

Name of the project	L4-5521: Raising entire males or immunocastration? Research of measures for boar taint reduction and emerging problems of product quality
Type of project	research
Funded by	national
Start year	2013-2016
Duration (month)	3 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	UL-VF, UL-BF, UM-FKBV
Participating countries	
Subtopic	
Feeding for performance	x
Feeding to control boar taint	x
Nutrition of IC	x
Feed ingredients against boar taint	x

Name of the project	Influence of vaccination against boar taint on sexual behaviour, penile injuries, body composition and boar taint
Type of project	Research
Funded by	industry
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Zoetis, MRI Kulmbach
Participating countries	national
Subtopic	
Feeding for performance	
Feeding to control boar taint	(X)
Nutrition of IC	
Feed ingredients against boar taint	

Name of the project	Adsorbing materials to reduce boar taint
Type of project	Research
Funded by	National
Start year	2014
Duration (month)	32
Coordinator	Nuria Canibe
Coordinator institution	Aarhus University, Denmark
Other participant institutions	Polyteknisk Forskning & Udvikling A/S
Participating countries	National
Subtopic	
Feeding for performance	

Feeding to control boar taint	
Nutrition of IC	
Feed ingredients against boar taint	X

Appendix 3: List of projects pertaining to Work group 3 – Management and Welfare

Return to WG3

Name of the project	Use of alternatives in organic farming
Type of project	Literature and questionnaires
Funded by	National project
Start year	2018
Duration (month)	4
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	x
Group, space, pen, enrichment	x
Transport & pre-slaughter	
Hormone, stress, health, immunity	

Name of the project	Innovative techniques for overcoming (mitigation) negative effects of climate changes in livestock and poultry industry
Type of project	Research
Funded by	National project
Start year	2017
Duration (month)	12
Coordinator	Prof. Dragoslav Kocevski
Coordinator institution	Faculty of agricultural science and food, University Ss Cyril and Methodius in Skopje, Republic of Macedonia
Other participant institutions	
Participating countries	
Subtopic	
Behaviour EM & sexual maturation	Yes
Group, space, pen, enrichment	Yes
Transport & pre-slaughter	Yes
Hormone, stress, health, immunity	Yes

Name of the project	Synergy for preventing damaging behaviour in group housed pigs and chickens (GroupHouseNet)
Type of project	Networking
Funded by	H2020
Start year	2016
Duration (month)	48
Coordinator	Prof. Andrew Janczak
Coordinator institution	Norwegian University of Life Sciences (NMBU, Norway)
Other participant institutions	USDA-ARS Livestock Behavior Research Unit
Participating countries	
Subtopic	

Behaviour EM & sexual maturation	Yes
Group, space, pen, enrichment	Yes
Transport & pre-slaughter	Yes
Hormone, stress, health, immunity	Yes

Name of the project	IOF2020
Type of project	
Funded by	H2020
Start year	2017
Duration (month)	48
Coordinator	
Coordinator institution	Wageningen UR
Other participant institutions	ILVO,.....
Participating countries	73 partners, from 16 countries, under the coordination of Wageningen University & Research
Subtopic	
Behaviour EM & sexual maturation	
Group, space, pen, enrichment	x
Transport & pre-slaughter	x
Hormone, stress, health, immunity	

Name of the project	Optimal slaughter weight
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Sam Millet
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	x

Name of the project	Identification of slaughter and farm related risk factors for boar taint
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	Ugent, KULeuven

Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	
Group, space, pen, enrichment	
Transport & pre-slaughter	x
Hormone, stress, health, immunity	

Name of the project	AROME
Type of project	Research
Funded by	National + industry
Start year	2016
Duration (month)	42
Coordinator	C. Larzul
Coordinator institution	INRA
Other participant institutions	IFIP, Bioporc
Participating countries	National
Subtopic	
Behaviour EM & sexual maturation	
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	x

Name of the project	CASTRUM – Pig Castration for Traditional and Conventional Products: a Report on Methods and their Impacts on Animal Welfare, Meat Quality and Sustainability of European Pork Production Systems.
Type of project	Survey/report
Funded by	DG-SANTE
Start year	2016
Duration (month)	12
Coordinator	Luca Fontanesi
Coordinator institution	Department of Agricultural and Food Sciences, University of Bologna (Italy)
Other participant institutions	Martin-Luther-Universität Halle-Wittenberg, Institut de la Filière Porcine, Institute for Agricultural and Fisheries Research, Instituto de Recerca i Tecnologia Agroalimentàries, Norwegian Meat and Poultry Research Center, Kmetijski Institut Slovenije (Agricultural Institute of Slovenia), Swedish University of Agricultural Sciences, Instituto Nacional de Investigacao Agraria e Veterinaria, Council for Agricultural Research and Economics - CREA, Faculty of Agriculture in Osijek
Participating countries	Italy, Germany, France, Belgium, Spain, Norway, Slovenia, Sweden, Portugal, Croatia
Subtopic	
Behaviour EM & sexual maturation	x
Group, space, pen, enrichment	x
Transport & pre-slaughter	x
Hormone, stress, health, immunity	x

Name of the project	Subjective and objective assessment of aggressive behaviour on three pig farms
Type of project	Research

Funded by	government
Start year	2016
Duration (month)	
Coordinator	Gé Backus
Coordinator institution	Connecting Agri and Food
Other participant institutions	
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	x
Group, space, pen, enrichment	x
Transport & pre-slaughter	
Hormone, stress, health, immunity	

Name of the project	Boar taint and Inuline
Type of project	Research
Funded by	50/50 industry local government
Start year	2016
Duration (month)	12
Coordinator	Angela van der Sanden
Coordinator institution	Connecting Agri and Food
Other participant institutions	
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	x
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	

Name of the project	SuSI: Sustainability in pork production with immunocastration
Type of project	research
Funded by	H2020
Start year	2017
Duration (month)	3 years
Coordinator	Volker Stefanski
Coordinator institution	UHOH
Other participant institutions	KIS, UL-VF, INRA, ILVO, SEGES, WULS, WU
Participating countries	D, B, NL, F, DK, PL, SI
Subtopic	
Behaviour EM & sexual maturation	x
Group, space, pen, enrichment	x
Transport & pre-slaughter	
Hormone, stress, health, immunity	x

Name of the project	Research program: Sustainable Agriculture

Type of project	research
Funded by	national
Start year	on-going (renewable; 2018)
Duration (month)	6 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	
Participating countries	
Subtopic	
Behaviour EM & sexual maturation	
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	x

Name of the project	L4-5521: Raising entire males or immunocastration? Research of measures for boar taint reduction and emerging problems of product quality
Type of project	research
Funded by	national
Start year	2013-2016
Duration (month)	3 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	UL-VF, UL-BF, UM-FKBV
Participating countries	
Subtopic	
Behaviour EM & sexual maturation	
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	x

Name of the project	Appearance of Penile Injuries after Immunocastration depending on slaughter age in one fattening unit
Type of project	
Funded by	industry
Start year	2016
Duration (month)	6
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Zoetis, Tönnies
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	x (only IC)
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	

Name of the project	Influence of vaccination against boar taint on sexual behaviour, penile injuries, body composition and boar taint
Type of project	Research
Funded by	industry
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Zoetis, MRI Kulmbach
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	x (IC & Entire males)
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	

Name of the project	Influence of different time points of vaccination against boar taint on its efficacy and duration(hormonal status, the sexual behaviour) and their consequences for fattening performance, body composition and meat quality and boar taint in comparison to entire and surgical castrated males
Type of project	Research
Funded by	national
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Uni Hohenheim, LFVZ Schwarzenau, MRI Kulmbach
Participating countries	national
Subtopic	
Behaviour EM & sexual maturation	x
Group, space, pen, enrichment	
Transport & pre-slaughter	
Hormone, stress, health, immunity	x

Appendix 4: List of projects pertaining to Work group 4 – Meat Quality

Return to WG4

Name of the project	Optimal slaughter weight
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Sam Millet
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	
human nose	
on line meat quality	x

Name of the project	Improvement of pork quality in Flanders
Type of project	Research
Funded by	national
Start year	2016
Duration (month)	48
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	UGent
Participating countries	National
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	x
human nose	
on line meat quality	x

Name of the project	At line detection methods for boar taint
Type of project	Research
Funded by	national
Start year	2014
Duration (month)	48
Coordinator	Lynn Vanhaecke
Coordinator institution	UGent
Other participant institutions	
Participating countries	national
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	

human nose	
on line meat quality	x

Name of the project	Identification of slaughter and farm related risk factors for boar taint
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	Ugent, KULeuven
Participating countries	national
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	
human nose	x
on line meat quality	

Name of the project	SUSI
Type of project	Research
Funded by	national/ERANET
Start year	2017
Duration (month)	36
Coordinator	Stefanski Volker
Coordinator institution	UHOH
Other participant institutions	ILVO,INRA,KIS,UL-VF,SEGES,WULS,WU
Participating countries	Germany, France, Slovenia, Belgium, Denmark, Poland, The Netherlands
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	
human nose	x
on line meat quality	x

Name of the project	
Type of project	
Funded by	National INIA funding
Start year	2018
Duration (month)	2021
Coordinator	N. Panella-Riera/A. Oliver
Coordinator institution	IRTA
Other participant institutions	Murcia University
Participating countries	Spain
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	

human nose	x
on line meat quality	x (and/ska raman)

Name of the project	Development of Human nose methodology with two slaughter houses
Type of project	
Funded by	Regional EU funding and private companies
Start year	2017
Duration (month)	One year
Coordinator	N. Panella-Riera/A. Oliver
Coordinator institution	INNOVAC
Other participant institutions	Four private Companies
Participating countries	National
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	
human nose	x
on line meat quality	

Name of the project	Use of bioactive compounds to control the extent of boar taint and ammonia emission in entire male pigs
Type of project	Reserach
Funded by	Agrosocpe
Start year	2015
Duration (month)	36
Coordinator	G. Bee
Coordinator institution	Agroscope
Other participant institutions	University of Sassari
Participating countries	Italy
Subtopic	
lab analytical for boar taint	x
on line chemical boar taint	
on line sensors	
human nose	
on line meat quality	

Name of the project	Dynamics of nutrient deposition in the empty body depending crude protein and amino acid supply in castrated, females and entire male pigs
Type of project	Research
Funded by	Agroscope
Start year	2013
Duration (month)	48
Coordinator	G. Bee
Coordinator institution	Agroscope
Other participant institutions	none
Participating countries	Switzerland
Subtopic	
lab analytical for boar taint	x
on line chemical boar taint	

on line sensors	
human nose	
on line meat quality	

Name of the project	Multidisciplinary training in the development of novel technology (bio-sensors) for boar taint detection to assist with production of taint-free pork
Type of project	Research AND Training
Funded by	UK Agriculture and Horticulture Development Board
Start year	2014
Duration (month)	36
Coordinator	Prof. Olena Doran/Prof John Hart
Coordinator institution	University of the West of England, UWE
Other participant institutions	UK industry as project partners
Participating countries	National
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	x
human nose	
on line meat quality	x boar taint

Name of the project	Development of (bio)sensors for detection of fatty acid composition in meat and meat products from pig and cattle
Type of project	Research AND Training
Funded by	UK Agriculture and Horticulture Development Board
Start year	2017
Duration (month)	36
Coordinator	Prof. Olena Doran/Prof John Hart
Coordinator institution	University of the West of England, UWE
Other participant institutions	UK industry as project partners
Participating countries	National
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	x
human nose	
on line meat quality	x fatty acids

Name of the project	Novel technology (bio-sensors) for on-line detection of boar taint compounds
Type of project	Research
Funded by	UK Research Council BBSRC
Start year	2016
Duration (month)	14
Coordinator	Prof. Olena Doran/Prof John Hart
Coordinator institution	University of the West of England, UWE
Other participant institutions	UK industry as project partners
Participating countries	National
Subtopic	
lab analytical for boar taint	

on line chemical boar taint	x
on line sensors	x
human nose	
on line meat quality	

Name of the project	Boars to the market - solutions for Production, Pork quality & Markers for boar taint
Type of project	Research
Funded by	BIONÆR
Start year	2016
Duration (month)	36 months
Coordinator	Marianne Sundt Sødring
Coordinator institution	Animalia
Other participant institutions	NMBU, Nortura, Norsvin
Participating countries	Norway
Subtopic	
lab analytical for boar taint	X
on line chemical boar taint	X
on line sensors	X
human nose	X
on line meat quality	X

Name of the project	"Implementation of new phenotypes in the breeding program"
Type of project	Industry project
Funded by	Industry contract
Start year	2015
Duration (month)	2017
Coordinator	Maren van Son
Coordinator institution	Norsvin SA
Other participant institutions	
Participating countries	Norway
Subtopic	
lab analytical for boar taint	
on line chemical boar taint	
on line sensors	
human nose	x
on line meat quality	

Name of the project	BoarPPM - “Boars to the market – solutions for Production, Pork quality & Markers for boar taint”
Type of project	Research
Funded by	Norwegian Research Council
Start year	2016
Duration (month)	2019
Coordinator	Marianne Sundt Sødring
Coordinator institution	Animalia (Norwegian Meat and Poultry Research Center)
Other participant institutions	Norsvin SA (Norwegian Pig Breeders Association), Norwegian University of Life Sciences, Liverpool John Moores University, Nortura AS
Participating countries	Norway, UK
Subtopic	

lab analytical for boar taint	
on line chemical boar taint	x
on line sensors	
human nose	x
on line meat quality	

Appendix 5: List of projects pertaining to Work group 5 - Processing

Return to WG5

Name of the project	Influence of terminal sire on carcass and meat quality traits of gilts and castrated, immunocastrated and entire male pigs
Type of project	Research
Funded by	industry
Start year	2016
Duration (month)	12
Coordinator	Goran Kušec
Coordinator institution	Faculty of Agriculture in Osijek, Croatia
Other participant institutions	KIS (SI)
Participating countries	
Subtopic	
quality of raw material	Carcass composition and meat quality traits
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Impact of different method of castration on performance and carcass quality of pigs
Type of project	Research
Funded by	
Start year	2017
Duration (month)	2017
Coordinator	12
Coordinator institution	Povod M.
Other participant institutions	Sumy state agrarian university
Participating countries	National University of life and environmental scineces of Ukraine, Poltava state agrarian academy
Subtopic	
quality of raw material	
meat products: physico-chemical traits	x
meat products: boar taint	

Name of the project	Optimal slaughter weight
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Sam Millet
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Improvement of pork quality in Flanders
Type of project	Research
Funded by	national
Start year	2016
Duration (month)	48
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	UGent
Participating countries	National
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	At line detection methods for boar taint
Type of project	Research
Funded by	national
Start year	2014
Duration (month)	48
Coordinator	Lynn Vanhaecke
Coordinator institution	UGent
Other participant institutions	
Participating countries	national
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Reduction of boar taint in meat products
Type of project	Research
Funded by	national
Start year	2017
Duration (month)	36
Coordinator	Lynn Vanhaecke
Coordinator institution	Ugent
Other participant institutions	KULeuven, ILVO, FF
Participating countries	national
Subtopic	
quality of raw material	
meat products: physico-chemical traits	
meat products: boar taint	x

Name of the project	Valorisation of meat with boar taint
Type of project	Research
Funded by	national
Start year	2014
Duration (month)	24

Coordinator	Lynn Vanhaecke
Coordinator institution	Ugent
Other participant institutions	FF, ILVO
Participating countries	national
Subtopic	
quality of raw material	
meat products: physico-chemical traits	
meat products: boar taint	x

Name of the project	SUSI
Type of project	Research
Funded by	national/ERANET
Start year	2017
Duration (month)	36
Coordinator	Stefanski Volker
Coordinator institution	UHOH
Other participant institutions	ILVO,INRA,KIS,UL-VF,SEGES,WULS,WU
Participating countries	Germany, France, Slovenia, Belgium, Denmark, Poland, The Netherlands
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	x
meat products: boar taint	x

Name of the project	CASTRUM – Pig Castration for Traditional and Conventional Products: a Report on Methods and their Impacts on Animal Welfare, Meat Quality and Sustainability of European Pork Production Systems.
Type of project	Survey/report
Funded by	DG-SANTE
Start year	2016
Duration (month)	12
Coordinator	Luca Fontanesi
Coordinator institution	Department of Agricultural and Food Sciences, University of Bologna (Italy)
Other participant institutions	Martin-Luther-Universität Halle-Wittenberg, Institut de la Filière Porcine, Institute for Agricultural and Fisheries Research, Instituto de Recerca i Tecnologia Agroalimentàries, Norwegian Meat and Poultry Research Center, Kmetijski Institut Slovenije (Agricultural Institute of Slovenia), Swedish University of Agricultural Sciences, Instituto Nacional de Investigacao Agraria e Veterinaria, Council for Agricultural Research and Economics - CREA, Faculty of Agriculture in Osijek
Participating countries	Italy, Germany, France, Belgium, Spain, Norway, Slovenia, Sweden, Portugal, Croatia
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	x
meat products: boar taint	x

Name of the project	Development of traditional production of dry fermented sausages with protected designation of origin in order to obtain safe products with standard quality
Type of project	Research
Funded by	National
Start year	2011

Duration (month)	78
Coordinator	Prof. Dr Ljiljana Petrović
Coordinator institution	Faculty of Technology, University of Novi Sad
Other participant institutions	FINS
Participating countries	National
Subtopic	
quality of raw material	pH, color, WHC, meat %, composition
meat products: physico-chemical traits	aw, colour, pH, texture, microbiological analyses, composition, etc.
meat products: boar taint	

Name of the project	BOARMARKET-Potential market and meat quality from entire males
Type of project	
Funded by	National INIA funding
Start year	2011
Duration (month)	2016
Coordinator	N. Panella-Riera/A. Oliver
Coordinator institution	IRTA
Other participant institutions	Murcia University
Participating countries	Spain
Subtopic	
quality of raw material	
meat products: physico-chemical traits	
meat products: boar taint	x

Name of the project	Effectiveness of application of immunological castration for growing of entire boars.
Type of project	research
Funded by	national industry
Start year	2016
Duration (month)	12
Coordinator	Association of pig breeders of Ukraine
Coordinator institution	Association of pig breeders of Ukraine
Other participant institutions	National University of Life and Environmental Sciences of Ukraine, Sumy National Agrarian University
Participating countries	national
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	x
meat products: boar taint	

Name of the project	Multidisciplinary training in the development of novel technology (bio-sensors) for boar taint detection to assist with production of taint-free pork
Type of project	Research AND Training
Funded by	UK Agriculture and Horticulture Development Board
Start year	2014
Duration (month)	36
Coordinator	Prof. Olena Doran/Prof John Hart
Coordinator institution	University of the West of England, UWE
Other participant institutions	UK industry as project partners

Participating countries	National
Subtopic	
quality of raw material	x boar taint
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Development of (bio)sensors for detection of fatty acid composition in meat and meat products from pig and cattle
Type of project	Research AND Training
Funded by	UK Agriculture and Horticulture Development Board
Start year	2017
Duration (month)	36
Coordinator	Prof. Olena Doran/Prof John Hart
Coordinator institution	University of the West of England, UWE
Other participant institutions	UK industry as project partners
Participating countries	National
Subtopic	
quality of raw material	x fatty acids
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Novel technology (bio-sensors) for on-line detection of boar taint compounds
Type of project	Research
Funded by	UK Research Council BBSRC
Start year	2016
Duration (month)	14
Coordinator	Prof. Olena Doran/Prof John Hart
Coordinator institution	University of the West of England, UWE
Other participant institutions	UK industry as project partners
Participating countries	National
Subtopic	
quality of raw material	x boar taint
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Quality of boars, barrows and gilts
Type of project	Research
Funded by	government
Start year	2014-2016
Duration (month)	24
Coordinator	Gé Backus
Coordinator institution	Connecting Agri and Food
Other participant institutions	
Participating countries	national
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	

meat products: boar taint

Name of the project	Boars to the market - solutions for Production, Pork quality & Markers for boar taint
Type of project	Research
Funded by	BIONÆR
Start year	2016
Duration (month)	36 months
Coordinator	Marianne Sundt Sødring
Coordinator institution	Animalia
Other participant institutions	NMBU, Nortura, Norsvin
Participating countries	Norway
Subtopic	
quality of raw material	X
meat products: physico-chemical traits	X
meat products: boar taint	X

Name of the project	BoarPPM - "Boars to the market – solutions for Production, Pork quality & Markers for boar taint"
Type of project	Research
Funded by	Norwegian Research Council
Start year	2016
Duration (month)	2019
Coordinator	Marianne Sundt Sødring
Coordinator institution	Animalia (Norwegian Meat and Poultry Research Center)
Other participant institutions	Norsvin SA (Norwegian Pig Breeders Association), Norwegian University of Life Sciences, Liverpool John Moores University, Nortura AS
Participating countries	Norway, UK
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Research program: Sustainable Agriculture
Type of project	research
Funded by	national
Start year	on-going (renewable; 2018)
Duration (month)	6 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	
Participating countries	
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	x
meat products: boar taint	x

Name of the project	L4-5521: Raising entire males or immunocastration? Research of measures for boar taint reduction and emerging problems of product quality

Type of project	research
Funded by	national
Start year	2013-2016
Duration (month)	3 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	UL-VF, UL-BF, UM-FKBV
Participating countries	
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	x
meat products: boar taint	x

Name of the project	Influence of vaccination against boar taint on sexual behaviour, penile injuries, body composition and boar taint
Type of project	Research
Funded by	industry
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Zoetis, MRI Kulmbach
Participating countries	national
Subtopic	
quality of raw material	x (Entire males and IC)
meat products: physico-chemical traits	
meat products: boar taint	

Name of the project	Influence of different time points of vaccination against boar taint on its efficacy and duration(hormonal status, the sexual behaviour) and their consequences for fattening performance, body composition and meat quality and boar taint in comparison to entire and surgical castrated males
Type of project	Research
Funded by	national
Start year	2016
Duration (month)	18
Coordinator	Zöls
Coordinator institution	Clinic for swine, lmu
Other participant institutions	Uni Hohenheim, LFVZ Schwarzenau, MRI Kulmbach
Participating countries	national
Subtopic	
quality of raw material	x
meat products: physico-chemical traits	
meat products: boar taint	

Appendix 6: List of projects pertaining to Work group 6 - Consumers

Return to WG6

Name of the project	Use of alternatives in organic farming
Type of project	Literature and questionnaires
Funded by	National project
Start year	2018
Duration (month)	4
Coordinator	Marijke Aluwé
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
sensory consumer	
sensory expert	
consumer attitudes	
market attitudes	x

Name of the project	Optimal slaughter weight
Type of project	Research
Funded by	national
Start year	2013
Duration (month)	48
Coordinator	Sam Millet
Coordinator institution	ILVO
Other participant institutions	
Participating countries	national
Subtopic	
sensory consumer	
sensory expert	x
consumer attitudes	
market attitudes	
Economic feasibility	x

Name of the project	At line detection methods for boar taint
Type of project	Research
Funded by	national
Start year	2014
Duration (month)	48
Coordinator	Lynn Vanhaecke
Coordinator institution	UGent
Other participant institutions	
Participating countries	national
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	x
market attitudes	x

Name of the project	Reduction of boar taint in meat products
Type of project	Research
Funded by	national
Start year	2017
Duration (month)	36
Coordinator	Lynn Vanhaecke
Coordinator institution	Ugent
Other participant institutions	KULeuven, ILVO, FF
Participating countries	national
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	
market attitudes	

Name of the project	CASTRUM – Pig Castration for Traditional and Conventional Products: a Report on Methods and their Impacts on Animal Welfare, Meat Quality and Sustainability of European Pork Production Systems.
Type of project	Survey/report
Funded by	DG-SANTE
Start year	2016
Duration (month)	12
Coordinator	Luca Fontanesi
Coordinator institution	Department of Agricultural and Food Sciences, University of Bologna (Italy)
Other participant institutions	Martin-Luther-Universität Halle-Wittenberg, Institut de la Filière Porcine, Institute for Agricultural and Fisheries Research, Instituto de Recerca i Tecnologia Agroalimentàries, Norwegian Meat and Poultry Research Center, Kmetijski Institut Slovenije (Agricultural Institute of Slovenia), Swedish University of Agricultural Sciences, Instituto Nacional de Investigacao Agraria e Veterinaria, Council for Agricultural Research and Economics - CREA, Faculty of Agriculture in Osijek
Participating countries	Italy, Germany, France, Belgium, Spain, Norway, Slovenia, Sweden, Portugal, Croatia
Subtopic	
sensory consumer	
sensory expert	
consumer attitudes	x
market attitudes	x

Name of the project	
Type of project	
Funded by	National INIA funding
Start year	2018
Duration (month)	2021
Coordinator	N. Panella-Riera/A. Oliver
Coordinator institution	IRTA
Other participant institutions	Murcia University
Participating countries	Spain
Subtopic	
sensory consumer	
sensory expert	x
consumer attitudes	x

market attitudes

Name of the project	BOARMARKET-Potential market and meat quality from entire males
Type of project	
Funded by	National INIA funding
Start year	2011
Duration (month)	2016
Coordinator	N. Panella-Riera/A. Oliver
Coordinator institution	IRTA
Other participant institutions	Murcia University
Participating countries	Spain
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	x
market attitudes	x

Name of the project	Effectiveness of application of immunological castration for growing of entire boars.
Type of project	research
Funded by	national industry
Start year	2016
Duration (month)	12
Coordinator	Association of pig breeders of Ukraine
Coordinator institution	Association of pig breeders of Ukraine
Other participant institutions	National University of Life and Environmental Sciences of Ukraine, Sumy National Agrarian University
Participating countries	national
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	x
market attitudes	

Name of the project	Quality of boars, barrows and gilts
Type of project	Research
Funded by	government
Start year	2014-2016
Duration (month)	24
Coordinator	Gé Backus
Coordinator institution	Connecting Agri and Food
Other participant institutions	
Participating countries	national
Subtopic	
sensory consumer	
sensory expert	
consumer attitudes	
market attitudes	x

Name of the project	BoarPPM - “Boars to the market – solutions for Production, Pork quality & Markers for

	boar taint"
Type of project	Research
Funded by	Norwegian Research Council
Start year	2016
Duration (month)	2019
Coordinator	Marianne Sundt Sødring
Coordinator institution	Animalia (Norwegian Meat and Poultry Research Center)
Other participant institutions	Norsvin SA (Norwegian Pig Breeders Association), Norwegian University of Life Sciences, Liverpool John Moores University, Nortura AS
Participating countries	Norway, UK
Subtopic	
sensory consumer	
sensory expert	
consumer attitudes	x
market attitudes	

Name of the project	SuSI: Sustainability in pork production with immunocastration
Type of project	research
Funded by	H2020
Start year	2017
Duration (month)	3 years
Coordinator	Volker Stefanski
Coordinator institution	UHOH
Other participant institutions	KIS, UL-VF, INRA, ILVO, SEGES, WULS, WU
Participating countries	D, B, NL, F, DK, PL, SI
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	x
market attitudes	x

Name of the project	Research program: Sustainable Agriculture
Type of project	research
Funded by	national
Start year	on-going (renewable; 2018)
Duration (month)	6 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	
Participating countries	
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	
market attitudes	

Name of the project	L4-5521: Raising entire males or immunocastration? Research of measures for boar taint reduction and emerging problems of product quality
Type of project	research

Funded by	national
Start year	2013-2016
Duration (month)	3 years
Coordinator	Marjeta Čandek-Potokar
Coordinator institution	KIS
Other participant institutions	UL-VF, UL-BF, UM-FKBV
Participating countries	
Subtopic	
sensory consumer	x
sensory expert	x
consumer attitudes	
market attitudes	