

# PLATFORMS

## SUSTAINABLE FOOD PLATFORMS: ENABLING SUSTAINABLE FOOD PRACTICES THROUGH SOCIO-TECHNICAL INNOVATION

### WP1

#### MAPPING FOOD PROVISIONING SERVICES

#### CROSS-COUNTRY REPORT

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# THE PROJECT

In recent years, we have seen an increase in the range of food provisioning platforms available to consumers. Each platform presents consumers with a unique choice architecture. These emerge from both e-commerce development and consumer-driven food provisioning. Little is known about the impact of these new platforms on food choices, or to what degree they represent new opportunities to promote sustainable food practices.

PLATEFORMS aims to produce in-depth knowledge on how food practices are affected by socio-technical innovations in food provisioning platforms, and communicate success stories of sustainability to platform owners and policy makers. The project includes both business-driven platforms (e.g supermarkets, online stores) and consumer-driven platforms (e.g food cooperatives).

Methodologically and theoretically, the project is positioned between individualistic and systemic approaches - whereas the first is focusing on changing individual consumer behavior, and the second is ignoring consumers in favor of other actors and more 'macro' solutions. More specifically, this project takes a socio-technical practice approach, seeing consumption in all its phases of planning, provisioning, storing, cooking, eating, and disposing - driven by practices more than by individual choices.

The project will promote sustainable food choices through involvement with platform owners, dissemination of academic results and communication of sustainable success stories across countries and platforms. The communication will target platforms owners, policy makers, and NGOs. By producing new in-depth knowledge about concrete strategies to enable sustainable food consumption through food provisioning platforms, the project will affect consumer practices and choices on a larger scale. Moreover, through intervention studies and collaboration with platform owners, it will be possible to quantify the effect of interventions.

Keywords: Sustainable food consumption, household food practices, provisioning platforms, socio-technical innovation

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# 1

## INTRODUCTION

The following report summarises some key findings emerged from the analysis of a cross-country dataset on online food provisioning services gathered for project PLATEFORMS, an Eranet Cofund in Horizon 2020 which aims to produce in-depth knowledge on how food practices are affected by innovations in food provisioning. The objective of the present work is to provide a general description of online food provisioning services in Germany, Ireland, Italy, Norway and Sweden with a special focus on pipelines and platforms. As Figure 1 below illustrates, online food shopping - i.e. the digital purchase of at least one food item over the last 12 months - has considerably increased in all countries over the past 4 years, albeit marked differences can be noticed. While in Italy and Ireland, only 4% and 6% of individuals have completed at least one online food purchase over the past 12 months, this percentage is much higher for Norway (14%), Sweden (19%), and especially Germany (19%). Nonetheless, when compared with other goods, online food shopping in all countries is still far behind: in 2018, considering online purchases over the past 12 months, more than 40% of individuals in the EU purchased online furniture or toys, more than 50% booked travel or online accommodation, and more than 60% acquired clothes or sports good<sup>1</sup>.

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<sup>1</sup> Data come from the Eurostat survey on online purchases. See: <https://tinyurl.com/s84tnyy>

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## PERCENTAGE OF INDIVIDUALS THAT HAVE PURCHASED FOOD ONLINE AT LEAST ONCE IN THE LAST 12 MONTHS

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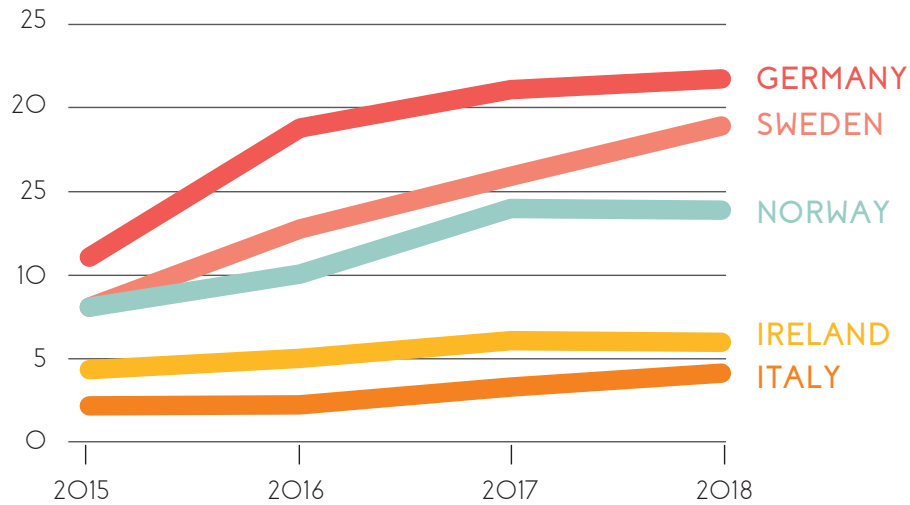


Figure 1. Percentage of individuals that have purchased food online in the past 12 months. Source: Eurobarometer data.

The report is structured as follows: we first provide a description of the methodology adopted to gather the data. Secondly, we present some key findings regarding the general characteristics of the online food provisioning services by country. In particular, we concentrate on the organisational features and on the value commitments of the online food provisioning services. Thirdly, we focus on the food sold by the provisioning services by using Latent Class Analysis (LCA). LCA is a statistical techniques which allows to empirically identify unobserved classes, in this case typologies of food products, from a number of discrete observed variables, thus enabling to make a distinction on the basis of the categories of food available in the dataset (see below pag.12). Finally, we use the pooled dataset to present the most important differences between food pipelines and platforms.

# 2

## DATA AND METHODS

### 2.1 DATA COLLECTION

The PLATFORM dataset has been constructed by gathering data on the population of online food provisioning services (OFPS) active in Germany, Ireland, Italy, Norway and Sweden between December 2018 and April 2019. We use the general term OFPS to define all the profit and non-profit organisations that operate as food suppliers or intermediaries in the food e-commerce. In order to gather information on all the OFPS, one coder for each country was used to search the following keywords, translated in each country language, on Google.com, Google App store, and Apple Marketplace search engines between December 2018 and April 2019: 'Online food shopping', 'Grocery shopping online', 'Online food purchase', 'Grocery shopping online', 'Organic food online', 'Local food online', 'Food sharing apps'. The search was subsequently redefined adding regional codes to each keyword (see the appendix for further informations), so as to increase the probability of finding smaller or local provisioning services. As the project aims to map the food provisioning services that potentially allow people to purchase a variety of food items on the internet, we excluded all the OFPS selling either i) only one type of food category (e.g. only meat, only dairy, only vegetables, only wine) or ii) only from one brand (e.g. only Barilla), or iii) only from one producer. After the initial screening and deletion of duplicates, 524 food shopping websites were identified as food provisioning services across all countries. The OFPS are distributed as follows: 86 in Germany, 90 in Ireland, 211 in Italy, 81 in Norway, 56 in Sweden.

The content analysis of the websites followed a two-stage process. A first version of the codebook has been used to conduct the analysis on all the retrieved OFPS. The codebook contained indications on how to operationalise information on the following dimensions of OFPS, from each website (see pag. 30): organisational form of the e-commerce, food categories sold, sales mechanism, digital presence, and six values commitments we have identified as the most important for our purposes. Value commitments refer to the presence in the website of statements regarding local food,

wellbeing, environment, equity, nutrient needs, and food waste. The codebook in the appendix contains full information on all variables, the coding procedure and the specific information gathered by each coder. Therefore, in order to validate our methodology, all the researchers involved in the project gathered in a Skype meeting to discuss the most ambiguous variables, which have been subsequently re-analysed on a separate dataset containing a random selection of 30 OFPS based in England. This choice allowed coders to analyse the reliability dataset in the only language that was comprehensible to all. Following the results of the reliability test, the average pairwise percent agreement, Fleiss' K and Krippendorff's K, have been used to discard or simplify (i.e. reducing the number of response categories) the less reliable variables.

## 2.2 PIPELINES AND PLATFORMS

Of utmost importance for the project is the distinction between pipelines and platforms. Following Parker et al<sup>2</sup>, we use the former term to define a 'business that employs a step-by-step arrangement for creating and transferring value, with producers at one end and consumers at the other'. In the digital food commerce, we can distinguish between single-sided and two-sided digital platform. Pipelines corresponds to single-sided online markets which control all phases of the sale: from the selection and presentation of the food products, to the shipment/collection procedure of the purchase to/from the customer.

Differently, a platform business is 'based on enabling value creating interac-

tions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them. The platform's overarching purpose: to consummate matches among users and to facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants'. In the digital food market platforms can act as intermediary between producers and consumers (B2C), consumers and consumers (C2C), producers and intermediaries - i.e. other business, producers, retailers (B2B), and aim to facilitate the match between the two (or more) parts, by offering a web-space that allows the contact or the transaction. Although platforms may be directly involved in the packaging and delivery of products, also having the possibility to directly select the producers that fit the platform's mission and vision, food suppliers are always visible and traceable from customers and receive the online order of food products only after the customer completed the purchase on the platform website. The presence of at least one of the following criteria was used to establish whether the provisioning service could be defined as a food platform (see pag.27):

1. The website/app has two separate sections, one dedicated to producers and one dedicated to consumers (or other businesses, in the case of B2B platforms) where they can register in order to 'start selling' or 'start buying' food products.
2. The website clearly states that the online orders are directly forwarded to the producers who have the responsibility to manage them.
3. The website offers an online window shop to producers (usually in exchange of a monthly/annual fee), that are thus allowed to use the platform to sell their products to the consumers.
4. The website offers to consumers a service to get in contact in order to exchange or sell food products to each other (C2C business)

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2 Parker, G. G., Van Alstyne, M., Choudary, S. P., & Foster, J. (2016). Platform revolution: How networked markets are transforming the economy and how to make them work for you. New York: WW Norton. (pp. 5-6).

# 3

## A GENERAL OVERVIEW

### 3.1 TREND OVER TIME AND TYPE OF OFPS

Figure 2 below uses the pooled sample to illustrate the number of OFPS, still in business, by year of foundation. In line with reports suggesting the growing success of food e-commerce all over Europe, the number of new OFPS selling groceries online has almost steadily increased from 1998 to 2018, apart from a small decline in 2017 and 2018.

#### NUMBER OF NEW ONLINE FOOD PROVISIONING SERVICES

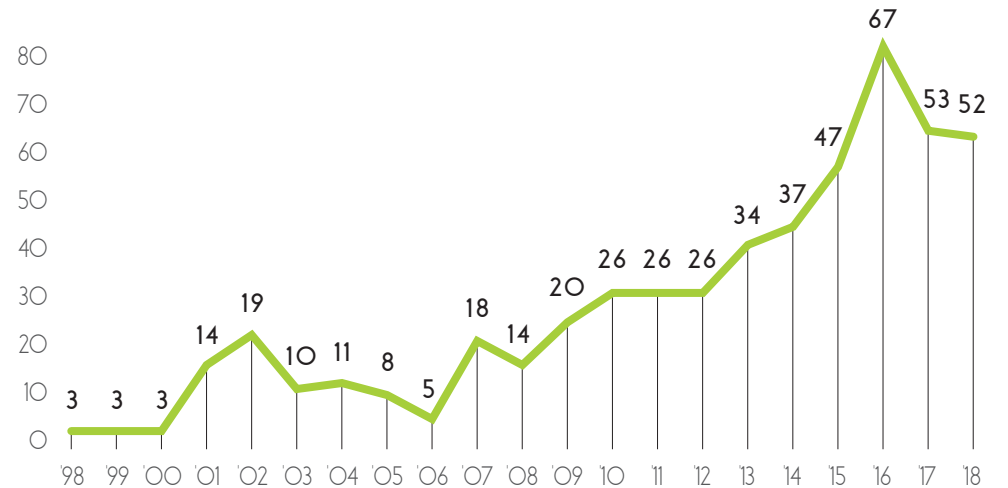


Figure 2. Number of online food provisioning services by year of foundation. N = 499 (25 'not reported')

Figure 3 illustrates instead country differences by type of OFPS. We distinguished between 4 typologies. Mass retail channel, which overall represent the 9.35% of all identified OFPS, are the online distribution and pick-up services organised by supermarket chains in each country, such as Coop or Esselunga in Italy, Meny and Spar in Norway, Willys in Sweden, Tesco in Ireland, and Alnatura in Germany. Independent stores (31.5%) are instead



the websites of small food boutiques and grocers, usually specialised in a few product categories, which allow users to buy online. Alternative Food Networks, constitute 10.5% of the websites, including all the organisation that promote forms, or production and distribution of food products, conceived of as being in opposition to conventional supermarket-led food chains. Finally, Online only OFPS, the majority in our dataset (48.7%), are different from all the others as they exist only as digital stores. Country differences are however very marked, as the proportion of each OFPS varies to a great extent and present an almost unique configuration in each country. Ireland, due to the low level of retailer concentration, has the lowest number of mass retail channels active online, and the highest proportion of AFN (22.2%). Independent stores are the leading typology in Germany (58.1%) and Ireland (43.3%), while being less common in Scandinavian countries. Online only stores are instead very active in Sweden (76.8%), Norway (56.8%) and Italy (57.4%), but they are much less common in Germany and Ireland.

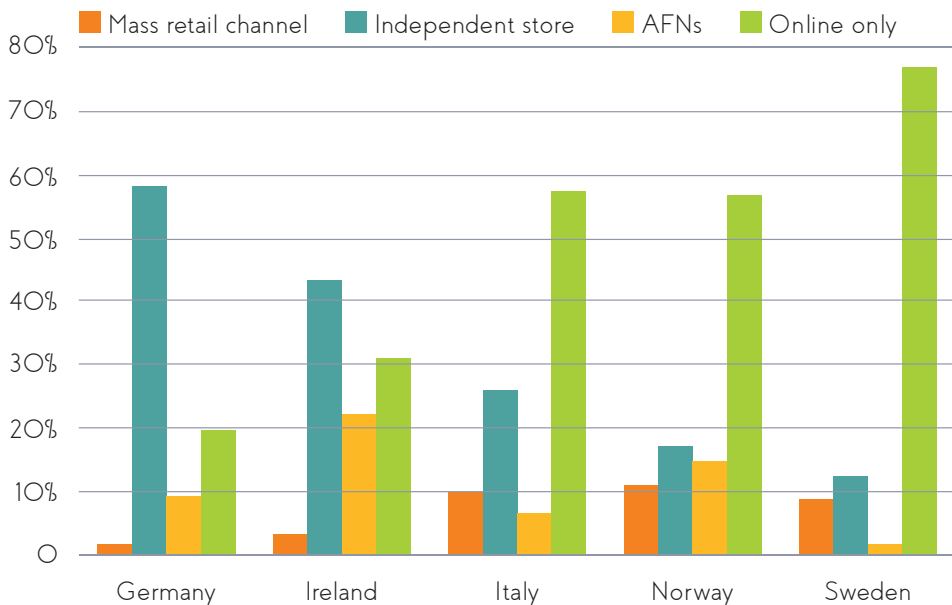


Figure 3. Percentage of of online food provisioning service typologies by country. N = 524

## 3.2 MARKET ORIENTATION AND GEOGRAPHICAL SCOPES

Moving to the market orientation of the OFPS, Figure 4 indicates that most often, OFPS in all countries operate in a business-to-consumer market, thus using the e-commerce to reach private customers. In a few cases, OFPS operate both in a B2C and B2B sector, for instance offering their food products both to consumers and to restaurants or catering organisation. A small percentage work solely on B2B and C2C sectors, though their presence as OFPS is overall negligible (1.9% for B2B and 1.15 for C2C).

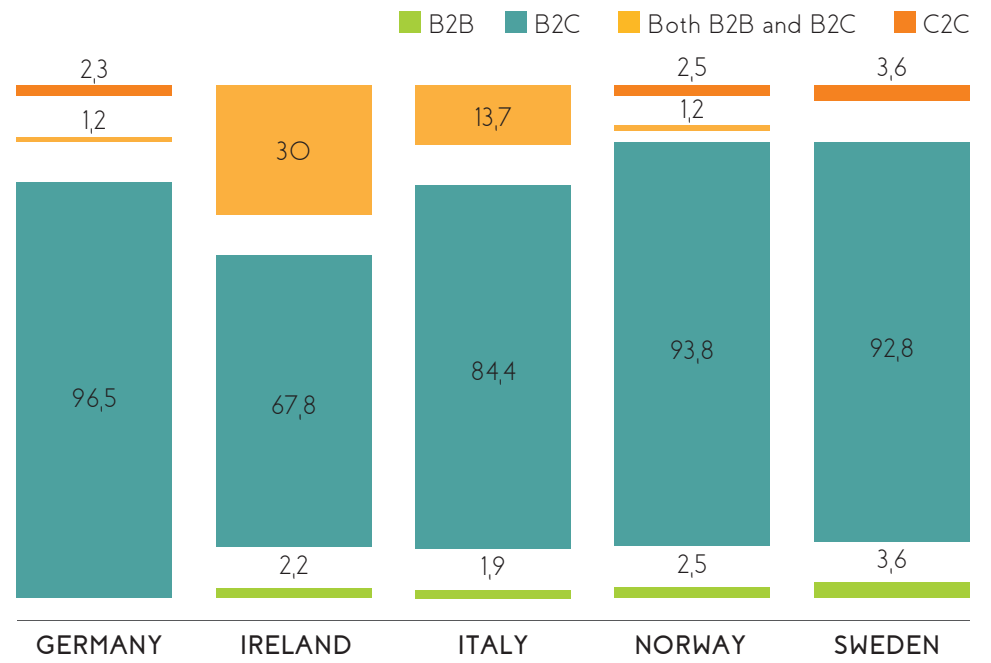
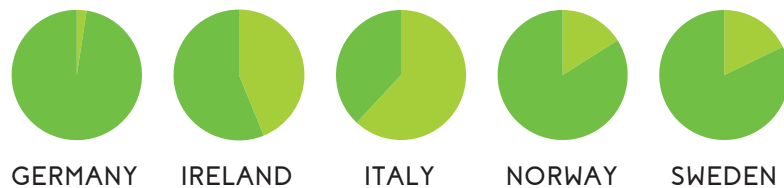


Figure 4. Commercial transactions of the online food provisioning service. N = 524.

Figure 5 and 6 show instead the market and the producers' geographical scopes. The former information refers to the shipment of products, and we distinguish between a local/regional scope - if products are only shipped

within a certain area - and a national/international scope - if products can be shipped throughout Italy, Europe or the world. For instance, some OFPS may decide to deliver food products only within a 30 km radius to decrease the environmental impact of their service. However, many OFPS usually ship their products all over the country or even internationally. Also in this case, countries differences are marked: Germany is the only country that has more OFPS shipping locally than nationally or internationally, followed by Sweden (53.6%) Norway (63%) and Ireland (77.8%). Almost all (91%) Italian OFPS operate on a national/international market scope.

Conversely, the producers' geographical scope gives us information on whether the food products sold, are produced locally - i.e. the products has an identifiable location on the region of origin - or nationally/internationally - i.e. the products have brands which do not connect them to precise sites of productions or are produced abroad. In general, all countries OFPS sell local products, a trend which is in line with the renewed attention towards culinary and artisanal traditions and gastro- regionalism<sup>3</sup> This percentage is particularly high in Italy, where almost all OFPS sell at least some products from local producers (only 14.8% of the OFPS have all producers with a national/international scope) and many OFPS are solely dedicated to the sale of local products (61.9%).



	GERMANY	IRELAND	ITALY	NORWAY	SWEDEN
Local	57	22,2	9	37	46,4
National/International	43	77,8	91	63	53,6

Figure 5. Market geographical scope of online food provisioning service by country

3 See DeSoucey, M. (2010). Gastronationalism: Food traditions and authenticity politics in the European Union. *American Sociological Review*, 75(3), 432-455 and Lelieveldt, H. (2017). Comment on DeSoucey: Gastronationalism or Gastroregionalism? Available at SSRN: <https://ssrn.com/abstract=2984754>.

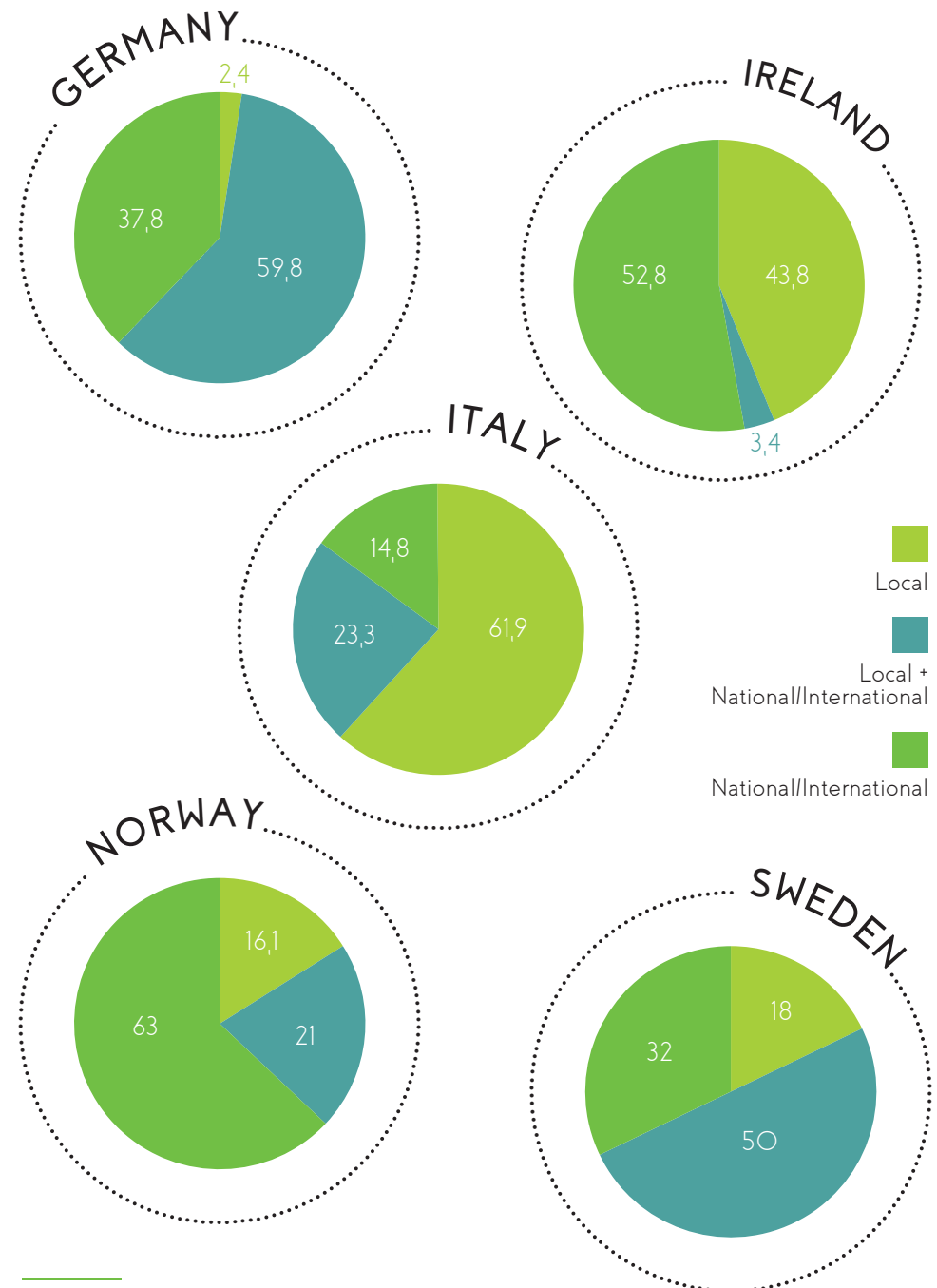


Figure 6. Producers geographical scope by country. N = 518, 6 'not reported'.

# 4

## FOOD PROVISIONING AND VALUE COMMITMENTS

Another relevant set of information gathered in the dataset concerns the value commitment of the OFPS as presented in the website. Part of the content analysis looked at 6 different values spheres that could possibly be part of the OFPS organisation. Each coder analysed the webpage to decide whether the OFPS website contained (yes = 1) or not (no = 0) statements about the following areas of concerns:

1. Statements about local food: whether the OFPS promotes and sells food products that come from specific local areas:
2. Statements about wellbeing: whether the OFPS declares that the food sold aims at improving consumers' wellbeing and health:
3. Statements about environment: whether the OFPS states that the organisation is committed to ecological and environmental values in any possible form:
4. Statements about equity: whether the OFPS states that the organisation values and promotes good working conditions for its employees or for the producers involved in the commercial transactions:
5. Statements about food and nutrient needs: whether the OFPS has sections in the website that help consumers with special food or nutrient needs (e.g. vegan, celiac, lactose intolerant) to find products:
6. Statements about food waste: whether the OFPS has specific concerns regarding food waste at any possible level of the commercial chain:

The first six columns in Figure 7 illustrate, for each commitment, the percentage of 'Yes'. The 'Mean of items sum' is instead the mean of the index constructed by summing the six value dimensions, and gives a measure of the total commitment level of the OFPS in each country. Interestingly, food waste is in all countries the less cited commitment. Italy has the lowest percentage of cases (6.6%), while Norway the highest (16.1%); in all cases, however, very few OFPS report any sort of commitment against food waste. Similarly, statements about equity are tendentially low in all countries but Norway. Commitments about local food are instead very common in both Germany (60.4%) and Italy (67.7%), a result in line with what we have already seen for the geographical scope of producers. Statements about wellbeing are relatively high in both Ireland and Norway: slightly

more than half OFPS present this value in their websites, against around 20% of all the other countries. A commitment toward the environment is instead high in Germany (58.1%) and Sweden (50%), followed by Norway (42.0%), Ireland (36.7%) and Italy (21.8%). Finally, around half of OFPS in Germany and Ireland, and around 2/3 in Norway have specific proposal for consumers with special food or nutrient needs: this value is instead rarely present in both Italy (31.8%) and Sweden (25.0%).

Finally, the mean of items sum gives us a general measure of the value commitments in each countries' OFPS. Higher values of the mean imply adhesion to more commitment from the OFPS in each country. Norway and Germany have the higher values, with respectively scores of 2.5 and 2.2. Ireland has a score of 1.9 while Italy and Sweden present the lowest scores.

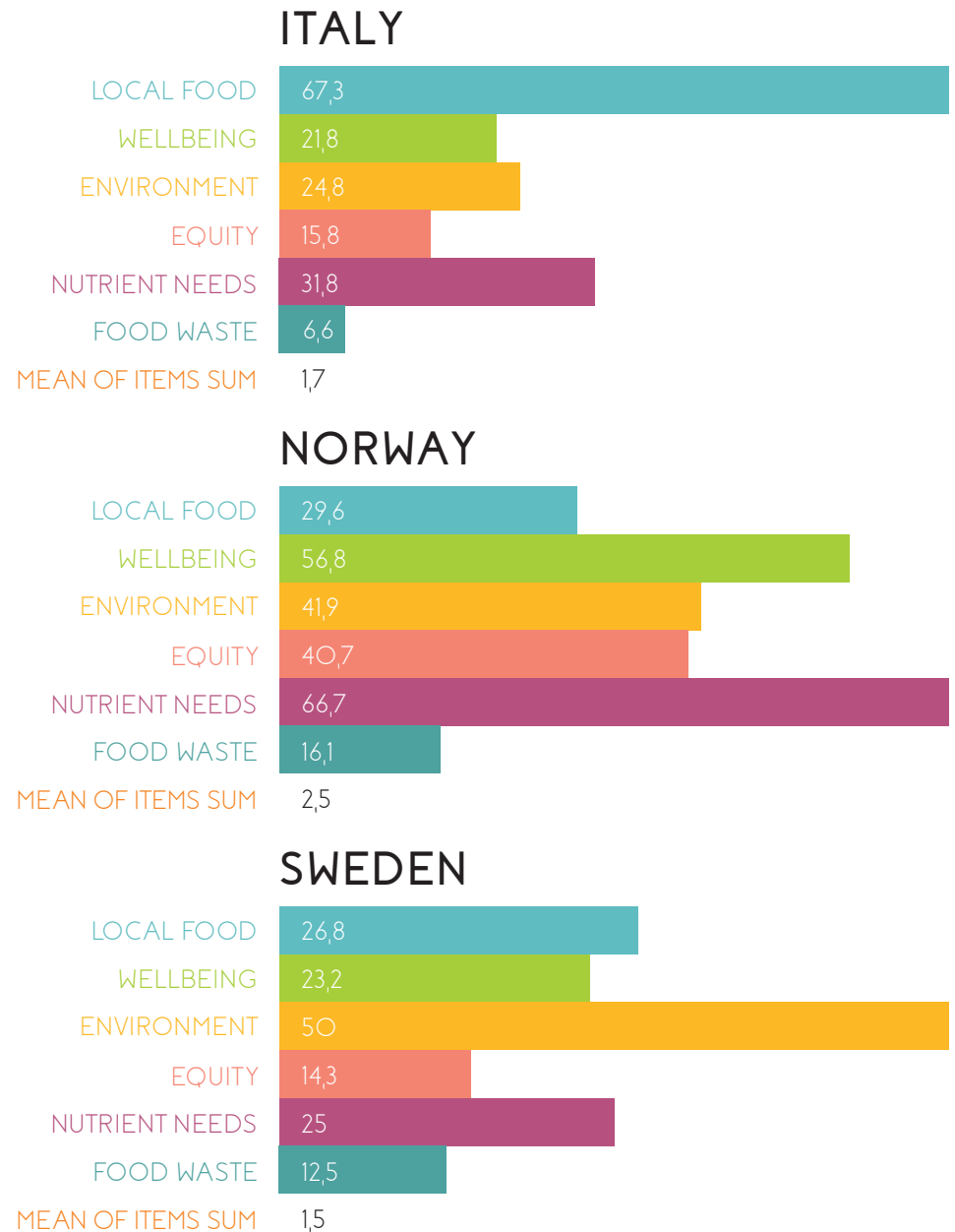
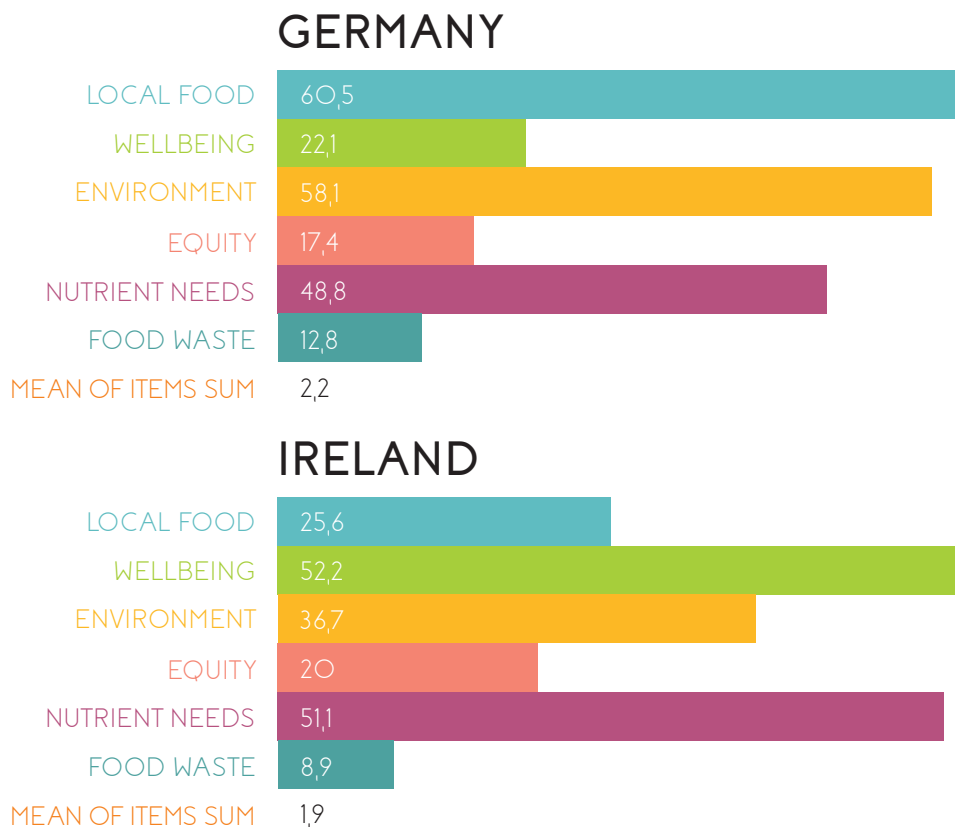


Figure 7. Presence of statements regarding local food, wellbeing, environment, equity, nutrient needs, food waste in the OFPS website by country. N = 524

# 5

## TYPE OF FOOD PRODUCTS SOLD

### 5.1. ORGANIC PRODUCTS

Another valuable information contained in the dataset regards the sale of organic products by the OFPS. Figure 8 shows differences in the OFPS as far as the presence of organic products is concerned. First, it is important to notice that in all countries, most OFPS have at least some organic products for sale. This percentage ranges from almost 54% in Ireland to 95.9% in Sweden. However, marked differences exist if we look at OFPS that exclusively sell only organic products: the 'pure' OFPS are more prevalent in Germany (60.2%), and much less common in all the other countries.

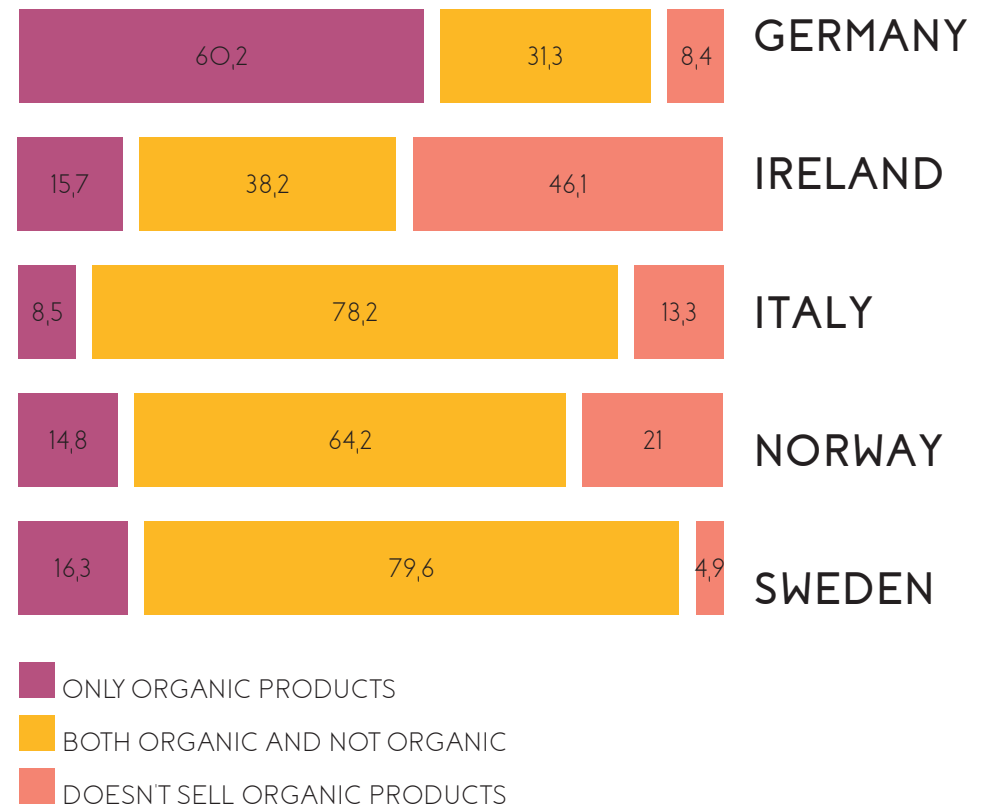


Figure 8. Sale of organic products in OFPS by country. N=513, 11 'Unclear' excluded.

## 5.2 TYPE OF FOOD SOLD: A LATENT CLASS ANALYSIS

Most importantly, the dataset contains fine-grained information on what kind of food the OFPS offer to consumers. To summarise this information, we applied Latent Class Analysis (LCA) to the set of items capturing the presence or not of 13 macro-categories of food on the full sample, as we do not have enough cases in each country. LCA is a statistical technique which allows to uncover hidden patterns of associations (the latent classes)<sup>4</sup> between observations collected in our dataset. To identify the optimal number of latent classes we use Bayesian and Akaike information criterion (BIC and AIC), the log-likelihood and theoretical interpretation of the result - lower values indicate a better fit of the model. The analysis, based on the full dataset (N=524), reveals the existence of 6 different classes (Table 1).

NUMBER OF CLASSES	N	LOG-LIKELIHOOD	DF	AIC	BIC
1	524	-41,785,865	13	83,831,731	84,385,724
2	524	-34,640,346	27	69,820,691	70,971,294
3	524	-31,036,647	41	62,893,293	64,640,505
4	524	-29,964,394	55	61,028,789	63,372,609
5	524	-28,984,167	69	59,348,335	62,288,764
6	524	-28,364,144	79	58,308,288	61,674,867
7	524	-28,358,751	88	58,477,502	62,227,614

Table 1. Goodness of fit indices for choosing the number of latent classes. N = 524.

<sup>4</sup> Vermunt, J. K., & Magidson, J. (2004). Latent class analysis. The sage encyclopedia of social sciences research methods, 2, 549-553.

FOOD CATEGORY	VEG AND FRUIT	NON-FRESH	READY MADE	PRESERVES	FRESH	ALL PRODUCTS
Bakery	0,038	0,4	0,173	0,547	0,611	0,992
Cereals	0,186	0,846	0,185	0,904	0,811	1
Fresh meat	0	0,012	0,421	0,12	0,827	0,87
Fresh fish	0,021	0,015	0,164	0,047	0,555	0,613
Fruit	0,883	0,03	0	0,042	0,943	0,994
VegeFigures	0,957	0,018	0	0	1	1
Alcoholic	0,048	0,418	0	0,849	0,184	0,86
Non Alcoholic	0,19	0,737	0,095	0,655	0,506	0,974
Preserves	0,108	0,86	0,24	0,972	0,812	1
Snacks	0,083	0,93	0,309	1	0,284	1
Cured meat	0	0,032	0,052	0,985	0,045	0,956
Dairy	0,114	0,26	0,214	0,933	0,857	0,984
Ready made	0,038	0,233	0,602	0,202	0	0,821
Class Size	5,15	30,53	8,97	23,28	7,25	24,81

Table 2. Latent classes and marginal predicted means of each food item by latent class. N = 524. Colours based on conditional formatting of centiles. N=524

To interpret the substantial meaning of each class, Table 2 shows the marginal predicted means of the 13 food categories within each of the 6 latent classes and the size of each class.

1. 'Veg and Fruit' is the smallest class (5.1%) and comprises the OFPS dedicated to the sale of fresh agricultural products:
2. 'Non-fresh', the biggest class (30.5%), includes the OFPS dedicated to the sale of long keeping packed products but not alcoholic drinks:
3. 'Ready-made' (8.9%) takes its name from the only item that has a higher probability of endorsing the class, compared to the all other ones but the 'All products' class:
4. Vermunt, J. K., & Magidson, J. (2004). Latent class analysis. The sage

encyclopedia of social sciences research methods, 2, 549-553.

5. 'Preserves' (23.3%) differs from the 'Non-Fresh' class as it contains, long keeping packed products, also cured meat, dairy and alcoholic drinks. This class is substantially different, as OFPS need to pay attention to the cold chain in order to ship cured meat and dairy products:
6. The class named 'Fresh' (7.3%) could be instead be considered as an extension of the first one, as it contains, besides fruit and vegetables, all sorts of fresh products with a short expiration date:
7. Finally, the class 'All products' (24.8%) contains OFPS that have the most heterogeneous provisioning of food products, as all items have a high probability of endorsing the class.

To throw further light on the 6 latent classes, Figure 9 below shows the percentage of each class by type of provisioning services. The Alternative Food Networks have the highest proportion of OFPS selling only Veg & Fruit (29.1%) and Fresh (18.2%): this is in line with many AFNs' aim to shorten the supply chain by connecting producers with consumers: Independent stores and Online only are somewhat similar, and present a higher proportion of OFPS selling Non-fresh and Preserves: this is not surprising, as they might face similar obstacles in managing fresh products with short expiration date, as these shops usually ship their products nationally and internationally: finally, the mass retail channel typology presents the highest proportion of OFPS falling in the 'All products' class. As a matter of fact, the mass retail channel online supply can count on the vast food assortment of the brick-and-mortar stores and on the geographic diffusion that ease both food home delivery and pick-up services.

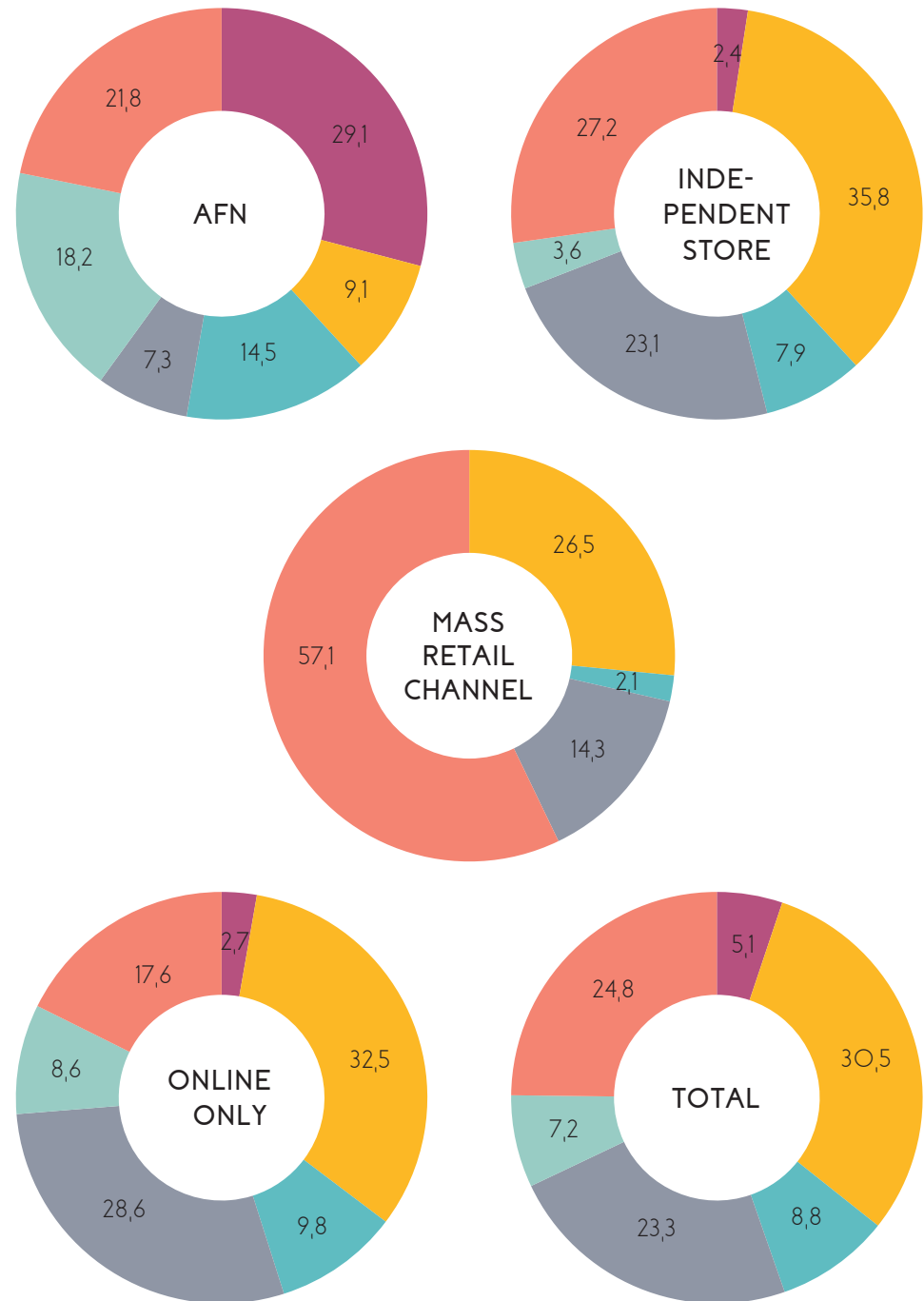


Figure 9. Proportion of each Latent Class by typology of store. N = 524.



# PIPELINE OR PLATFORM?

As discussed in the methodological section, a fundamental distinction in the dataset is between pipelines and platforms. These two forms of business are fundamentally diverse: the former gathers together more traditional e-commerce typologies. In general terms, pipelines might be seen as digital versions of pre-existing, brick-and-mortar types of businesses. For instance, the owners of a small boutique store in the city centre may decide to open a website so as to increase the market reach of their products. Similarly, many mass retail channels in all countries now allow consumers to do the grocery shopping online, by simply mirroring the products available in the supermarket shelves on their websites. Platforms are instead the by-product of most recent digital innovations, and they almost exclusively act as intermediaries between producers (or shop owners) and consumers. Their ultimate aim is to provide a service that facilitate providers and consumers to find a match. Their role is therefore to facilitate the connection between the two parts by offering a tool - the platform, while extracting out value from the transaction. This might be also suggested by the higher score reported on the index of digital presence, 3 vs 2.7 of pipelines<sup>5</sup>. Table 3 below shows the main differences between pipelines and platforms. In this case, given the small number of total platforms per country (see Figure 10), we present the results for the pooled dataset. In fact, as the first row illustrates, the vast majority of OFPS are pipelines, while slightly less than 10% of the cases are platforms. Differences in the type of food provisioning service just confirm the peculiarity of the platform business, which is present just in the online-only and in the AFN typologies. By definition in fact, the mass retail channel and the independent stores are digital mirrors of the brick-and-mortar stores.

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<sup>5</sup> The index, ranging from 0 to 8, is simply the result of the sum of the dummies measuring whether the FPS has (1) or not (0) the following digital tools or social networks profiles: native app, Facebook, Twitter, Snapchat, Instagram, Pinterest, Google +, WhatsApp, Telegram, YouTube



	%		N	
	PIPELINE	PLATFORM	PIPELINE	PLATFORM
<b>Total cases</b>	90	10	472	52
<b>Type of provisioning service</b>				
Mass retail channel	10,4	0	49	0
Independent store	35	0	165	0
Online only	47,1	63,5	222	33
AFN	7,6	36,5	36	19
<b>Market geographical scope</b>				
Local	25,2	48,1	119	25
National/International	74,8	51,9	353	27
<b>Producers' geographical scope*</b>				
Local	33,5	75,5	157	37
Local + National/International	29	20,4	136	10
National/International	37,5	4,1	176	2
<b>Market * Producers scope</b>				
Local and Local	6,6	38,8	31	19
Other	93,4	61,2	438	30
<b>Digital presence</b>				
Mean of items sum	2,7	3	472	52
<b>Organic food</b>				
Doesn't sell certified	18,9	11,5	89	6
Sells both organic and not organic	58,9	73,1	278	38
Sells only certified	20,9	5,8	99	3
Unclear	1,3	9,6	6	5

	%		N	
	PIPELINE	PLATFORM	PIPELINE	PLATFORM
<b>Certified food production standards</b>				
Explicit	33,1	21,2	156	11
<b>Quantity of Food Sold</b>				
Mean of digital items sum	6,8	8,6	472	52
<b>Latent Classes</b>				
Veg & Fruit	4,2	13,4	20	7
Non-fresh	33,7	1,9	159	1
Ready made	9,1	7,7	43	4
Preserves	23,7	19,2	112	10
Fresh	6,8	11,5	32	6
All products	22,5	46,2	106	24
<b>Commitments toward</b>				
Local Food	45,9	75	217	39
Wellbeing	33,5	25	158	13
Environment	36,9	42,3	174	22
Equity	18,6	34,6	88	18
Nutrient needs	44,7	23,1	211	12
Food waste	8,5	25	40	13
Mean of commitments sum	1,9	2,2	472	52

Table 3. Differences between pipelines and platforms. N= 524; \*N = 518, 6 'not reported'.

Moving to market and producers' geographical scope, it is interesting to notice that platforms are more concerned with local scopes on both sides. On the one hand, a higher percentage of Platform OFPS do not ship nationally or internationally: this may signal the socio-ecological embeddedness of food provisioning platforms and their commitment towards more

sustainable supply chain (e.g. km O) and towards emphasizing the value of social (food) relations among platforms actors: on the other hand, 75% of platforms have only local producers as food suppliers, a signal which is in line with the intermediary logic of the business. As Uber drivers can sign up to the service and 'start driving' almost immediately, producers face less barriers to enter the market, as they can (more or less) simply 'start selling' their products through the platform. Importantly, the crosstab between the two geographical scopes further suggests that a shorter food supply chain is a singularity of platforms. The variable 'Market \* Producers' scope' distinguishes between those OFPS that have local producers and that ship locally 'local and local' and all the other ones. Although the majority of OFPS fall in the residual categories, 38.8% of the platforms, compared to 6.6% of pipelines, opt for this combination.

Moving to type of food sold, it is first interesting to notice that very few platforms (5.8%) sell only certified organic products, while among pipelines this amounts to 20.1%. This could be the result of the different protocols adopted: while the latter can decide to acquire only organic food products from selected, platforms may be in principle 'open' to all sorts of food suppliers. In fact, explicit production standard protocols are slightly more common among pipelines (33.1% vs 21.2 %).

The latent classes above can now be useful to see more closely differences in the food products sold by pipelines and platforms. In line with the results on the geographical scopes, platforms are more prevalent than pipelines in the two classes with 'fresh' products (Veg & Fruit and Fresh). Moreover, they are more than double in the class called 'All products': as we have seen, among pipelines this class is prevalent in the mass retail channel: yet it is likely that acting as a third-part in the economic transaction helps platform to extend the supply of food categories. In principle, once the platform is set up, all sorts of food producers could join to sell their products, without the additional burden in terms of storage which may instead affect traditional pipelines.

Finally, the last point concerns the differences in value commitments. In general, platforms have a higher score on the index derived from the sum of the 6 commitments. If we look at the disaggregated data, we can how-

ever see some noticeable differences that may signal a diverse value positioning of the two business formats: although in all cases but one less than half OFPS are committed to any of the 6 values, platforms report more often a commitment towards local food (75% vs 46%), equity (36.6% vs 18.6%), and food waste (25% vs 8.5%); conversely, pipelines more often present statements regarding wellbeing (33.5% vs 25%) and attention towards food and nutrient needs (44.7% vs 23.1%).

## GERMANY



## IRELAND



## ITALY



## NORWAY



## SWEDEN



Figure 10. Number of pipelines and platforms by country. N = 524.

# 7

## CONCLUDING REMARKS

The present report aimed to summarise some of the most relevant information gathered using a unique dataset on online food provisioning services (OFPS) active in Germany, Ireland, Italy, Norway and Sweden. The dataset is the result of the content analysis carried out by one coder per country on a list of websites as close as possible to the country population of OFPS active in the food e-commerce between December 2018 and April 2019. It is important to underline that for this reason, most of the non-factual information (i.e. value commitments) should be interpreted as strategies of business presentation, rather than de facto involvement in those areas of concern. In general, the content-analysis of the websites has some drawbacks: for instance, in many countries it is not possible to gather information on the number of employees, on the registered consumers or producers, and most importantly on the turnover. This information, while not secreted in Norway and Sweden, it is almost never reported in the websites of the OFPS in other countries, thus making impossible to evaluate the market size of the OFPS under observation. Nonetheless, the same information gathered through a survey on OFPS owners would have probably resulted in a large non-response rate, consequently changing the nature of the problem, but not the problem itself. In addition, the fact that many OFPS are not forced to report the annual turnover could indicate that in these countries more efforts should be carried out to ensure economic transparency towards users.

In the first part of the report, we looked at cross-national differences on the set of information that are available in all countries. Overall, food e-commerce seems very differently organised in the 5 countries. Apart from the almost obvious finding that OFPS are almost exclusively directed towards a B2C market, marked differences exist and are difficult to interpret at present. Starting with the absolute number of cases, it is interesting to notice that in proportion to their population, Norway and Ireland seem to present a very active food e-commerce, while Germany, despite having more than 80 million residents, has a much smaller number of OFPS. As for the platform/pipeline divide, Italy,

Norway and Sweden have the highest percentage of platforms (between 13% and 14%), while in the other countries it is still very uncommon to find digital intermediaries that aim to differentiate their business proposal from the traditional pipeline form. The total number of platforms is still very low (52) which could suggest to further look at the specific cases with different methodologies, so to throw light on what could be hindering or facilitating the emergence of food platforms in some contexts.

Some considerations over the platform vs pipeline divide are however possible if we take into consideration the pooled sample. Although these results should be taken with caution, three general conclusions are in order: first, platforms seem to be more 'fresh' or 'innovative': not only they seem more digitally active (as a fact, they live almost 'exclusively' online), but they are also conceptually different to more traditional companies in the mass retail channel and to the independent stores. Second, platforms appear to be more inclined towards the 'local' dimension compared to pipelines. This result makes particularly sense, as by acting as intermediaries they more easily involve local producers and local consumers in specific areas. For more traditional forms of e-commerce, the digital is the means to reach customers everywhere at any time: for platforms, it is the scaffolding to connect consumers and producers by cutting out one side of the supply chain. Third, since their marketplace can be seen as a 'digital warehouse', they can more easily offer a wider supply of food products compared to most pipelines, with the exception of the mass retail channel. This is particularly relevant, as if grocery shopping will go more and more online, the capacity to offer the widest variety of food items might end up being one of the decisive factors in the rise or failure of food platforms.

# LIST OF INNOVATIVE PRACTICES

## GERMANY

In Germany, 4 innovative digital platforms have been identified from the WP1 mapping.

Two of these are consumer driven (Marktschwärmer and Food Sharing) and two are business driven (Hello Fresh and Märkische Kiste).

The first platform Marktschwärmer (former 'Food Assembly') and the second Food Sharing use online services to communicate and to plan food distribution, yet they still follow and practice principles in line with Alternative Food Networks (AFNs). Both are community organized and the food is directly distributed (by farmers or community managers) and consumers can meet and exchange on the platform as well as when they pick up the food. Thus, both platforms build short supply chains and reconfigure food production, distribution and consumption practices.

The third platform is business driven and is called Hello Fresh. It is a meal box that delivers all ingredients and recipes to the consumers door. Märkische Kiste is also business driven and offers organic fruit and vegetable boxes delivered directly to the homes of the consumers. These two platforms have been chosen as cases as a significant part of food related care work within households is being externalised.

### Brief description of 'innovative' digital platforms

**MARKTSCHWÄRMER ("MARKET REVELERS")** [www.marktschwaermer.de](http://www.marktschwaermer.de)  
Marktschwärmer is a community organized food market selling local products. It was launched in France and started in Germany in 2014. Consumers place weekly orders online, pay upfront and then pick up their order. Consumers pick up their products at local distribution points where they can also meet the producers. There are currently 18 assemblies in Berlin. These assemblies are run by one or two people who organize the ordering and distribution process. They often initiated the assemblies in the first place and are paid for that work.

## FOOD SHARING [www.foodsharing.de](http://www.foodsharing.de)

Foodsharing is a volunteer-run, self-managed organization founded in 2012 that rescues surplus food through an online platform. Before becoming a member - a food saver - one has to take an online test. The members then use the online platform to coordinate the food rescue and food sharing activities. They go to different places, e.g. bakeries, supermarkets, hotels, and pick up products that would otherwise be thrown away. The members are then responsible for the distribution of the food, either personally with friends, family, shelters etc. or in one of the 25 public fridges in Berlin.

## MÄRKISCHE KISTE [www.maerkischekiste.de](http://www.maerkischekiste.de)

Märkische Kiste is an online organic food box scheme for the Berlin area. Consumers can put together boxes individually or choose between pre-composed boxes, e.g. with local produce, the 'mix box' with global fruit and vegetables or a 'cheese box'. There are three different sizes: small, medium and large. The delivery rhythm (weekly, biweekly, monthly) is organized around weekdays but can be adjusted individually and paused if necessary. Additionally there is an online shop with commercial partners for other products that can be added to the boxes. Märkische Kiste delivers to individual households, offices and schools/kindergartens.

## HELLO FRESH [www.hellofresh.de](http://www.hellofresh.de)

Hello Fresh is a meal box, delivering fresh food and step-by-step recipe cards to consumers. The meal kit consists of recipes with the exact amount of food items needed, like vegetables or seasoning. In this way food waste should be reduced. The weekly orders are made through the website or the app, and are then delivered to the home. Consumers can pick between a vegetarian, a classic or a family box and are able to change their orders on a weekly basis. The sizes of the boxes vary depending on the number of persons (two to four) or dishes (three to five). According to the platform the preparation of the meal takes up to 30 minutes.

## IRELAND

In Ireland, 2 innovative digital platforms have been identified among the online provisioning systems mapped in WP1.

Both platforms offer a centralised IT service to facilitate transactions between suppliers and consumers. The first platform, Buymie, is a form of 'personal shopper' service and takes responsibility for the delivery of the food items to the customer's home. The second platform, Neighbourfood, is not responsible for the delivery of the food items rather, customers need to travel to a 'host' space to collect their purchases directly from producers. Conventional and alternative food provisioning characteristics can be distinguishable between the two platforms, respectively. Buymie gives its users experience similar to the physical mainstream supermarket shopping from the convenience of their homes/office besides extra service value with rapid delivery turnaround services. Neighbour food, on the other hand, focuses on promoting local food consumption and enable local producers to access the market via a virtual outlet to exclude intermediaries and directly reach their customers.

### Brief description of 'innovative' digital platforms

#### BUYMIE <https://buymie.eu>

This platform is an online delivery service for on-demand groceries in Dublin city only. It allows the user/consumer to place an online order of groceries from any mainstream retail supermarket or other food suppliers registered with the service.

Buymie differs from traditional online delivery services in its rapid turnaround, which varies from 1-hour premium slot to 3 hours delivery slot for a fixed fee, compared to longer delivery service times offered by the large retail multiples, Tesco and Supervalu. The platform retail partners pay the platform a monthly subscription. The platform, through partnerships with some retail stores (about 20% of total 50 stores registered on the app), has access to live store pricing and special offers. The pricing with other non-partner retailers are mapped

manually. The platform itself organizes the grocery pickup and delivery via a personal shopper. Interestingly, Buymie offers online service delivery from retail channels that do not currently offer online purchasing for food, including discounters Aldi and Lidl and family-owned grocery store Dunnes.

#### **NEIGHBOURFOOD** [www.neighbourfood.ie](http://www.neighbourfood.ie)

This platform offers a centralized IT service to facilitate the creation of a online local marketplace that bring local and artisanal producers closer to consumers, making a wide range of premium and speciality produce more directly accessible via one digital market space.

Neighbour food platform resembles the alternative food networks characteristics, in terms of the scale of production, supply chain systems, and ethos embedded within the business operation. Neighbour food platform's mission is to support local food producers and build a closer local community around food by connecting local food producers directly with consumers. The platform does not select the producers: producers who meet the platform's sustainable practices profile are free to join the platform after being verified by the platform organizers. The Neighbour food has 33 local producers registered on its services in the Cork city area. These local producers vary from direct sale farms selling fruit, veggie, and honey to butchers, coffee roasters, cheesemongers, and other producers specializing in artisanal food products. Some of these producers have physical and online retail space beside the platform market outlet (e.g., On the pigs back, soma, Izzy, Nash 19, Elbow lane, My Goodness).

Producers have full autonomy of product offering from the point of order to the end of the sale. The platform charge producers a fixed fee of total sales for getting the market up and running and for the ongoing maintenance and development of the website. The venue for drop off and collection is not organized by the platform but rather by a host of several venues who sign up online to start running weekly collection points. These hosts are responsible for organizing social events at the collection point to build a sense of community around good food. Consumers can pre-order and collect their orders at the chosen local venue, where they can have a chance to meet the local farmers and food makers who supply the produce.

## ITALY

In Italy, 8 innovative digital platforms have been identified among those mapped in WPI.

Three of them (Cortilia: Tastē gusto Italiano: Local to you) consist of platforms that allow consumer to order online and then to receive their orders via home delivery services. This platform model enables to shorten the food chain in the attempt to make distribution more efficient. It is also amenable to an ecologically and socially conscious choice of producers on the basis of their practices - although this is ultimately up to the platform itself. Local producers are generally favoured, although there might also be products available from non-local ones. Such platforms operate mainly (but not solely) through home delivery box scheme. In terms of structure and functioning, this model mixes, to 'traditional' business models (i.e. oriented to profit) while endorsing (or pretending to do so) the ethical values of AFNs. In fact, this model does not create relations among consumers, nor between consumers and producers.

Other three (L'Alveare che dice sì: VipOrto: Mangio a Km0) consist of platforms that offer a centralized IT service to facilitate the creation of a local community marketplace where, alongside market exchange, physical interaction between local producers and costumers takes place. This platform model represents a form of 'light' intermediation, which is able to exploit the capacity of the internet of cutting out the middleman in the supply chain by connecting directly consumers with producers. Orders and payments are made online through the website, with no obligation on the consumers. Yet, producers are not actively selected by anyone: they choose to become part of the platform and offer whatever they have available. Differently to type 1, it is not the platform itself that takes care of the physical delivery. In this model either consumers nor produces need to associate actively, as it is the platform itself that brings them together.

The remaining two (Agrifoodie, Gasgos) are online food platforms based on user-centric purchase system that are based on collective group buying. Here, orders are effectively placed only once the aggregated demand for one specific product reaches a critical threshold. This allows to make the delivery more efficient both in terms of energy and time - for producers particularly.

This model is very similar to the way Italian GAS (Solidarity Purchasing Groups) work, for they are made of groups of consumers that place collective orders to selected producers so as to make the buying more advantageous and environmentally sustainable. The personal interaction that characterises GAS seems nonetheless to be less relevant to the use of this kind of platforms.

### **Brief description of 'innovative' digital platforms**

#### **CORTILIA [www.cortilia.it](http://www.cortilia.it)**

Cortilia S.p.A. is a Milan-based platform that was founded in 2011 as a start-up aiming at applying IT innovations to the food complex. The company chooses artisanal, small-to-medium, producers in the area of Lombardy, Piedmont and Emilia-Romagna (today, they are 200) - assuring that the standards of quality are met. Prospective consumers find products online and the company delivers them directly to the houses in refrigerated vans. The products delivered are local. Quality and freshness are the keywords for this company that has been growing steadily and now counts 300,000 subscriptions to the website and a revenue of 4,200,000 euros in 2016.

#### **ALVEARE CHE DICE SÌ <https://alvearechedicesi.it>**

Alveare che dice sì (translated: The yes-saying beehive) S.p.A. is an international company founded in 2011 by an Italian engineer based in France. It has arrived to Italy in 2015 and today there are more than 150 alveari in Italy, with over 100.000 subscribers to the website and one physical shop opening in Milan. The platform has also had great success throughout Europe, mostly in France, Netherlands and more recently in Germany.

The platform is articulated in several Alveari, hubs run by local managers, where once a week producers bring grocery and consumers collect their shopping - previously chosen and paid online. Differently from Cortilia, the company's mission more explicitly incorporates the discourses that have dominated political and critical consumerism around food in the last decades, emphasising the importance of healthy and sustainable food not only for the consumer but also for the producers. The key words in this respect are: fair, direct, local, pleasure, community, transition, web, diversity and freedom.

#### **TASTÉ [www.tastegustoitaliano.it](http://www.tastegustoitaliano.it)**

This is a private start-up set up in Piedmont in 2015 with the aim of connecting local producers to consumers, especially in the city. Orders are set through the platform that then forwards them to the producers. The latter prepare the orders that are then collected and delivered by the platform.

Local To You (<https://www.localtoyou.it/>).

Local to you s.r.l. It is a social enterprise that was born from a number of cooperatives in Emilia Romagna in 2016, who gathered to be able to provide a more efficient service for consumers (individual, GAS and restaurants) also via the use of IT. In this case, not only the associated cooperatives but also other local producers send produce to the local hub. Once orders are received via the platform, boxes are set and sent to the consumers through home delivery box scheme.

#### **VIPORTO <http://viporto.it>**

is a project, financed by Region Puglia in 2017, in which a platform connects consumers and producers via the means of storytelling: producers present themselves through videos, consumers can choose whom to buy from. Orders are placed online and then delivered by a network of affiliated deliverers - potentially throughout Italy.

#### **MANGIO A KMO [www.mangioakmo.it](http://www.mangioakmo.it)**

is an 'online market' set up in 2018 where consumers can choose close producers who show their products online. Orders are placed through the platform and sent to consumers.



### **AGRIFOODIE** [www.agrifoodie.it](http://www.agrifoodie.it)

is born from a EU funded project in 2018. Its aim is to provide the technological means for purchasing groups to easily place their orders to producers. Compared to the other platforms, this seems geared towards the creation of networks of consumers much in the image of GAS.

### **GASGOS** [www.gasgos.it](http://www.gasgos.it)

consists of the online 'windows' of existing GAS (Solidarity Purchasing Group) established in 2016 to facilitate access to the products by groups of self-organized consumers. In this case, it is not directly the online platform that produces the mediation between producers and consumers: this is something that is carried out by the components of the purchasing group themselves and yet embody the values and practices of sustainability that are at the core of grassroots AFNs.

## NORWAY

In Norway, 3 innovative digital platforms have been identified among the online provisioning systems mapped in WP1.

Two of these are Alternative Food Networks (Reko-ring and TooGoodToGo) and one is a box scheme (Adams Matkasse). Preliminary findings from the interviews conducted in WP2 in Norway suggest that consumers who use the latter box scheme also simultaneously use online mass retail solutions to complement the contents of the food box. Thus, this type of online mass retail platform is also covered through the case selection of Adams Matkasse.

All selected platforms enable consumers to connect with suppliers. All platforms represent digital innovations in the Norwegian food sector and have

a focus on local food, food miles, and seasonal food. Two platforms also have an additional focus on health and wellbeing, and nutrient needs. The platforms were also selected because they are relatively widespread in scope compared to the other online provisioning systems mapped in WP1 in Norway. TooGoodToGo, as an example, has 1831 restaurants and food shops selling their excess food to almost 100,000 independent users across the country.

### **Brief description of 'innovative' digital platforms**

#### **REKO-RING** [www.facebook.com/rekonorge](https://www.facebook.com/rekonorge)

Reko-ring is an AFN founded in 2018, functioning as an alternative distribution food channel intended to make it easier and more effective for producers to sell their local goods directly to consumers. There are several non-profit Reko-rings spread across Norway and all have a focus on distributing locally produced food without the intermediary stage between producer and consumer. Being an informal group network, all Reko-rings use social media (i.e., Facebook) as means of communication. Apart from a website and the Facebook page, the AFN has no app and little social media presence. The delivery form through Facebook is a click-and pick-up where producers issue available food and prices for the consumers to claim and consequently agree on a pick-up time and arrange meetups. The AFN mostly sells seasonal fruit and vegetables, but also occasionally other food categories such as flour, honey, meat, herbs, egg, and milk. Value is primarily added from high quality products and the service offer consumers both organic and non-organic products. Reko-ring has an explicit focus on local and seasonal food, reduced food miles, health and wellbeing on the consumer-level, and equity and fair farming on the producer-level.

#### **TOOGOODTOGO** <https://toogoodtogo.no/no>

TooGoodToGo is an online app distributing excess food from restaurants and grocery shops that is typically close to expiration date. The food is offered at highly reduced costs, ranging between 15-100 NOK per food portion, and so the value creation mainly comes from low prices. With

the exclusion of alcoholic drinks, TooGoodToGo offers both organic and non-organic products in all food categories mapped in WP1, including ready-made meals. The app's main aim is to reduce food waste in Norway and contribute to a more sustainable society. In Norway, the app was founded in 2019. The start-up location of the provisioning service is Oslo, but the app's service is currently available in several locations across the country, mainly larger cities such as Trondheim, Stavanger and Bergen. In addition to the platform's app and website, TooGoodToGo have an established presence on social media, namely through Facebook, Twitter and Instagram. The delivery service is click-and pick-up as the consumer is required to pick up the food in a selected time and place. Consequently, the app has a large focus on local food and reduced food miles, as well as environmental protection, food and nutrient needs and - above all - food waste.

#### **ADAMS MATKASSE** <https://adamsmatkasse.no>

Adams Matkasse is an online food box scheme. The enterprise was founded in 2010 in Oslo and is currently available on a national level in most urban and some rural areas. Adams Matkasse is available on the following digital platforms: Facebook, Instagram, Google+, Youtube, own blog, website, and app. Consumers are able to choose and even tailor their own food box intended to last a week. The food boxes are catered to fit different dietary needs such as a vegetarian-, lactose- or gluten-free diet. The service does not sell certified organic products and offer no drinks or ready-made meals. Instead, the boxes contain portioned ingredients and recipes needed to cook their own food. Adams Matkasse offer home delivery and the value creation mainly stems from high quality products. The marketing message of the enterprise focus on health and time-saving and it places an explicit emphasis on local and seasonal food, food miles, wellbeing and health, and nutrient needs.

## SWEDEN

In Sweden 3 innovative digital platforms have been identified among the online provisioning systems mapped in WP1

All three selected cases are marketed and positioned as alternative in relation to the mainstream food provisioning system and offer services built around sustainability and convenience. The first case selected is meal boxes. This case is interesting as it builds on service innovation and have managed to attract a large customer base by combining an internet platform with a logistics offering made to fit with current household practices and food consumption ideals. The second case is Rekoring. Drawing on the ideals of Alternative Food Networks the Rekoring can be described as a popular movement spread all over Sweden. Part of the success lies in the way the Rekoring-idea is relatively easily translated into loosely interlinked nodes of producers and consumers by making innovative use of already established digital, physical and social infrastructures. Lastly, the third case is the Karma App. The Karma app is an interesting case of market innovation where a digital platform is utilized to assemble a "new" market around products previously discarded by food outlets.

#### **Brief description of 'innovative' digital platforms**

##### **MEAL BOXES**

**Årstiderna** [www.arstiderna.com/valkommen](http://www.arstiderna.com/valkommen)

**Linasmatkasse** <https://linasmatkasse.se>

Meal boxes consist of food items, premeasured and at times pre-sliced, and accompanied by a set of recipes, which are delivered to the home. This service is organized and enabled digitally - typically involving both a webpage and a smartphone application - that allow consumers both to order and to change their orders on a weekly basis. The first meal boxes appeared on the Swedish market around 2008 and 2009. Since then the market has grown substantially. A large number of companies specializing in meal boxes has been established and most of the large food retailers like ICA,

COOP and others started to offer meal box services. Meal boxes are an interesting case of service innovation where combining digital platforms with logistics solutions. They offer consumers a convenient way to appropriate food that also support consumers in perusing a number of ideals linked to food and cooking. Meal boxes offer a way to conveniently accomplish a varied, healthy and often sustainable diet and allow consumers to 'cook from scratch'. Hence, meal boxes not only offer a means for provisioning but also specifically address everyday dilemmas of managing time and ideals in households.

#### REKO-RING:

**Rekoring Malmö** [www.facebook.com/groups/REKOMalmo/](https://www.facebook.com/groups/REKOMalmo/)

**Rekoring Lund** [www.facebook.com/groups/652752628264300/](https://www.facebook.com/groups/652752628264300/)

REKO is short for 'proper' or 'solid' (rejäll) consumption and the reko-ring phenomenon has repeatedly been described as a popular movement (folkrörelse) where producers and consumers in a municipality join together and trade various produce and foods without any intermediaries. The concept has its origins in Finland and the first Rekoring in Sweden started in the small municipality Grästorps in 2016. The movement has grown quickly since then and in September 2019 there were among 140-150 rings with 350 000 members (Hushållningssällskapet.se) spread all over Sweden. Reko-rings are formed using Facebook as a digital platform. Most rings are organised around two Facebook groups: one for producers linked to the ring and one gathering the consumers of the ring. The consumers group is also the site where producers offer their goods and consumers place orders. All orders are agreed upon before the goods trade hands at weekly or bi-weekly meetings, typically organised at a local parking lot. Typical foods traded at a Rekoring are, meat, seasonal fruits and vegetables, eggs, and honey. Rekorings are mainly marketed as a convenient way for consumers to shop for local and sustainable foods while at the same time supporting local small-scale farmers.

#### KARMA <https://karma.life>

Karma, is an online and smart phone app launched in Sweden in 2016. The aim, the company states, is to reduce food waste and promote sustainability. Karma provides a digital platform that enables restaurants, cafés, and food stores to sell unsold food, that would otherwise have to be discarded, at reduced cost. Foods typically traded are ready meals, bread and pastries. The platform is in use in 150 Swedish cities and towns, making it the largest food app in the country that focuses on sustainable consumption. At the time of writing, Karma claims to have over 500,000 users and to sell food from more than 2,000 restaurants, cafés and food stores. The app is free for consumers while Karma charge a small percentage of every sale of food businesses members. Unlike meal boxes and Rekorings, Karma does not directly address values like health, local or 'cooking from scratch'. Karma centres only on diminishing food waste by making foods previously on-sold sellable. The size and coverage of the app on the Swedish market makes it interesting as a case for studying how digital device innovations can potentially assemble and shape markets and change sustainable provisioning and consumption practices.

# METHODO- LOGICAL ANNEX

## A. UNIT OF ANALYSIS

In order to construct a dataset of all the OFPS active, in the first stage, coders ran a searches using search engines and keywords (see below) between December 2018 and February 2019.

In order to capture the OFPS that could potentially allow users to do on-line grocery shopping the following including and excluding criteria were applied:

### EXCLUDED

1. Online provisioning services selling food products of one brand only or from one producer only. You can recognize these websites as ALL products sold have the brand/logo on top of their products or the website is owned by a single producer.
2. Online provisioning services that deliver cooked meals from restaurants.

### INCLUDED

All pipelines and platforms selling at least 2 product categories and C2C provisioning services.

## B. DISTINCTION BETWEEN BRAND, CATEGORY AND PRODUCT

1. **BRAND**: an image that defines a product, or an array of products, which are made or packed by one producer. Example: Pasta Mancini: <https://shop.pastamancini.com/>. The producer makes the pasta, brands it and sells it via his website.

2. **CATEGORY**: a food category groups together food products that fall under the same conceptual umbrella. Since categories can change depending on the level of specification, it is important to define the food categories we are going to consider as worth of our attention. Thus far, our

food categories are the following ones (new ones have been introduced, some have been unpacked):

- Bakery (both fresh and packed, sweet and salty)
- Cereals (pasta, wheat, flour, rice, etc.)
- Meat (fresh)
- Fish (fresh)
- Fruit (fresh)
- VegeFigures (fresh)
- Alcoholic drinks
- Nonalcoholic drinks
- Preserves (in can, sugar, vinegar, oil, salt, or fat)
- Snacks/confectionary
- Cured meat
- Dairy products
- Ready-made meals

**3. PRODUCT:** a food product is a single identifiable item. Therefore we think of the cured meat category as containing several cured meat products (e.g. pork sausages, reindeer ham, jamon serrano etc.): or the dairy category as containing several milk-based products (e.g. sheep's milk cheese, yogurt, cow milk etc.). Depending on the provisioning service, products may be purchased one by one, or in a bundle (as for instance in the case of provisioning services selling vegeFigures and fruit box schemes.).

## C. CLASSIFICATION OF PIPELINES AND PLATFORMS

The distinction between platform and pipelines is of utmost importance for both theoretical and empirical reasons. It is important to clarify how to distinguish between the two in order to achieve consistency in the Platform database.

On the basis of the available literature and the practical experience acquired so far we now suggest the following definition (from Parket et al., 2016) and guidelines to recognise the difference between a platform and

a pipeline. We hope this might clear things up and help everyone select the appropriate response category.

**PIPELINE:** *'A business that employs a step-by-step arrangement for creating and transferring value, with producers at one end and consumers at the other. A firm first designs a product or service. Then the product is manufactured and offered for sale, or a system is put in place to deliver the service. Finally, a customer shows up and purchases the product or service.'* P.6

**1. PIPELINE:** Single sided market and traditional e-commerce. This is usually the most prevalent form of online food shopping. The provisioning service selects food products which are sold through the website to consumers. Producers do not get in contact with the consumers, nor rely in the provisional service as an intermediary. They may or may not be presented in the website.

In fact, the online order and the shipment are exclusive responsibility of the provisioning service. Pipelines do not allow producers to register to the website as producers, although it might be possible to find in the website a digital form (e.g. a contact link) that allows producers to signal themselves to the provisioning service.

**PLATFORM:** *'A business based on enabling value creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them. The platform's overarching purpose: to consummate matches among users and facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants.'* P.5

**2. PLATFORM:** two (or multi) sided market. Platforms act almost exclusively as intermediary between producers and consumers (B2C), consumers and consumers (C2C), producers and producers (B2B). The primary role of platforms is to facilitate the match between the two parts, by offering a web-space that allows the contact or the transaction between the two parts. The platform offers the two parts a tool (the platform) the get in contact and does not directly acquire products from the producers. However, the platform may be involved in the shipping and might actively select which

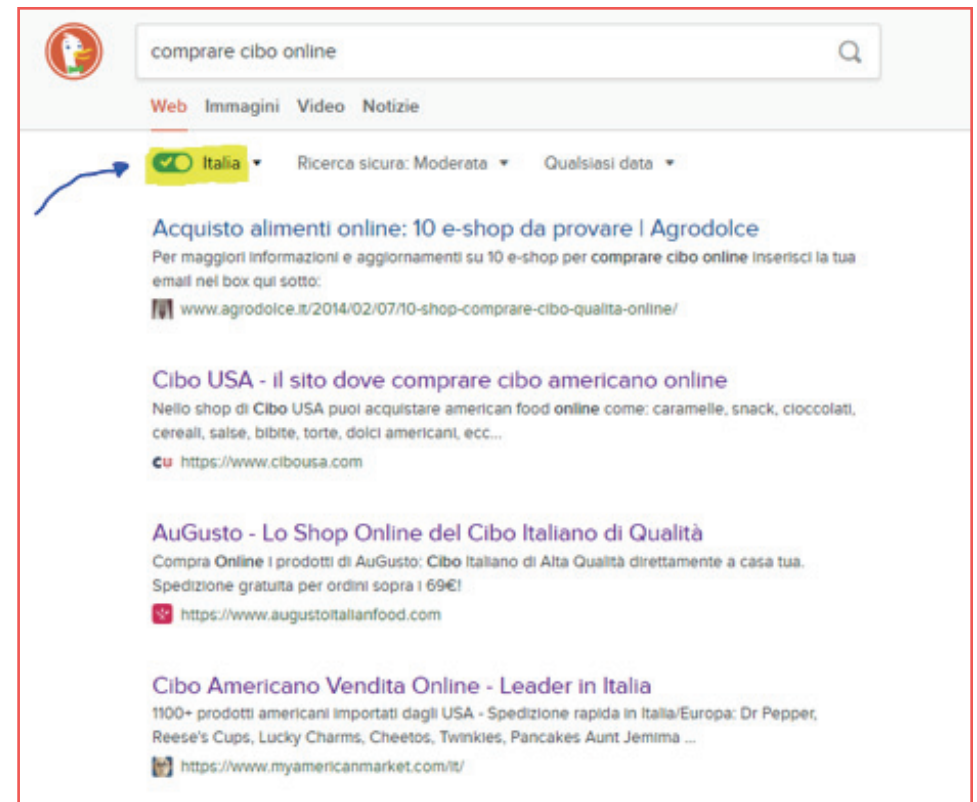
producers 'fit' the platform mission. A platform can be recognised and distinguished from a pipeline by the presence of at least one of the following characteristics:

- a. The website has two separate sections, one dedicated to producers and one dedicated to consumers (or other businesses, in the case of B2B platforms) where they can register in order to 'start selling' or 'start buying' food products.
- b. The website clearly states that the online orders are directly forwarded to the producers who have the responsibility to manage them.
- c. The website offers an online window to producers (usually in exchange of a monthly/annual fee), that are thus allowed to use the platform to sell their products to the consumers.
- d. The website offers to consumers (C2C) a service to get in contact in order to exchange or sell food products to each other

## D. SEARCH ENGINE

Using google as a search engine guarantees a deeper reach, as the algorithm can capture information others' cannot. Since we are interested to reach an analytical sample as close as possible to the actual population, google guarantees better results. However, it is necessary to repeat the search with another service that does not track users in order to validate the first search we have made. Please repeat the search using the service called Duckduckgo.com with the same keywords (see section 5). Remember to select your country before typing the key words (see figure below). As a formal rule, stop at page 50 in google or after 500 results in duckduckgo.com.

Just to be sure, an additional search on Google and Apple APPs market places with the same keywords, was performed, as some platforms might be present just as native applications and not appear on Google.



## E. KEYWORDS

The following keywords has been used in the search.

Online grocery shopping

- Online food shopping
- Grocery shopping online
- Box scheme
- Online food
- Organic food online shopping
- Food apps

After a first analysis to each keyword, it was also added the local areas in order to refine the search at the local level (e.g. Online shopping Trentino).

## F. INTER-CODER RELIABILITY TEST

All the coders involved in the project gathered to discuss the most ambiguous variables, which have been subsequently re-analysed on a separate dataset containing a random selection of 30 OFPS based in England. This choice allowed coders to analyse the reliability dataset in the only language that was comprehensible to all. Following the results of the reliability test, the average pairwise percent agreement, Fleiss' K and Krippendorff's K have been used to discard or simplify (i.e. reducing the number of response categories) the less reliable variables.

Some references on reliability:

- Lombard et al., 2002: Content analysis in mass communication
- Neuendorf, 2016: The content analysis guidebook

# CODEBOOK

## COUNTRY

Description: Country of the provisioning service

Guidelines for the coding: Select the country from the dropdown menu

Main issues: In very few cases (e.g. Amazon pantry), there might be multiple countries for a single provisioning service.

Solution: Select your country

Response categories:

- Italy
- Norway
- Sweden
- Germany
- Ireland

## ID

Description: Id of the provisioning service

Guidelines for the coding: Add progressive number

Open response

## NAME

Description: Name of the provisioning service

Guidelines for the coding: Add full name of the provisioning service

Open response

## WEBSITE LINK

Description: Link of the provisioning service website

Guidelines for the coding: Add the website link

Open response

## PIPELINE OR PLATFORM

Description (from Parker et al., 2016) 'Platform revolution':

**PIPELINE:** 'A business that employs a step-by-step arrangement for cre-



ating and transferring value, with producers at one end and consumers at the other. A firm first designs a product or service. Then the product is manufactured and offered for sale, or a system is put in place to deliver the service. Finally, a customer shows up and purchases the product or service.' P.6

**1. Pipeline:** Single sided market and traditional e-commerce. This is usually the most prevalent form of online food shopping. The provisioning service selects food products which are sold through the website to consumers. Producers do not get in contact with the consumers, nor rely in the provisional service as an intermediary. They may or may not be presented in the website.

In fact, the online order and the shipment are exclusive responsibility of the provisioning service. Pipelines do not allow producers to register to the website as producers, although it might be possible to find in the website a digital form (e.g. a contact link) that allows producers to signal themselves to the provisioning service.

**PLATFORM:** 'A business based on enabling value creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and sets governance conditions for them. The platform's overarching purpose: to consummate matches among users and facilitate the exchange of goods, services, or social currency, thereby enabling value creation for all participants.' P.5

**2. Platform:** two (or multi) sided market. Platforms act almost exclusively as intermediary between producers and consumers (B2C), consumers and consumers (C2C), producers and producers (B2B). The primary role of platforms is to facilitate the match between the two parts, by offering a web-space that allows the contact or the transaction between the two parts. The platform offers the two parts a tool (the platform) the get in contact and does not directly acquire products from the producers. However, the platform may be involved in the shipping and might actively select which producers 'fit' the platform mission. A platform can be recognised and distinguished from a pipeline by the presence of at least one of the following characteristics:

- The website has two separate sections, one dedicated to producers and

one dedicated to consumers (or other businesses, in the case of B2B platforms) where they can register in order to 'start selling' or 'start buying' food products.

- The website clearly states that the online orders are directly forwarded to the producers who have the responsibility to manage them.
- The website offers an online window to producers (usually in exchange of a monthly/annual fee), that are thus allowed to use the platform to sell their products to the consumers.
- The website helps consumers (C2C) to get in contact in order to exchange or sell food products.

Response categories:

1 Pipeline

2 Platform

## SHORT DESCRIPTION OF THE PROVISIONING SERVICE

Description: Short description of the provisioning service

Guidelines for the coding: Add a short description of the provisioning service in English

Open response

## TYPE OF PROVISIONING SERVICE

Description: Type of sale system of the provisioning service

Guidelines for the coding: Select between the following categories:

Response categories:

- Mass retail channel (general, specialised, discount)
- Independent Store (it needs to have a physical store - maximum of 3 stores)
- Online only (both mono and multi)
- Alternative food network/Direct sales (there needs to be reference to networks such as solidarity purchasing groups, or small associations of customers)

## BOX SCHEME

Description: The provisioning service has a plan that allows customers to receive groceries on a regular basis.

Guidelines for the coding: Select 'yes' only if this option is available on the website and it is clearly stated. To be a box scheme, the user must have the possibility to purchase a subscription that allows him to regularly (e.g. once a week; once a month) receive the food without having to order products from the website every time. Select 'no' if this option is not available.

Response categories:

- Yes
- No

## PREVALENT FORM OF COMMERCIAL TRANSACTION

Description: type of commercial transaction between the provisioning service and the client. B2B refers to transactions between the provisioning service and other firms; B2C between the provisioning service and consumers; C2C between consumers.

Guidelines for the coding: Distinguish between the prevalent form of transaction.

Response categories:

- B2B
- B2C
- C2C
- B2B & B2C (select this only if you can clearly identify the two commercial souls in the website)
- Other

## YEAR OF FOUNDATION OF THE FOOD PROVISIONING SERVICE

Description: year of foundation of the provisioning service.

Guidelines for the coding: use the service web.archive.org or the section regarding the history of the provisioning service to retrieve the plausible year of foundation. Select 'not reported' if this information is not retrievable.

Open response (4 digits) or 'not reported'

## YEAR OF FOUNDATION OF THE CURRENT WEBPAGE AS AN ONLINE STORE

Description: year of foundation of the provisioning service as an online provisioning service

Guidelines for the coding: use the service web.archive.org to visit previous version of the website so to retrieve the plausible year of foundation as an ONLINE food provisioning service. Select 'not reported' if this information is not retrievable.

Open response (4 digits) or 'not reported'

## LOCATION OF THE FOOD PROVISIONING SERVICE

Description: City where the provisioning service is located

Guidelines for the coding: add the city or the region where the provisioning service is located. Some provisioning services (usually independent stores and mass retail channels) may operate in several cities; if this is the case add the region (e.g. northern Italy or Tuscany). This information can be found at the bottom of the website or in the website information page. Select 'not reported' if this information is not retrievable.

Open response or 'not reported'

## MARKET GEOGRAPHICAL SCOPE

Description: reach of the products shipped by the provisioning service

Guidelines for the coding: Information are usually in the website page containing shipment information. If this is not the case, pretend to purchase food and look at the options.

Response categories:

- Local/Regional (customers can receive/pick up products only from/in a limited area)
- National (the provisioning service ships products nationally)
- International (the provisioning service ship products in Europe or in other continents)

## PRODUCER`S GEOGRAPHICAL AREA

Description: origin of the products sold by the provisioning service

Guidelines for the coding: Multiple responses are possible. Information can be found in the provisioning service description and by looking at the products sold.

Response categories (all that apply):

- Local/Regional (select if you can clearly identify a small/local producer, or there is reference to the artisanal nature of the product, or food is sold as representing the cultural heritage of the area):
- National (select if you can recognise famous national brands, or if you are sure that these products are manufactured in the national context):
- International (select if you can find products that come from other countries).

## MARKET ORIENTATION

Description: information on how the earnings are used by the provisioning service - profit or non-profit.

Guidelines for the coding: Select 'non-profit' if the provisioning service clearly has an organisational form that can be linked to a non-profit orientation (e.g. association or cooperative), or when there is enough evidence that earnings are invested for organizational purposes (e.g. it is clearly stated). Select 'for profit' all the other times.

Response categories:

- Profit
- Non-profit
- Not reported

## TYPE OF ORGANIZATION

Description: the organizational form of the provisioning service

Guidelines for the coding: select between enterprise, association, cooperative, informal group/network. Select association or cooperative when the organizational form is clearly provided in the website. Select informal

group/network when the website is just a tool used by a small group of users to organize themselves but no clear organisational form is identifiable. Select enterprise all the other times. Not reported if this information is not present at all.

Response categories:

- Enterprise
- Association/Cooperative
- Informal group/network
- Not reported

## NUMBER OF EMPLOYEES

Description: number of employees of the provisioning service

Guidelines for the coding: in the website of the provisioning service, look whether information regarding the number of employees is clearly stated.

Select 'not reported' if this information is not retrievable.

Open response or 'not reported'

## BAKERY, CEREALS, MEAT (FRESH), FISH (FRESH), FRUIT (FRESH), VEGETABLES (FRESH), ALCOHOLIC DRINKS, NON-ALCOHOLIC DRINKS, PRESERVES, SNACKS/CONFECTIONARY, CURED MEAT, DAIRY PRODUCTS, READY-MADE, OTHER

Description: type of food products sold by the provisioning service

Guidelines for the coding: look at the list of products sold by the provisioning service and select yes or no. Tick YES if at least one product belonging to one category is sold. Select NO otherwise.

Response categories:

- Yes
- No

## SELLING MECHANISM

Description: information on the selling mechanism connecting producers, provisioning service and consumers.

Guidelines for the coding: select 'producers sell to consumers' when the provisioning service clearly and solely operates as an intermediary connecting producers and consumers. Select 'producers sell to the provisioning service' when the provisioning service sells products which are produced by others. Select 'specify' and add a comment with a description when one of the two mechanisms is not clearly identifiable.

Response categories:

- Producers sell to consumers
- Producers sell to the provisioning service
- Specify (please explain)

## PRICING MECHANISM

Description: information on how the price of the food products are set

Guidelines for the coding: select 'fixed price set by the producers' when this is clearly stated in the website. Select 'fixed price set by the provisioning service' if this is clearly stated in the website. Select 'differentiated price based on consumer features' when this is clearly stated in the website (e.g. there are options to become a premium member or prices change depending on consumers' profiles). Select not reported if the pricing mechanism is not reported.

Response categories:

- Fixed price set by the producers
- Fixed price set by the provisioning service
- Differentiated price based on consumer features
- Not reported

## PUBLIC FUNDING

Description: whether the provisioning service has received public funding

Main issues: This information is almost never furnished by the provisioning service.

Guidelines for the coding: select 'yes' or 'partly' if this information is provided in the website. Select 'none' if the information is not given.

Response categories:

- All
- Partly
- None/Not reported

## TURNOVER

Description: turnover is the amount received in sales for a stated period (in Italian 'fatturato').

Guidelines for the coding: this information might be given in the provisioning service information page, but its publicity depends on national legislation. Select 'not reported' if this information is not retrievable.

Open response or 'not reported'

## NUMBER OF REGISTERED CONSUMERS

Description: the number of consumers registered to the provisioning service website.

Guidelines for the coding: this information might be found in the provisioning service information webpage, but it is rarely provided. Select 'not reported' if this information is not retrievable.

Open response or 'not reported'

## NUMBER OF PRODUCERS

Description: the number of producers registered/present in the provisioning service website

Guidelines for the coding: count manually the number of producers if this information is not immediately available. Select 'not reported' if the web-

site does not allow counting the number of producers.  
Open response or 'not reported'

## DEFINITION OF PRODUCTION STANDARDS

Description: information on the standards used by the provisioning service to select their products.

Guidelines for the coding: select 'Explicit' if the provisioning service clearly states and gives evidence that all products are selected through a formal protocol; select 'None' if this information is not relevant or it is presented in general terms (e.g. 'we select our products from local producers who look like they are sort of ok').

Response categories:

- Explicit
- None

## TYPE OF FOOD DELIVERY SERVICE (VALUE DELIVERY)

Description: information on the ways food is delivered to the consumer.

Guidelines for the coding: Select 'click and pick up' when the provisioning service just allows food collection and does not ship products. Select 'home delivery' when food is only shipped home. Select 'both' when consumer can choose.

Response categories:

- Click and pick up
- Home delivery
- Both
- Not reported

## VALUE CREATION (VALUE ADDED).

Description: information on why the provisioning service is attractive to customers.

Guidelines for the coding: Select 'special products' when the provision-

ing service sells products with particular characteristics (e.g. gluten free; vegan; ethnic). Select 'high quality products' when the products are selected because of their high quality (as stated in the website). Select 'low prices' when the provisioning service highlights that food products are sold at cheaper prices. Select 'convenience' if products are 'ready to cook' or 'ready to eat'. Select 'organic' if all products sold are organic. Multiple answers are now possible.

Response categories (all that apply):

- Special products (gluten free, vegan, ethnic, nutraceutical)
- High quality products
- Low prices
- Convenience
- Organic
- Other (please specify)

## VALUE CAPTURE

Description: information on how the provisioning service covers its cost and earns money

Guidelines for the coding: Select '% of sales' if the provisioning service takes a % out of each transaction between the producer and the consumer and this information is clearly reported. Select 'advertising' if the provisioning service has ads and banners on the website. Select 'fee' if the provisioning service offers an online window shop to producers that pay a monthly/annual fee and this information is clearly reported. Select 'price' if the producers state that they gain by applying a higher price to the products they buy from producers. Select 'not reported' if this information is not present.

Response categories (all that apply):

- % of sales
- Advertising
- Fee
- Price
- Not reported

## TYPE OF PAYMENT (PAYPAL, CREDIT CARD, CASH ON DELIVERY)

Description: information on how customers can purchase the products online  
Guidelines for the coding: in the website this information is almost always reported. When absent, try to purchase a product and see which options are given. Select yes if the type of payment is present. Select no if it's not present.  
Response categories:

- Yes
- No

## MISSION STATEMENT

Description: whether the provisioning service has a section in which describes, even very shortly, which are the objectives and the mission of the project.  
Guidelines for the coding: select yes every time a description (even very short) of the mission/objectives is furnished by the provisioning service  
Response categories:

- Yes
- No

## SUMMARY OF THE MISSION

Description: short description of the mission  
Guidelines for the coding: English translation of the mission (or a summary).  
Open response

## MOBILE APP, FACEBOOK PAGE/GROUP, TWITTER, SNAPCHAT, INSTAGRAM, PINTEREST, GOOGLE+, WHATSAPP, TELEGRAM, YOUTUBE CHANNEL

Description: social media where the provisioning service is active  
Guidelines for the coding: usually reported at the bottom of the website. Notice: often necessary to type in google to see whether the provisioning service is active on social media and these are not indicated in the website. Select yes if the

provisioning service has a page/profile on the social media: select no otherwise.  
Response categories:

- Yes
- No

## REGISTRATION REQUIRED TO ACCESS CONTENT/SERVICE

Description: the provisioning service allows you to buy food products only with registration or also as a guest.  
Guidelines for the coding: select 'yes' if you are obliged to register in order to purchase the food products. Select 'no' otherwise.  
Response categories:

- Yes
- No

## BLOG WITH UPDATED INFORMATION

Description: the provisioning service has a blog with articles.  
Guidelines for the coding: Select 'yes' if the provisioning service has a blog with updated posts (less than 1 year old).  
Response categories:

- Yes
- No

## PRESENCE OF VIDEOS ON SOCIAL MEDIA PAGES AND/OR WEBSITE

Description: the provisioning service hosts video related to the service in the webpage  
Guidelines for the coding: select 'yes' if there are videos in the website or in the social media pages.  
Response categories:

- Yes
- No

## PRESENCE OF A REVIEW ON SOCIAL MEDIA PAGES AND/OR THE WEBSITE

Description: the provisioning service hosts a review system of the provisioning service itself

Guidelines for the coding: select 'yes' if there is a review system in the website or in the social media pages. Select 'no' otherwise.

Response categories:

- Yes
- No

## ORGANIC PRODUCTS

Description: the provisioning service sells organic products or not

Guidelines for the coding: select 'sells only certified organic products' if all products sold are organic. Select 'does not sell organic products' if there are no organic products at all. Select 'both' if there is at least one organic product sold. If you are unsure how to look for this information use the search box and type 'organic': if at least one result is displayed, tick 'sells both organic and non-organic products'.

Response categories:

- Sells only certified organic products
- Does not sell certified organic products
- Sells both organic and non-organic products
- Other (please specify)

## STATEMENTS REGARDING FOOD MILES

Description: the provisioning service states that products are shipped only within few miles for environmental reasons.

Guidelines for the coding: select yes if this is clearly identifiable/stated in the website. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING WELLBEING/HEALTH

Description: the provisioning service sells products which are beneficial for the wellbeing/health of the customer.

Guidelines for the coding: select yes only if this is clearly stated. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING ENVIRONMENTAL PROTECTION

Description: the provisioning service sells/ships products keeping an eye on environmental concerns.

Guidelines for the coding: select yes only when this commitment is clearly stated in the website. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING EQUITY/FAIR TRADE

Description: the provisioning service values fair trade, working condition and producers

Guidelines for the coding: select yes if it is clearly stated in the website that they care of equity and fair trade condition. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING SEASONAL

Description: the provisioning service values seasonality of the food products sold

Guidelines for the coding: select yes if this is clearly stated in the webpage.

Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING CULTURAL HERITAGE/SKILLS/TRADITIONS

Description: the provisioning service values artisanal products, traditions and producers respecting particular crafting processes

Guidelines for the coding: select yes if this is clearly stated in the webpage.

Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING FOOD AND NUTRIENT NEEDS

Description: the provisioning service sells products for a particular target group (e.g. celiac or vegan or lactose-free)

Guidelines for the coding: select yes if the provisioning service clearly targets at least one group (e.g. gluten free online shop) or if the provisioning service highlights this in the website (e.g. there is a category of food products named e.g. 'vegan' or 'gluten free' or 'lactose free'. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING FOOD WASTE

Description: the provisioning service tries to avoid food waste and/or adopts systems to reduce food waste. Guidelines for the coding: select yes only if clearly stated in the webpage and you can read the words 'food waste' in your language. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING PESTICIDE FREE

Description: the provisioning service sells products that are pesticide free

Guidelines for the coding: select yes if this commitment is clearly stated in the website. Select 'no' otherwise.

Response categories:

- Yes
- No

## STATEMENTS REGARDING GMO'S FREE

Description: the provisioning service sells or values products that are GMO's free

Guidelines for the coding: select yes if this is clearly stated in the website. Select 'no' otherwise.

Response categories:

- Yes
- 2. No





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