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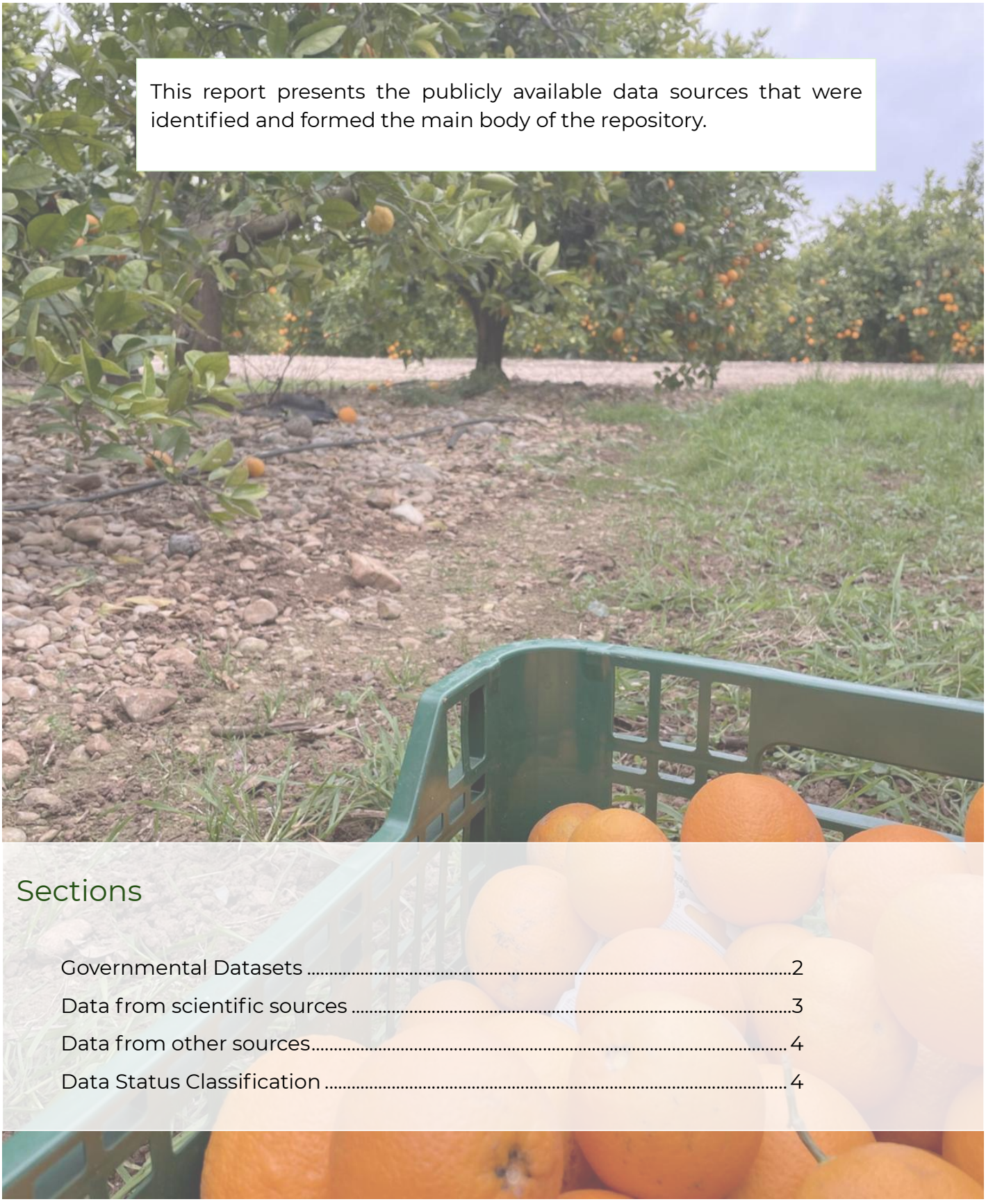
FOLOU Data Sources



This report presents the publicly available data sources that were identified and formed the main body of the repository.

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Governmental Datasets

A substantial part of repository is built on available data on food production from national statistical agencies. This data includes information such as production and harvested volumes, surface areas, time series data etc. However, not every dataset has the same level of informational detail. Table 1 presents all the national/governmental datasets that were identified through the systematic data collection in the FOLOU project.

Table 1: List of public/governmental datasets and the information they contain (FL: Food Loss)

Country	Type	Time series data	Absolute FL volume	FL Ratios	Commodity Categories	Source/URL
Belgium	Report	No	Yes	Yes	Fish and Fisheries Products	Vlaanderen
Czechia	Tables	Yes	Yes	Yes	Meat and Dairy Products	Czech Statistical Office
Denmark	Report	No	Yes	Yes	Fruits and Vegetables, Meat and Dairy Products, Roots, Tubers and Oil Crops	Danish Environmental Protection Agency
Germany	Tables	Yes	Yes	No*	Cereals and Pulses, Fruits and Vegetables, Meat and Dairy Products, Roots, Tubers and Oil Crops	Federal Ministry of Food and Agriculture
Germany	Report	No	Yes	No*	Cereals and Pulses, Fruits and Vegetables, Roots, Tubers and Oil Crops	Thünen Institut
Iceland	Report	No	Yes	No*	Fruits and Vegetables, Meat and Dairy Products	Environment Agency of Iceland
Ireland	Report	No	Yes	Yes	All	Environmental Protection Agency
Italy	Tables	Yes	Yes	No*	Fruits and Vegetables, Cereals and Pulses, Roots, Tubers and Oil Crops	National Institute of Statistics
Italy	Report	No	Yes	Yes	Fruits and Vegetables	OERSA
Norway	Tables	No	Yes	Yes	Fruits and Vegetables, Roots, Tubers and Oil Crops	Statistics Bureau
Spain	Report	No	Yes	Yes	Fish and Fisheries Products, Fruits and Vegetables	Basque Foundation for Agri-Food Safety

Spain	Report	No	Yes	Yes	Fruits and Vegetables	CREDA
Spain	Report	No	Yes	Yes	Fruits and Vegetables	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Fruits and Vegetables	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Meat and Dairy Products	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Fruits and Vegetables	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Fruits and Vegetables	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Meat and Dairy Products	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Fish and Fisheries Products	CREDA-UPC-IRTA
Spain	Report	No	Yes	Yes	Fish and Fisheries Products	CREDA-UPC-IRTA
Spain	Tables	Yes	No*	No*	Fruits and Vegetables, Cereals and Pulses, Roots, Tubers and Oil Crops	Ministry of Agriculture, Fisheries and Food
Sweden	Tables	No	Yes	Yes	Meat and Dairy Products	The Swedish Board of Agriculture

* can be calculated

Data from scientific sources

Apart from datasets and reports from governmental bodies, a significant amount of data was contributed through research activities and publications. Table 2 lists the sources and the associated countries.

Table 2: List of scientific/research sources on Food Loss data and the information they contain (FL: Food Loss, PRP: Peer Reviewed Publication, GL: Gray Literature)

: Cereals and Pulses **: Fish and Fisheries Products** **: Fruits and Vegetables**
: Meat and Dairy Products **: Roots, Tubers and Oil Crops**

Country in Focus	Type	Estimation Method	FL Ratios	Commodity Categories					Source / URL
Austria	GL	Surveys / Records	Yes	x		x		x	Global 2000
Austria Germany	PRP	Weighting / Observation	Yes					x	Schneider et al., 2019
Belgium Germany Italy Netherlands Portugal Slovenia Spain	Other	Literature / Experts / Surveys / Records	Yes			x		x	Breadcrumb Project
Denmark	GL	Surveys / Records	Yes			x		x	DCA Report 143
Denmark Finland France	PRP	Weighting / Observation	Yes	x		x		x	Caldeira et al., 2021
Estonia	GL	Surveys / Records	Yes	x	x	x	x	x	Stockholm Environment Institute

France	PRP	Literature / Experts	Yes		x	x		x	Redlingshöfer et al., 2017
Italy	PRP	Literature / Experts	No*					x	Amicarelli et al., 2022
Germany	PRP	Literature / Experts	Yes				x		Xue et al., 2019
Germany	PRP	Weighting / Observation / Literature / Experts	Yes			x		x	Voge et al., 2023
Germany	PRP	Statistical Estimation	Yes			x		x	van der Wiel et al., 2021
Germany	PRP	Surveys / Records	Yes			x		x	Ludwig-Ohm et al., 2019
Lithuania	GL	Surveys / Records	Yes	x		x	x	x	Baležentis, T., 2021
Poland	PRP	Surveys / Records	No*		x	x	x		Łaba et al., 2022
Sweden	GL	Weighting / Observation / Literature / Experts				x			Strid and Eriksson, 2014
Slovakia	PRP	Surveys / Records	Yes				x		Medveďová et al., 2022
Spain	PRP	Surveys / Records	Yes	x	x	x	x	x	Garcia-Herrero et al., 2018
Switzerland	PRP	Literature / Experts	Yes			x		x	Amman et al., 2025
Switzerland	GL	Literature / Experts	Yes			x		x	Beretta and Hellweg, 2019

* can be calculated

Data from other sources

The rest of the data is taken from reports and studies taken by Non Governmental Organisations (NGOs), intergovernmental cooperation or private initiatives. Table 3 lists the sources and the associated countries.

Table 3: List of remaining sources on Food Loss data and the information they contain (FL: Food Loss, IG: Intergovernmental)

: Cereals and Pulses **: Fish and Fisheries Products** **: Fruits and Vegetables**
: Meat and Dairy Products **: Roots, Tubers and Oil Crops**

Country in Focus	Type	Estimation Method	FL Ratios	Commodity Categories					Source / URL
Czechia	Other	NA	Yes				x		ČMSCH
Denmark	NGO	Surveys / Records	Yes			x	x	x	ONE THIRD
Denmark Norway Sweden	IG	Statistical Estimation / Surveys / Records	Yes	x	x	x	x	x	Nordic Council
Denmark Finland France Great Britain Norway Sweden Switzerland	NGO	Surveys / Records	Yes	x		x	x	x	FAO
Latvia	NGO	Literature / Experts	Yes			x	x	x	LVAF
Spain	NGO	Weighting / Observation / Literature / Experts	Yes			x		x	CPAEN

Data Status Classification

Definitions and data specifications across countries and entities are subject to different interpretations in terms of what is considered food loss, how it is measured and what are the boundaries of the food loss that is being assessed[1].

[1] For more information, please refer to the FOLOU definitional framework and the report on Food Loss definitions.

Therefore, in the studies identified by the FOLOU project there was a discrepancy of what each food loss data entails and how closely it aligns with the FOLOU definitional framework. For this purpose, a data status classification was created, where food loss definitions and data was assigned a quality status in terms of alignment with the FOLOU definition.

Table 4: Data categories according to the level of alignment with the FOLOU FLDF

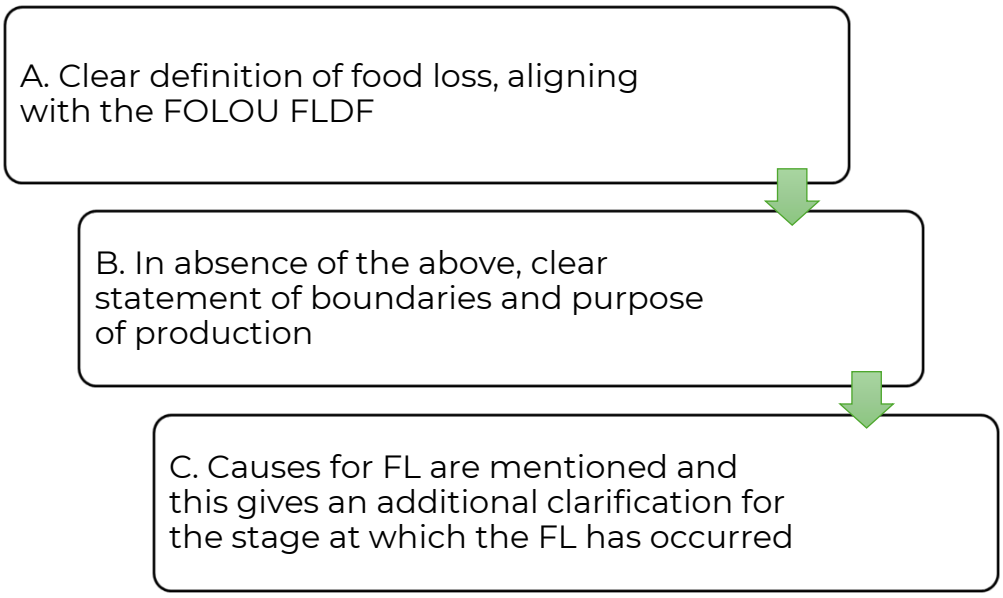
Category	Description
A	It represents flows that are well defined in the document and fall under the FOLOU definitional framework for Food Loss. Here, the boundaries and/or the stage in which the food loss was measured are clear.
B	Data probably falls under FOLOU criteria; clarification might be needed
C	Unclear if data falls under FOLOU criteria; very little explanation given on the system boundaries
D	Data probably does not fall under FOLOU criteria; certain exclusion, however, cannot be made

Category A:

This category represents flows that are well defined in the document and/or the dataset and fall under the FOLOU definitional framework for Food Loss. Here, the boundaries and/or the stage in which the food loss was measured are clear.

Here it should be stressed that even though a data source falls under Category A, this does not guarantee 100% alignment with the FOLOU FLDF. One important note must be made regarding the destination of FL. In all the dataset, less than 0.05% of the data includes related information, apart from the data derived from the FOLOU case studies. Therefore, this criterion misses from the categorisation scheme.

Below is a hierarchical scheme of when data can fit under category A:



Example: FAO data for Sweden in 2011 provides the following information:

Commodity: Carrot and turnip
Stage: Harvest
Causes: Due to unacceptable size and shape, insect or animal damage

Here, the FL was measured during harvesting and the causes are clearly mentioned. Therefore, the information falls under Category A, even though the FLW definition does not align with the one adopted by FOLOU.

Category B:

This category represents flows that are adequately defined in the document and/or the dataset and probably fall under the FOLOU FLDF. Some clarifications, however, are needed for the specifications of the stage in which the food loss was measured (e.g. during harvest, storage etc.).

Example: FAO data for Finland in 2017 provides the following information:

Commodity: Rye
Stage: Farm
Causes: Due to harvesting technique, weather conditions and quality problems

Here, the FL is on the farm level and probably falls under the FLDF. However, since no information is given on whether pre-harvest or transportation is included, the data cannot be assigned to Category A with certainty. Therefore, the data is classified under Category B.

Category C:

This category represents flows that are not well defined in the document and/or the dataset and therefore it is not clear if they fall under the FOLOU definitional framework. Little information is given on the conditions of the food loss calculations, where definitions of primary sector and the system boundaries are either lacking detailed information or are absent.

Example A: Breadcrumb project data for Slovenia for 2024-2025 provides the following information:

Commodity: Apple
Stage: NA (Primary Production)
Causes: Standards related to appearance, shape and quality
Comment: Suboptimal produce like tomatoes, zucchini, and apples is often repurposed into sauces, juices, or pickles, while items such as onions, potatoes, and pumpkins are more likely to be discarded due to limited reuse options.

Here, the amount that is found as FL might be repurposed for human consumption. However, specifics are not given for the percentage of actual FL and hence the data cannot be excluded. Furthermore, the rest of information is close to the FLDF and therefore the data is classified under Category C and not D.

Example B: National data for Denmark for 2018 provides the following information:

Commodity: Milk
Stage: NA (Primary)
Causes: none
Comment: Includes transportation and storage

Here, the amount that is found as FL is for human consumption and it's not repurposed as in Example A. However, the FL amount is calculated while taking into consideration transportation and storage and no specification is provided as to if these are within the farm. Therefore, the data is classified under Category C.

Category D:

This category represents flows that are deemed likely to include flows outside the FOLOU definitional framework. However, due to the lack of information available in the identified document and/or dataset, the data cannot be excluded with certainty from the repository.

Such information is data taken from Eurostat, for example. In this case, no information is given for a number of aspects, such as the stages of primary production that are included, the purpose of the production and whether the FL is repurposed for human consumption or animal feed.