

# **New methodology for food wastage quantification. Identifying gaps and data inconsistencies**

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## **Abstract**

- Purpose

This work is seeking to provide a methodology to quantify the food waste in a standard and European manner through the agrifood chain combining information that is becoming available at local level. The methodology will be easily replicable throughout the European Union at the municipal scale.

- Methods

This methodology for the food waste quantification at local level is based on the Statistical classification of economic activities in the European Community (NACE). This information has been merged with data from the trading income tax at municipal scale thanks to the use of the Geographic Information Systems (GIS), generating a visual tool for the localization of potential food-generation focus.

- Results

The result is an intuitive and easy to use methodology to simplify the decision making process in order to quantify the potential focus of food waste at local level. Thanks to the use of this methodology, it is possible to geographically identify the potential food-generation focus at municipal scale. Furthermore, it is possible to identify all economic activities which could generate food surpluses, classified according to stages of the agrifood chain at local level.

- Conclusions

This new methodology generates straightforward and easy-to-interpret results for the decision making process in the framework of the quantification of the food waste at local scale and it provides adequate procedures which are easy adaptable to the specific circumstances in each municipality. Moreover, this method could have applications for larger territorial contexts, as the national scale, detecting possible points for improvement of the current official figures about this problem.

## **Keywords**

Food waste, food losses, quantification methodology, food wastage, waste quantification, agrifood chain

## **Introduction**

According to the Food and Agriculture Organization of United Nations report, roughly one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year [2]. This social and environment problem has been further emphasized by the European Parliament [3] and the challenge of food waste measurement and of quantification was also addressed within the framework of the European Union [4] where the food waste figures at national level were published.

These data have served as the starting point for those Member States which have no studies regarding the food waste at national level. However, the European Court of Auditors puts into question the effectiveness provided for by European rules. It includes the target to halve per capita food waste by 2030 throughout the agrifood chain because there is no a base year defined in order to set the reduction target for 2030 [5].

This lack of information at national level was also expressed in the European project called FUSIONS [6] where it is possible to identify significant differences between European Union Member States in terms of the availability of information about food waste at national level:

Country	1. Production (NACE 1-3)	2. Processing (NACE 10-11)	3. Wholesale and logistics (NACE 46)	4. Retail and markets (NACE 47)	5. Redistribution (food donation etc.)	6. Food service (NACE 56)	7. Household
Austria	No data available	Food waste data of low quality	No data available	Data of sufficient quality	Data has been submitted but no estimation of food waste amounts has been made.	Data of sufficient quality	Data of sufficient quality
Belgium	Food waste data of low quality	Food waste data of low quality	Food waste data of low quality	Food waste data of low quality	No data available	Food waste data of low quality	Food waste data of low quality
Bulgaria	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Croatia	Low food waste amounts	Low food waste amounts	Low food waste amounts. Several or major waste flows not being covered.	Low food waste amounts. Several or major waste flows not being covered.	No data available	Low food waste amounts. Several or major waste flows not being covered.	Low food waste amounts. Several or major waste flows not being covered.
Cyprus	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Czech republic	Low food waste amounts without any explanation given	Low food waste amounts	Food waste data of low quality	Food waste data of low quality	No data available	Low food waste amounts. No explanation on what was included.	Several or major waste flows not being covered.
Denmark	Data of sufficient quality	Data of insufficient quality as only edible food waste was reported.	Data of sufficient quality	Data of sufficient quality	No data available	Data of sufficient quality	Data of sufficient quality
Estonia	No data available	Low food waste amounts	Data of sufficient quality	Data of sufficient quality	No data available	Low food waste amounts	Data of sufficient quality
Finland	Data of sufficient quality	Data of insufficient quality as only edible food waste was reported.	No data available	High food waste amounts. No explanation on what was included.	No data available	Data of sufficient quality	Data of sufficient quality
France	Data of sufficient quality	Data of sufficient quality	High food waste amounts. No explanation on what was included.	High food waste amounts. No explanation on what was included.	No data available	Data of sufficient quality	No information on what was included was retrieved.
Germany	Data of sufficient quality	Data of sufficient quality	Data of sufficient quality	Data of sufficient quality	No data available	Data of sufficient quality	Data of sufficient quality
Greece	Low food waste amounts without any explanation given	High food waste amounts.	Data of sufficient quality	Data of sufficient quality	No data available	Low food waste amounts. No information on what was included was retrieved.	No information on what was included was retrieved.
Hungary	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Ireland	No data available	No data available	High food waste amounts. No information on what was included was retrieved.	High food waste amounts. No explanation on what was included.	Data has been submitted but no estimation of food waste amounts has been made.	Data of sufficient quality	Data of sufficient quality
Italy	Data of sufficient quality	Data of insufficient quality as only edible food waste was reported.	Data of sufficient quality	Data of sufficient quality	No data available	Data of insufficient quality as only edible food waste was reported.	No information on what was included was retrieved.
Latvia	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Lithuania	Low food waste amounts	Data of sufficient quality	Data of insufficient quality.	Data of insufficient quality.	No data available	Data of insufficient quality.	No information on what was included was retrieved.
Luxembourg	No data available	Low food waste amounts without any explanation given	Data of sufficient quality	Data of sufficient quality	No data available	Low food waste amounts without any explanation given	Data of sufficient quality (excluding sewer and home composting)
Malta	No data available	Data of insufficient quality.	No data available	No data available	No data available	No data available	Data of sufficient quality (excluding sewer and home composting)
Netherlands	No data available	No data available	No data available	Data of sufficient quality	Data has been submitted but no estimation of food waste amounts has been made.	Several or major waste flows not being covered.	Data of sufficient quality (excluding home composting)
Poland	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Portugal	No information on what was included was retrieved.	No information on what was included was retrieved.	No data available	No data available	No data available	No data available	No data available
Romania	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Slovakia	Low food waste amounts. Several or major waste flows not being covered.	Several or major waste flows not being covered.	No data available	No data available	No data available	No data available	No data available
Slovenia	Low food waste amounts. Several or major waste flows not being covered.	No explanation of what was included in the amounts could be given.	Data of sufficient quality	Data of sufficient quality	No data available	Low food waste amounts. Several or major waste flows not being covered.	Park waste and non household MSW are included in the amounts
Spain	No data available	No data available	No data available	No data available	No data available	No data available	No data available
Sweden	Data of sufficient quality	Byproducts are included in the amounts.	No data available	Data of sufficient quality	No data available	Data of sufficient quality	Data of sufficient quality
United Kingdom	Data of insufficient quality.	Data of sufficient quality	Data of sufficient quality	Data of sufficient quality	No data available	Data of sufficient quality	Data of sufficient quality

Figure 1 and 2 Countries Providing Data. FUSIONS.  
In red “no data available” / Yellow “low quality” / Green “sufficient quality”

Those countries that contain information designated as “sufficient quality” (green colour) are fundamentally linked to the existence of national reports carried out to have the food waste figures in their own countries. The remaining countries generally publish as official figures the information provided in the above-mentioned report by the European Commission [5] which usually come from estimates with certain gaps and inconsistencies.

At local level, the situation is quite similar despite the existence of action protocols to quantify the food waste at this scale [1, 7]. These protocols are ample and robust and visual tools might be required in order to facilitate the implementation of the procedures and build an enabling framework for decision making within the general course of action to gather data from the food waste at municipal scale.

Accordingly, this paper seeks to provide a methodology for the establishment of a visual tool to help in making decisions on the food waste at local level along the agrifood chain or in the various phases of the value chain. In addition, this methodology helps assess the representativeness of the data about food

waste at local level previously obtained, and it allows for the development of a comparative framework between different municipalities. Furthermore, it can be useful to identify possible gaps and inconsistencies in official data published at national level.

### Methodology

The methodology employed is based on the classification of economic activities in the European Community (NACE), where the different categories are divided into sections, divisions, groups and classes (see Figure 3):

Division	Group	Class	ISIC Rev. 4
<b>SECTION A — AGRICULTURE, FORESTRY AND FISHING</b>			
01		Crop and animal production, hunting and related service activities	
	01.1	Growing of non-perennial crops	
		01.11 Growing of cereals (except rice), leguminous crops and oil seeds	0111
		01.12 Growing of rice	0112
		01.13 Growing of vegetables and melons, roots and tubers	0113
		01.14 Growing of sugar cane	0114
		01.15 Growing of tobacco	0115
		01.16 Growing of fibre crops	0116
		01.19 Growing of other non-perennial crops	0119
		01.2 Growing of perennial crops	
		01.21 Growing of grapes	0121
		01.22 Growing of tropical and subtropical fruits	0122
		01.23 Growing of citrus fruits	0123
		01.24 Growing of pome fruits and stone fruits	0124
		01.25 Growing of other tree and bush fruits and nuts	0125
		01.26 Growing of oleaginous fruits	0126
		01.27 Growing of beverage crops	0127
		01.28 Growing of spices, aromatic, drug and pharmaceutical crops	0128
		01.29 Growing of other perennial crops	0129
		01.3 Plant propagation	
		01.30 Plant propagation	0130
		01.4 Animal production	
		01.41 Raising of dairy cattle	0141*
	01.42 Raising of other cattle and buffaloes	0141*	
	01.43 Raising of horses and other equines	0142	
	01.44 Raising of camels and camelids	0143	

Figure 3 Example of the detailed structure of NACE.

Thus, those categories, which could potentially generate food surpluses, have been defined and broken down in classes. In this manner, it avoids referring to higher categories, as has been the case in previous studies [5]. The main drawback of these previous studies is the possibility of including data regarding economic activities which could potentially generate food surpluses not intended for human consumption.

Having read the different classes, three types of situations have been distinguished:

- Potential Food-Generation Surpluses. Because of their economic activity, defined in the official EUROSTAT document [8], might be susceptible to generate food surpluses.
- Non-Potential Food-Generation Surpluses. Because of their economic activity cannot be susceptible to generate food surpluses.
- In-situ Verification. Occasionally, there are some classes where are included some activities with potential food-generation surpluses and others with non-potential food generation. For this reason, it is necessary to verify in-situ the concrete economic activity linked with the specific case.

Section	Division	Group	Class	ISIC Rev. 4		
SECTION A — AGRICULTURE, FORESTRY AND FISHING	01 Crop and animal production, hunting and related service activities	01,1 Growing of non-perennial crops	01,11	Growing of cereals (except rice), leguminous crops and oil seeds	0111	
			01,12	Growing of rice	0112	
			01,13	Growing of vegetables and melons, roots and tubers	0113	
			01,14	Growing of sugar cane	0114	
			01,15	Growing of tobacco	0115	
			01,16	Growing of fibre crops	0116	
			01,19	Growing of other non-perennial crops	0119	
			01,2 Growing of perennial crops	01,21	Growing of grapes	0121
				01,22	Growing of tropical and subtropical fruits	0122
		01,23		Growing of citrus fruits	0123	
		01,24		Growing of pome fruits and stone fruits	0124	
		01,25		Growing of other tree and bush fruits and nuts	0125	
		01,26		Growing of oleaginous fruits	0126	
		01,27		Growing of beverage crops	0127	
		01,28		Growing of spices, aromatic, drug and pharmaceutical crops	0128	
		01,29		Growing of other perennial crops	0129	
		01,3 Plant propagation	01,30	Plant propagation	0130	
		01,4 Animal production	01,41	Raising of dairycattle	0141*	
			01,42	Raising of other cattle and buffaloes	0141*	
			01,43	Raising of horses and other equines	0142	
			01,44	Raising of camels and camelids	0143	
			01,45	Raising of sheep and goats	0144	
			01,46	Raising of swine/pigs	0145	
			01,47	Raising of poultry	0146	
			01,49	Raising of other animals	0149	
			01,50	Mixed farming	0150	

Potential Food-Generation Surpluses

No Potential Food-Generation Surpluses

In-Situ Verification

Figure 4 and 5 Example of the detailed structure of NACE, identifying the different types of classes in accordance with their potentiality as a food surpluses generator

After defining all classes from NACE, under one of the three typologies stated above: Potential Food-Generation Surpluses, Non-Potential Food-Generation Surpluses and In-situ Verification, those categories which are referred as Potential Food-Generation Surpluses and In-situ Verification have been selected and they have been classified according to the stage of the agrifood chain to which it belongs:

Step Agrifood Chain	Section	Division	Group	Class	ISIC Rev. 4		
P R O D U C T I O N	SECTION A — AGRICULTURE, FORESTRY AND FISHING	01 Crop and animal production, hunting and related service activities	01,1 Growing of non-perennial crops	01,11	Growing of cereals (except rice), leguminous crops and oil seeds	0111	
				01,12	Growing of rice	0112	
				01,13	Growing of vegetables and melons, roots and tubers	0113	
				01,14	Growing of sugar cane	0114	
				01,19	Growing of other non-perennial crops	0119	
				01,2 Growing of perennial crops	01,21	Growing of grapes	0121
					01,22	Growing of tropical and subtropical fruits	0122
					01,23	Growing of citrus fruits	0123
					01,24	Growing of pome fruits and stone fruits	0124
			01,25		Growing of other tree and bush fruits and nuts	0125	
		01,26	Growing of oleaginous fruits		0126		
		01,27	Growing of beverage crops		0127		
		01,28	Growing of spices, aromatic, drug and pharmaceutical crops		0128		
		01,29	Growing of other perennial crops		0129		
		01,3 Plant propagation	01,30	Plant propagation	0130		
		01,4 Animal production	01,41	Raising of dairycattle	0141*		
			01,42	Raising of other cattle and buffaloes	0141*		
			01,43	Raising of horses and other equines	0142		
			01,44	Raising of camels and camelids	0143		
			01,45	Raising of sheep and goats	0144		
01,46	Raising of swine/pigs		0145				
01,47	Raising of poultry		0146				
01,49	Raising of other animals		0149				
01,50	Mixed farming		0150				
01,5 Mixed farming	01,50	Mixed farming	0150				
	01,6 Support activities to agriculture and post-harvest crop activities	01,61	Support activities for crop production	0161			
		01,62	Support activities for animal production	0162			
		01,63	Post-harvest crop activities	0163			
	01,7 Hunting, trapping and related service activities	01,70	Hunting, trapping and related service activities	0170			
	03 Fishing and aquaculture	03,1 Fishing	03,11	Marine fishing	0311		
			03,12	Freshwater fishing	0312		
		03,2 Aquaculture	03,21	Marine aquaculture	0321		
			03,22	Freshwater aquaculture	0322		
10,1 Processing and preserving of meat and production of meat products	10,1 Processing and preserving of meat and production of meat products	10,11	Processing and preserving of meat	1010*			
		10,12	Processing and preserving of poultry meat	1010*			
		10,13	Production of meat and poultry meat products	1010*			
	10,2 Processing and preserving of fish,	10,20	Processing and preserving of fish, crustaceans and molluscs	1020			

Figure 6 Example of the detailed structure of economic activities with potential food-generation surpluses categorized by steps of the agrifood chain

Thus, the methodology proposes to consider the entire agrifood chain, highlighting the following main steps: **Production, Manufacturing, Distribution and Consumption**. Thanks to this categorization, it is possible to define which economic activities are potentially generators of food surpluses along the agrifood chain. Therefore, it helps to identify the group of economic activities where it is necessary to focus on the food waste quantification throughout the agrifood chain or for a specific step, according to the local legal frameworks or strategies.

Once this general framework is obtained, applicable to any municipal area within the European Union, the information is linked with the trading income tax at local level because all the entities, public and private, are connected with a particular class from NACE, identified by a specific code.

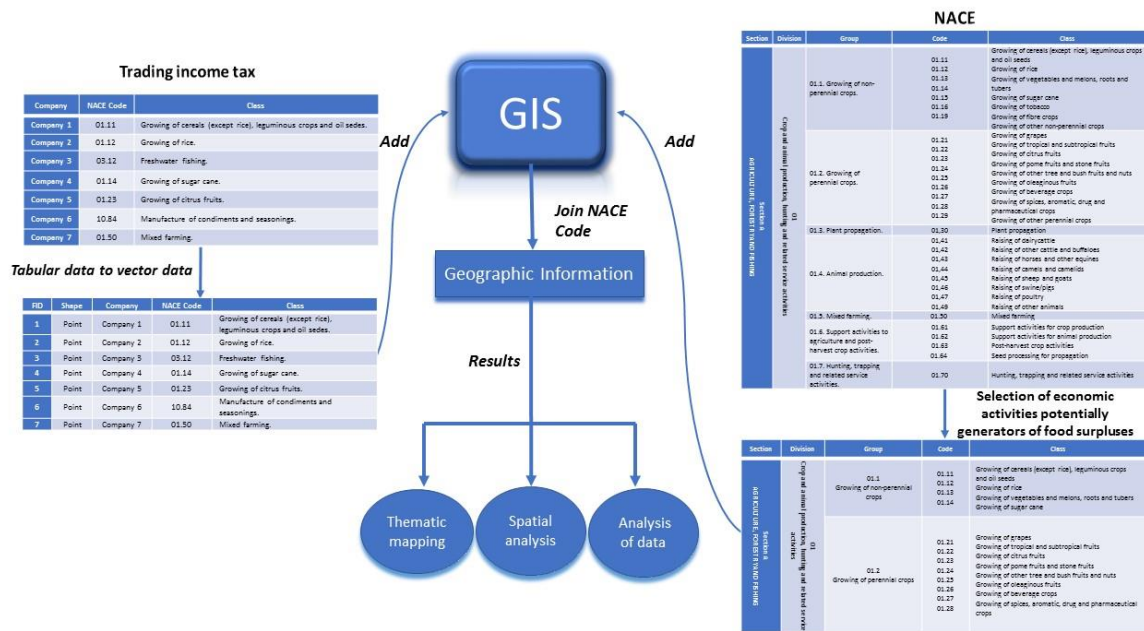


Figure 7 Theoretical approach on the methodology proposed

In this manner, thanks to the use of the GIS, it is possible to link the information on typologies classified as Potential Food-Generation Surpluses, Non-Potential Food-Generation Surpluses and In-situ Verification, with each of the entities which are part of the municipality studied.

The geographical information included in the trading income tax makes possible to create maps at local scale, where all potential focus of food surpluses generation are defined as well as their economic impact along the entire agrifood chain and classified according to the different stages.

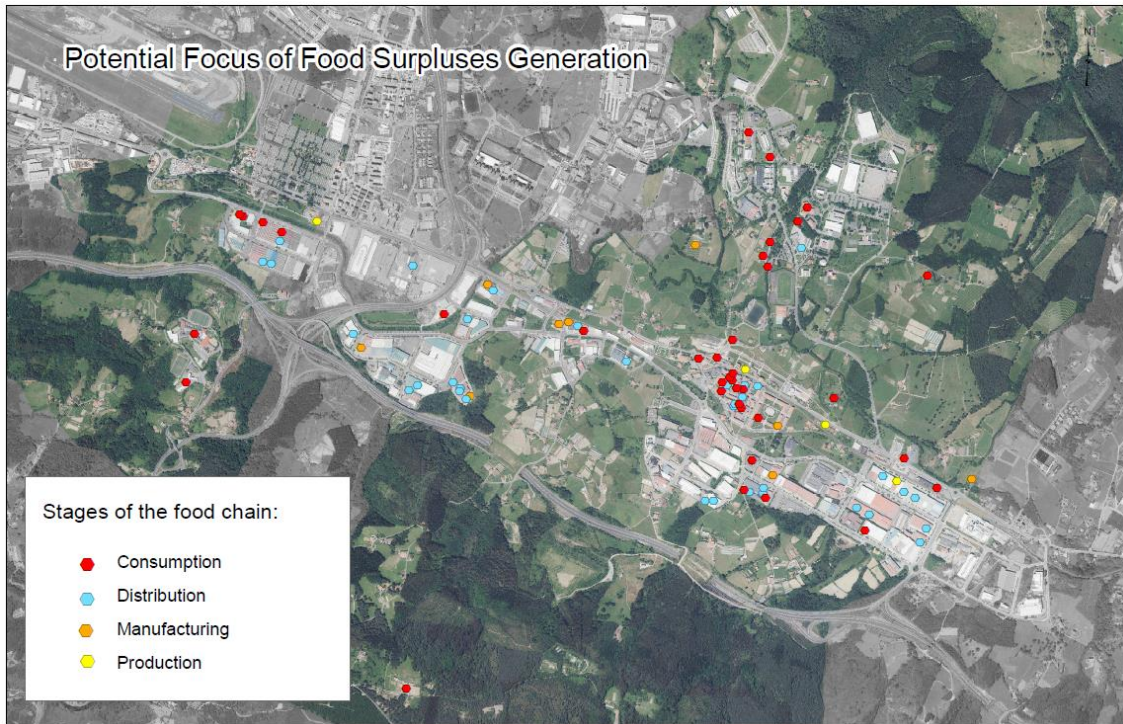


Figure 8 Example of the Localization of Potential Food-Generation Focus. The municipality of Zamudio

The location of these potential focuses could define the singularity of each municipal territory regarding the food waste generation because the households are the only missing component to complete all the relevant information about the food waste situation in each municipality. However, this component can be determined without so much difficulty to estimate the food waste generation because it is possible to use the municipal census and reliable rates of food waste generation per capita.

Likewise, another way of displaying the potential focus of food surpluses generation is using a data table which provides to identify the number of entities related to the different types catalogued as Potential Food-Generation Surpluses and In-situ Verification, so that these entities are displayed and classified according to the stages of the food value. Therefore, it is possible to delimitate the entire agrifood chain related with the potential to generate food surpluses at local level.

Step Agrifood Chain	Section	Division	Group	Class	ISIC Rev. 4	Municipality 1 (Number of entities)
P R O D U C T I O N	SECTION A — AGRICULTURE, FORESTRY AND FISHING	01 Crop and animal production, hunting and related service activities	01,1 Growing of non-perennial crops	01.11 Growing of cereals (except rice), leguminous	0111	2
				01.12 Growing of rice	0112	
				01.13 Growing of vegetables and melons, roots and	0113	1
				01.14 Growing of sugar cane	0114	
				01.19 Growing of other non-perennial crops	0119	1
			01,2 Growing of perennial crops	01.21 Growing of grapes	0121	
				01.22 Growing of tropical and subtropical fruits	0122	
				01.23 Growing of citrus fruits	0123	
				01.24 Growing of some fruits and stone fruits	0124	
				01.25 Growing of other tree and bush fruits and nuts	0125	
				01.26 Growing of oleaginous fruits	0126	
				01.27 Growing of beverage crops	0127	
			01,4 Animal production	01.28 Growing of apices, aromatic, drug and	0128	
				01.41 Raising of dairy cattle	0141*	
				01.42 Raising of other cattle and buffaloes	0142	
01.43 Raising of horses and other equines	0143					
01.44 Raising of camels and camelids	0143					
01.45 Raising of sheep and goats	0144	1				
01.46 Raising of swine/pigs	0145					
01.47 Raising of poultry	0146					
01.49 Raising of other animals	0149					
01,5 Mixed farming	01.50 Mixed farming	0150	3			
	01,6 Support activities to agriculture and post-harvest crop activities	01.61 Support activities for crop production	0161			
		01.62 Support activities for animal production	0162			
01,7 Hunting, trapping and related service activities	01.63 Post-harvest crop activities	0163	1			
	01.70 Hunting, trapping and related service activities	0170				
03 Fishing and aquaculture	03,1 Fishing	03.11 Marine fishing	0311			
		03.12 Freshwater fishing	0312			
	03,2 Aquaculture	03.21 Marine aquaculture	0321			
		03.22 Freshwater aquaculture	0322			
10,1 Processing and preserving of meat and production of meat products	10.11 Processing and preserving of meat	1010*	5			
	10.12 Processing and preserving of poultry meat	1010*	1			
	10.13 Production of meat and poultry meat products	1010*	1			

Figure 9 Example of the number of entities with potential food-generation surpluses categorized by steps of the agrifood chain at local level

## Results

The most relevant results thanks to the use of this methodology are obtained at local level. Obtaining all the potential focuses of food surpluses generation throughout the agrifood chain, for each and all phases, it is possible to identify all the entities susceptible to quantify the food waste situation at each of these stages, in a visual and intuitive manner. It facilitates the work of the policy-makers to establish strategies for the quantification of the food waste.

Furthermore, the results, achieved throughout the data table (Figure 10), generate a comparative framework between different municipalities which have been used this methodology. It delimits all the economic activities likely to generate food surpluses for each stage of the agrifood chain so as to avoid remaining simply final numbers of food wastage generated and find some of the main reasons of this problem as a result of the principal economic activities that produce it and helps the decision-making process.

Section	Division	Group	Class	ISIC Rev. 4	Municipality 1 (Number of entities)	Municipality 2 (Number of entities)	
SECTION A — AGRICULTURE, FORESTRY AND FISHING	01 Crop and animal production, hunting and related service activities	01,1 Growing of non-perennial crops	01.11	Growing of cereals (except rice), leguminous	0111	2	3
			01.12	Growing of rice	0112	1	1
			01.13	Growing of vegetables and melons, roots and	0113		
			01.14	Growing of sugar cane	0114		
			01.19	Growing of other non-perennial crops	0119	1	
		01,2 Growing of perennial crops	01.21	Growing of grapes	0121		
			01.22	Growing of tropical and subtropical fruits	0122		
			01.23	Growing of citrus fruits	0123		
			01.24	Growing of some fruits and stone fruits	0124		
			01.25	Growing of other tree and bush fruits and nuts	0125		
			01.26	Growing of oleaginous fruits	0126		2
			01.27	Growing of beverage crops	0127		
			01.28	Growing of spices, aromatic, drug and	0128		
		01,4 Animal production	01.41	Raising of dairy cattle	0141*		
			01.42	Raising of other cattle and buffaloes	0141*		
			01.43	Raising of horses and other equines	0142		
			01.44	Raising of camels and camelids	0143		
	01.45		Raising of sheep and goats	0144	1	1	
	01.46		Raising of swine/pigs	0145			
	01.47		Raising of poultry	0146			
	01.49		Raising of other animals	0149			
	01,5 Mixed farming	01.50	Mixed farming	0150	3	2	
		01,6 Support activities to agriculture and post-harvest crop activities	01.61	Support activities for crop production	0161		
01.62			Support activities for animal production	0162			
01.63			Post-harvest crop activities	0163	1		
01,7 Hunting, trapping and related service activities	01.70	Hunting, trapping and related service activities	0170				
03 Fishing and aquaculture	03,1 Fishing	03.11	Marine fishing	0311			
		03.12	Freshwater fishing	0312			
	03,2 Aquaculture	03.21	Marine aquaculture	0321			
03.22	Freshwater aquaculture	0322					
	10,1 Processing and preserving of meat and production of meat products	10.11	Processing and preserving of meat	1010*	5	1	
		10.12	Processing and preserving of poultry meat	1010*	1		
		10.13	Production of meat and poultry meat products	1010*	1	3	

Figure 10 Example of the comparison between two municipalities regarding the number of entities with potential food-generation surpluses categorized by steps of the agrifood chain

Finally, this methodology contributes to the detection of gaps and inconsistencies in previous studies of the food waste quantification by comparing the number of entities potentially generators of food surpluses detected, thanks to the use of this methodology with those entities where actions of quantification of food waste were carried out. Thus, it allows checking the level of representativeness of the data of the agrifood chain at local level as well as the main steps of the value chain.

This detection of inconsistencies can also apply to the national scale, especially for those countries where the official figures are from the above-mentioned European Commission report [4], because the quantification methodology used data from animal and vegetal waste broken down into some sections, divisions, groups and classes from NACE.

Nevertheless, that methodology barely uses classes from NACE, therefore the categories employed for food waste quantification at national level encompassed not only economic activities likely to generate food surpluses but also another classes moved away from the concept of food waste generation, as well as not including classes which are susceptible to generate food waste along the agrifood chain.

Thus, using the methodology proposed is possible to detect gaps, information needs and inconsistencies within the current official figures of food waste at national level. To do this, it is necessary to compare the categories employed to prepare the national report about food wastage, with those classes likely to generate food surpluses. In this way, the current official figures could be improved in terms of information quality and showing gaps and shortcomings. Thanks to that, it would be possible to provide a more comprehensive idea of their adequacy to serve as a baseline or it is necessary to promote further initiatives in the area of the food waste quantification at national scale.

## Conclusions

This document sought to make a contribution proposing a new quantification methodology about the food waste with the aim of making progress on improving the food waste knowledge and evaluating the level of reliability of the current official figures at local scale and it allows for the development of a comparative framework between different municipalities.

Moreover, this methodology represents a step forward to identify information and data gaps about the current food waste data at different scales. Thanks to the proposed methodology is possible to specify more aspects related to the different economic activities likely to generate food surpluses. Thus, it is possible to identify the group of economic activities which are providing the current official figures at national level and at the same time it helps to detect gaps in specific activities.

Based on the identification of those gaps is possible to give priority to studies at local and regional scales to fill the existing lack of information regarding the food waste and improving the reliability of the official figures at different scales.

Furthermore, it aims to prompt thought, dialogue and constructive debate about the need for further progress in the food waste quantification at the different levels of management (local and national), particularly for searching a rigorous vision and diagnosis of the situation in order to establish a basis about where to set reduction targets in the short, medium and long term.

This report therefore emphasises the need to move towards better methodologies to quantify the food waste at national level, using information which is already available. This would entail an effective and pragmatic way of creating a diagnosis about the food waste at local and national scale, but at the same time it seeks to provide a critical review to drive and lead to new quantification studies about this problem at different scales. Thus, it would avoid remaining information with possible means of improvement as official figures because these data could not be used as the basis for carrying out strategies for the current food waste reduction. That aspect represents a fundamental step to address the problems and propose solutions or improvements of this global phenomenon which is having severe negative effects at economic, social, environmental levels as well as an important impact on social and ethic issues.

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