



## 3<sup>rd</sup> Meeting

Quantifying Food Losses Across All Fronts – Local,  
Regional, and National Perspectives

23/05/24



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1. FOLOU Definitional Framework of Food Losses
2. Quantification Manual of Food Losses (measuring territories)



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# **1. FOLOU Definitional Framework of Food Losses**



# FL Definitional Framework

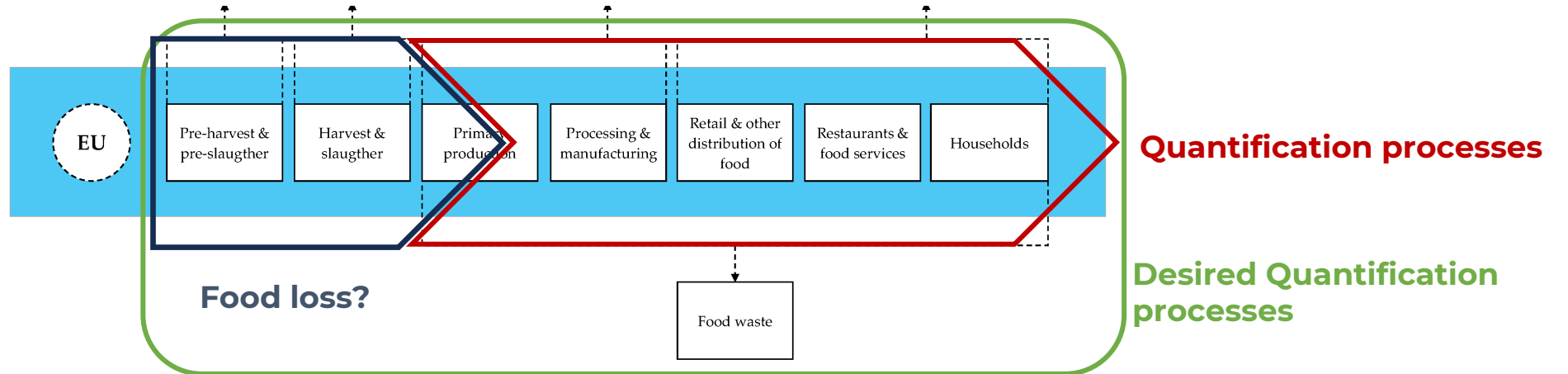
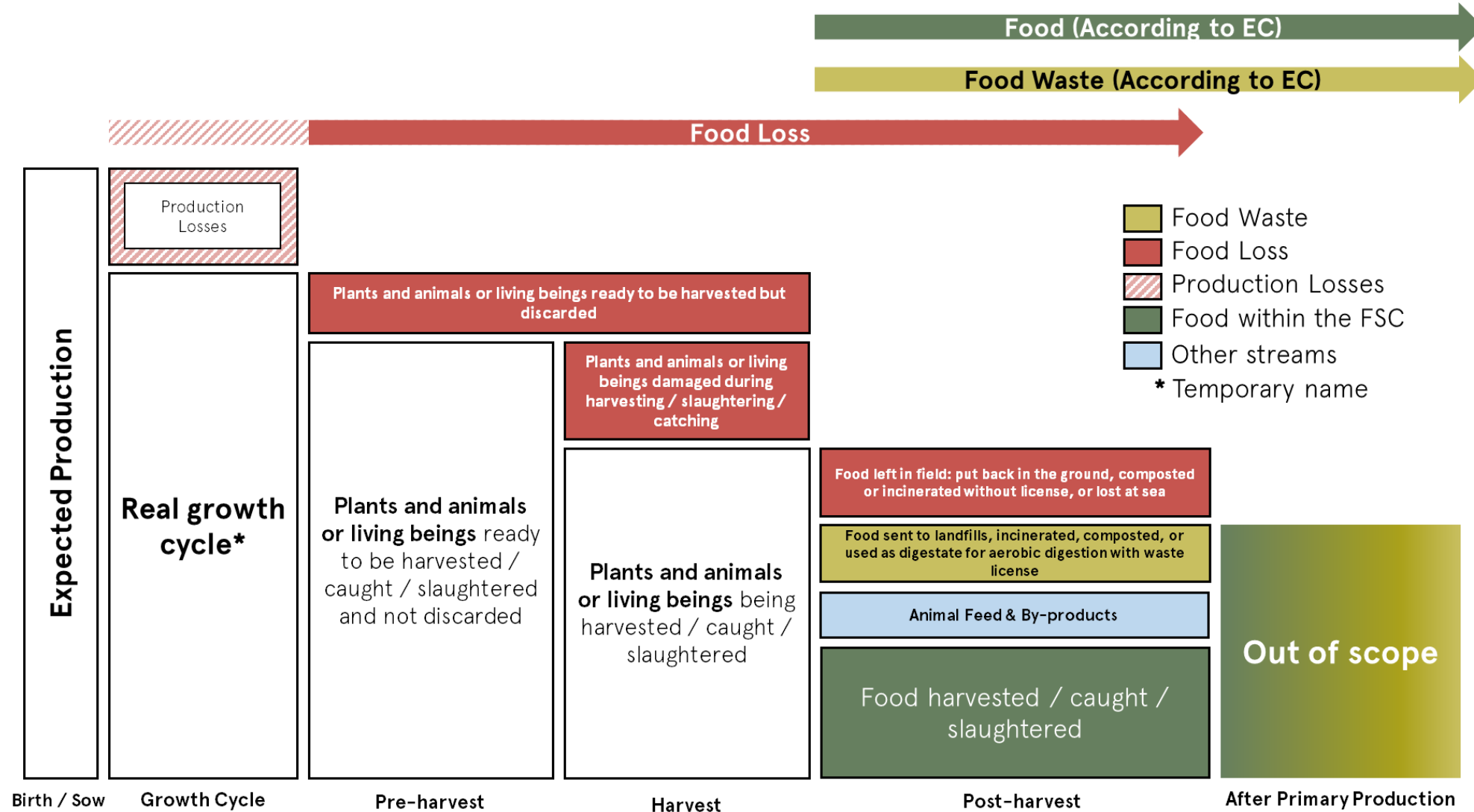


Image source: Leverenz, D.; Schneider, F.; Schmidt, T.; Hafner, G.; Nevárez, Z.; Kranert, M. Food waste generation in germany in the scope of european legal requirements for monitoring and reporting. Sustain. 2021, 13, doi:10.3390/su13126616

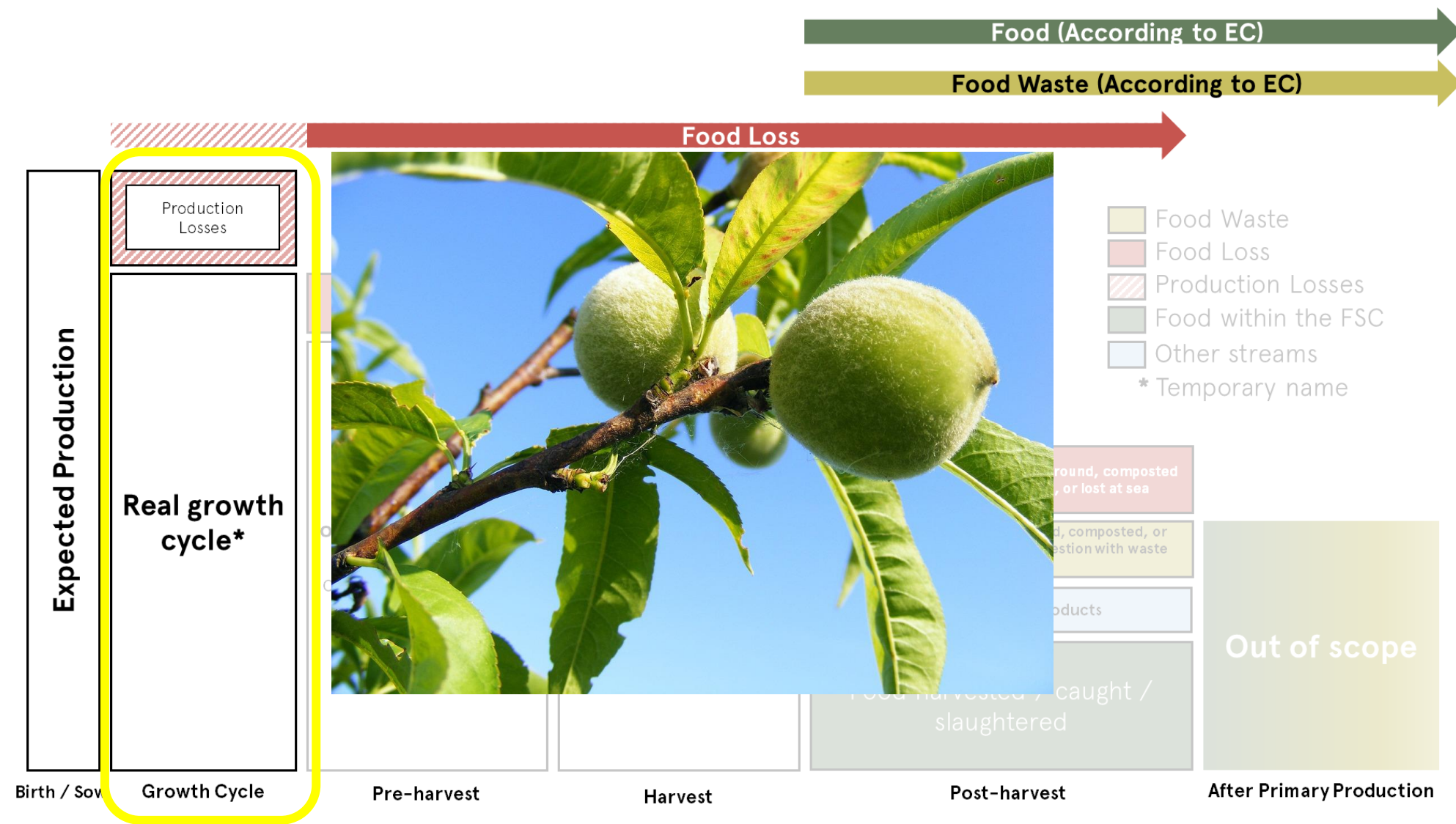
# FL Definitional Framework

**Food loss is any harvest-mature plant, animal or living being (including inedible parts) that is not successfully harvested, as well as food removed from the supply chain during post-harvest phase that does not become animal feed, by-product or food waste**

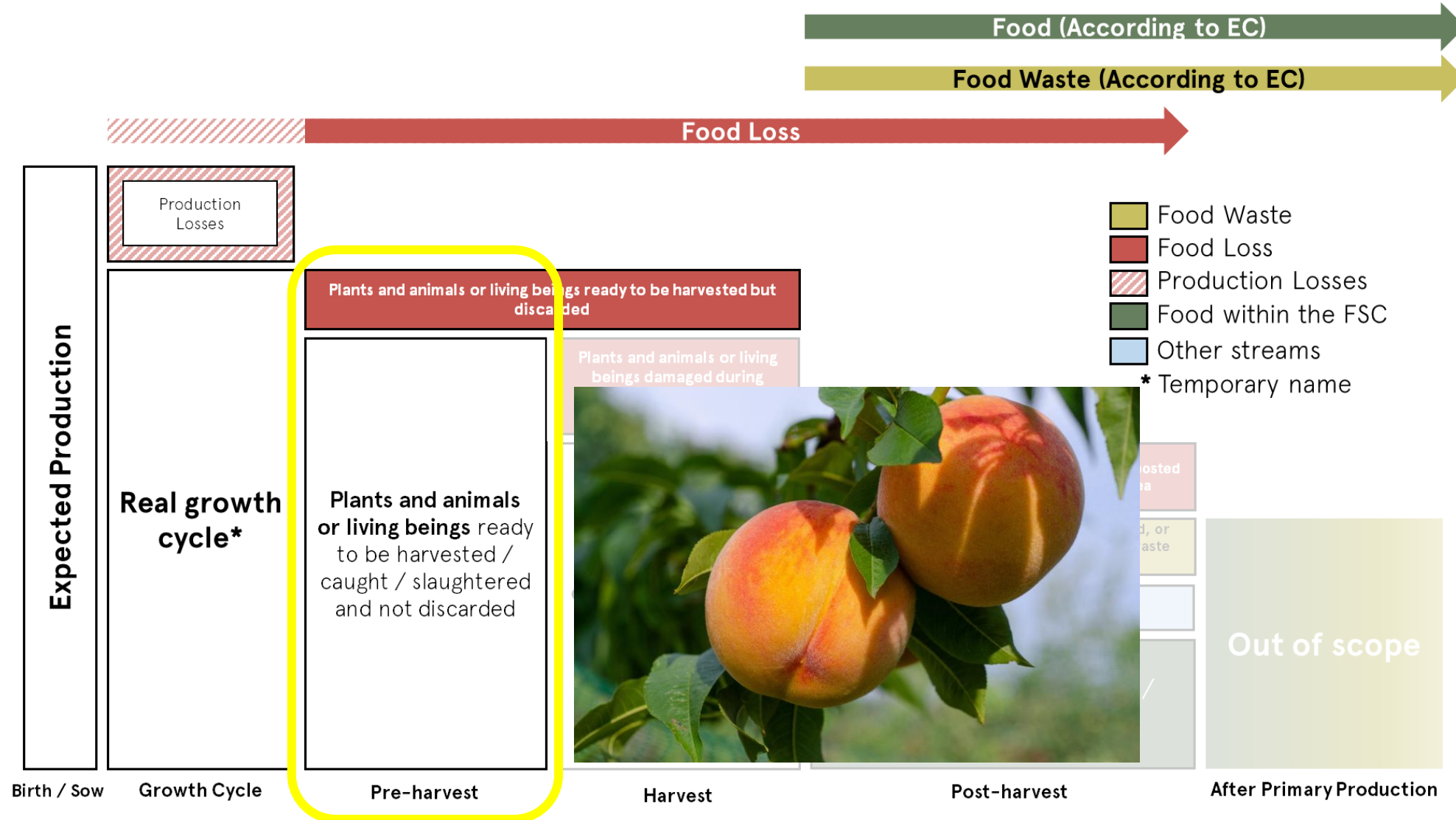
# FL Definitional Framework



# FL Definitional Framework



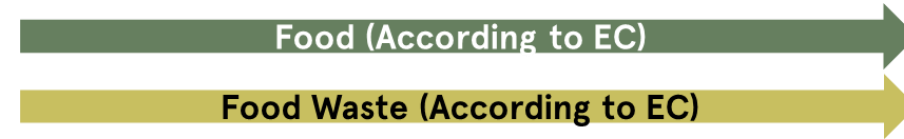
# FL Definitional Framework



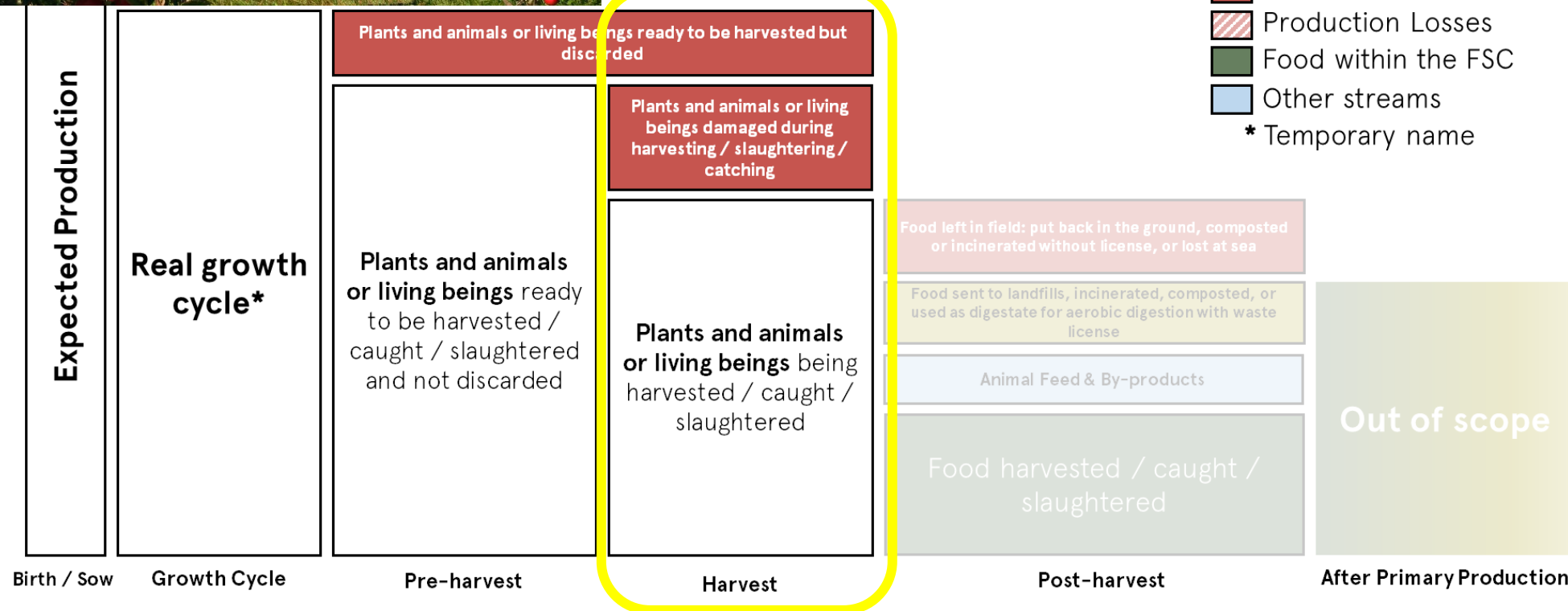




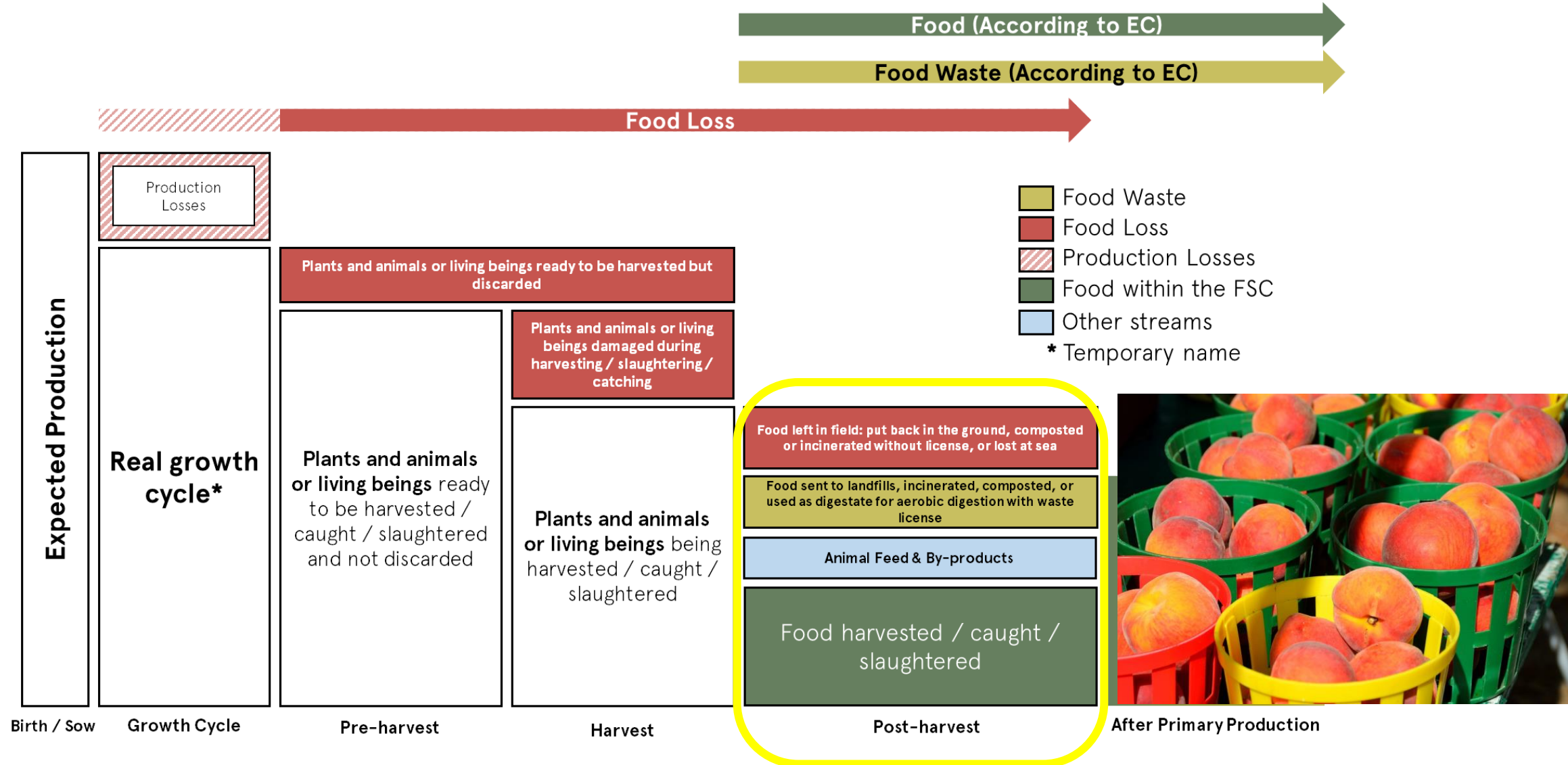
# Framework



-  Food Waste
-  Food Loss
-  Production Losses
-  Food within the FSC
-  Other streams
- \* Temporary name



# FL Definitional Framework



# Webinar:

## Defining Food Loss in the European Union Framework – Challenges and Significance



Scan me

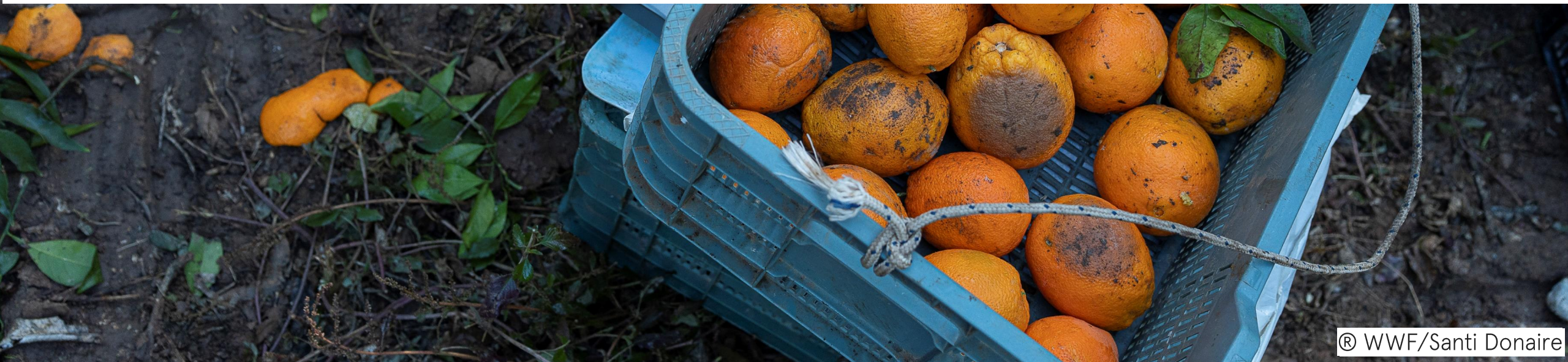


<https://www.folou.eu/webinar-series-kickoff-defining-food-loss-in-the-european-union-framework-challenges-and-significance/>





## 2. Quantification Manual of Food Losses

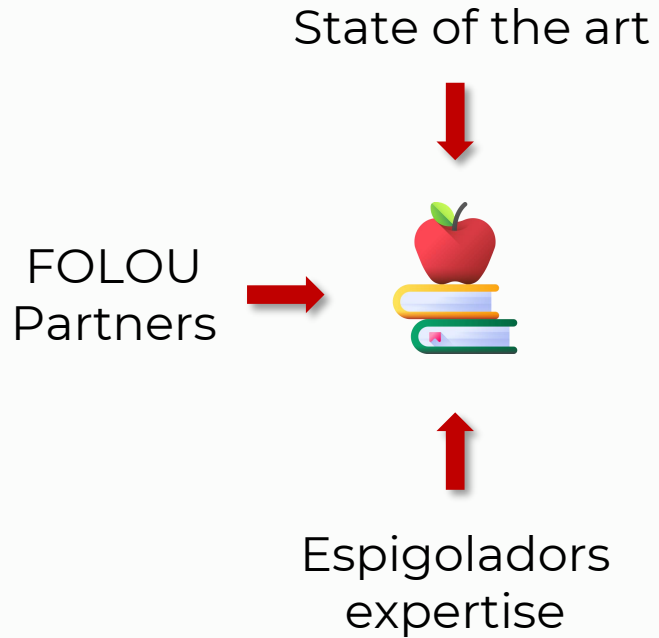




# Quantification Manual of FL



## Road map



Jan 23

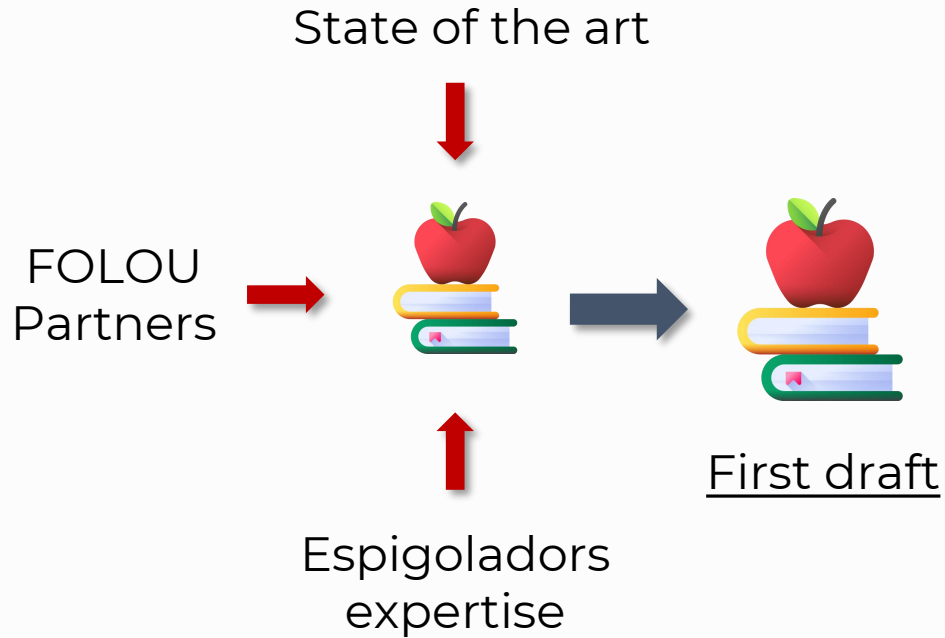


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# Quantification Manual of FL



## Road map



Jan 23

Sept 23



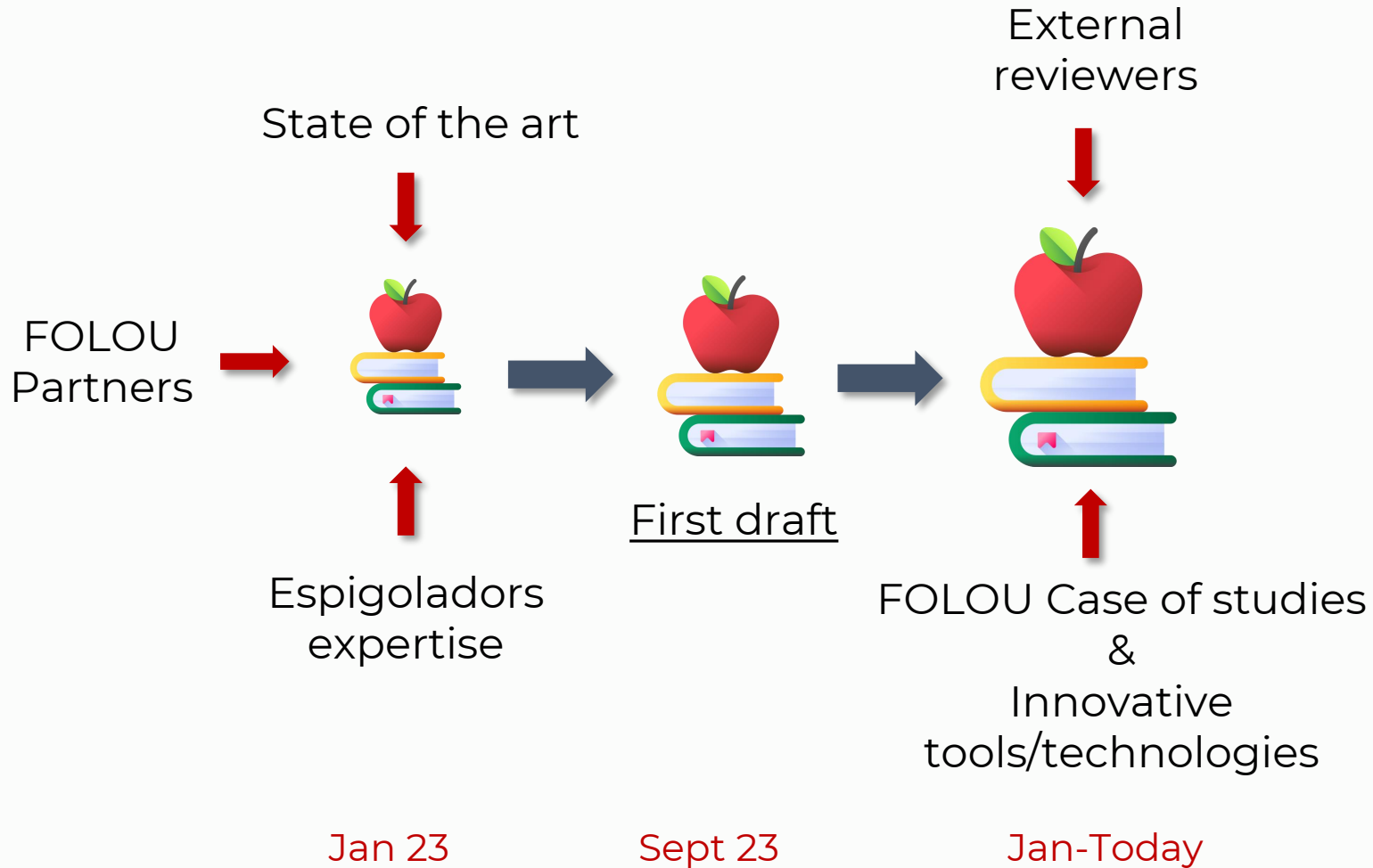
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# Quantification Manual of FL



## Road map

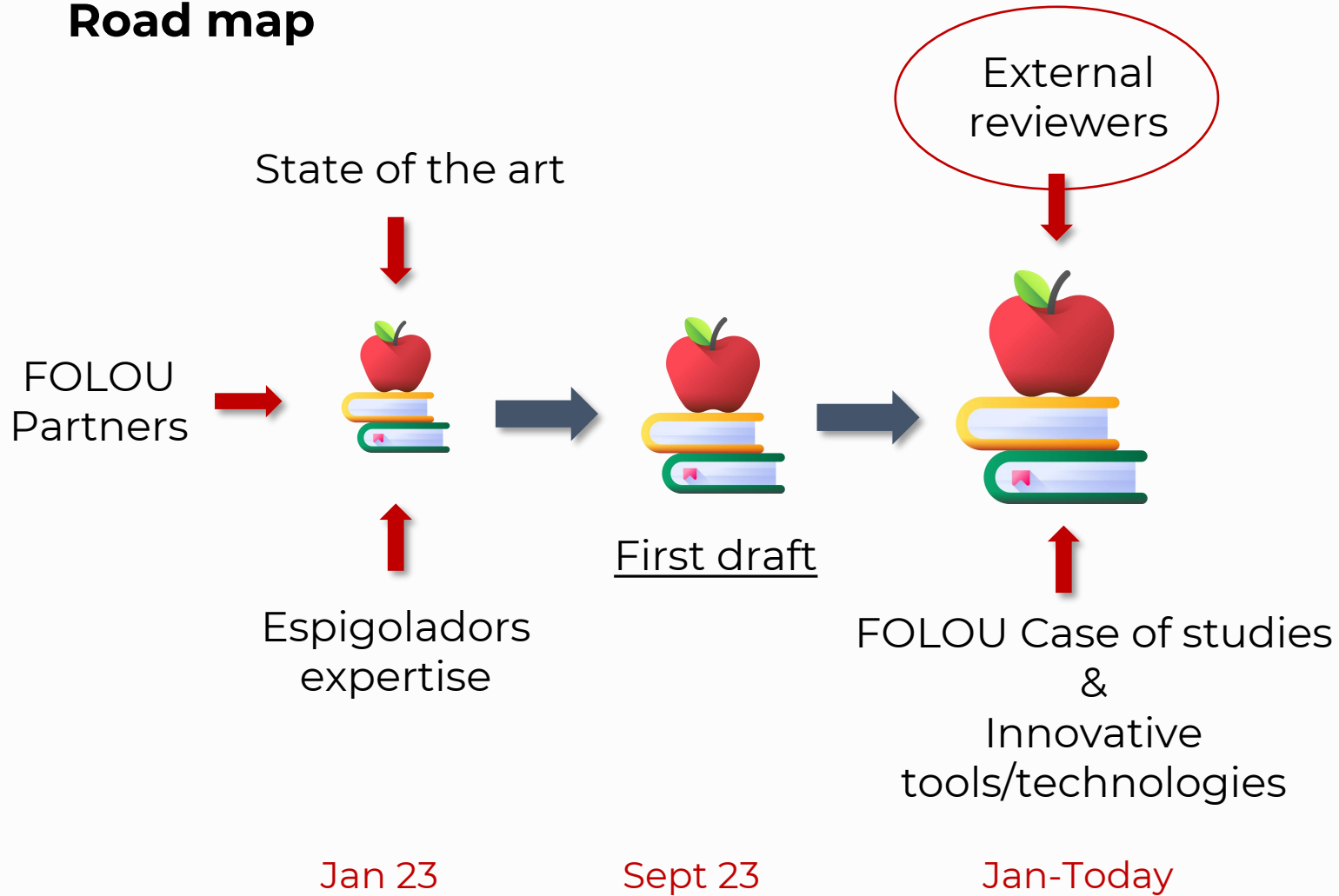


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# Quantification Manual of FL



## Road map

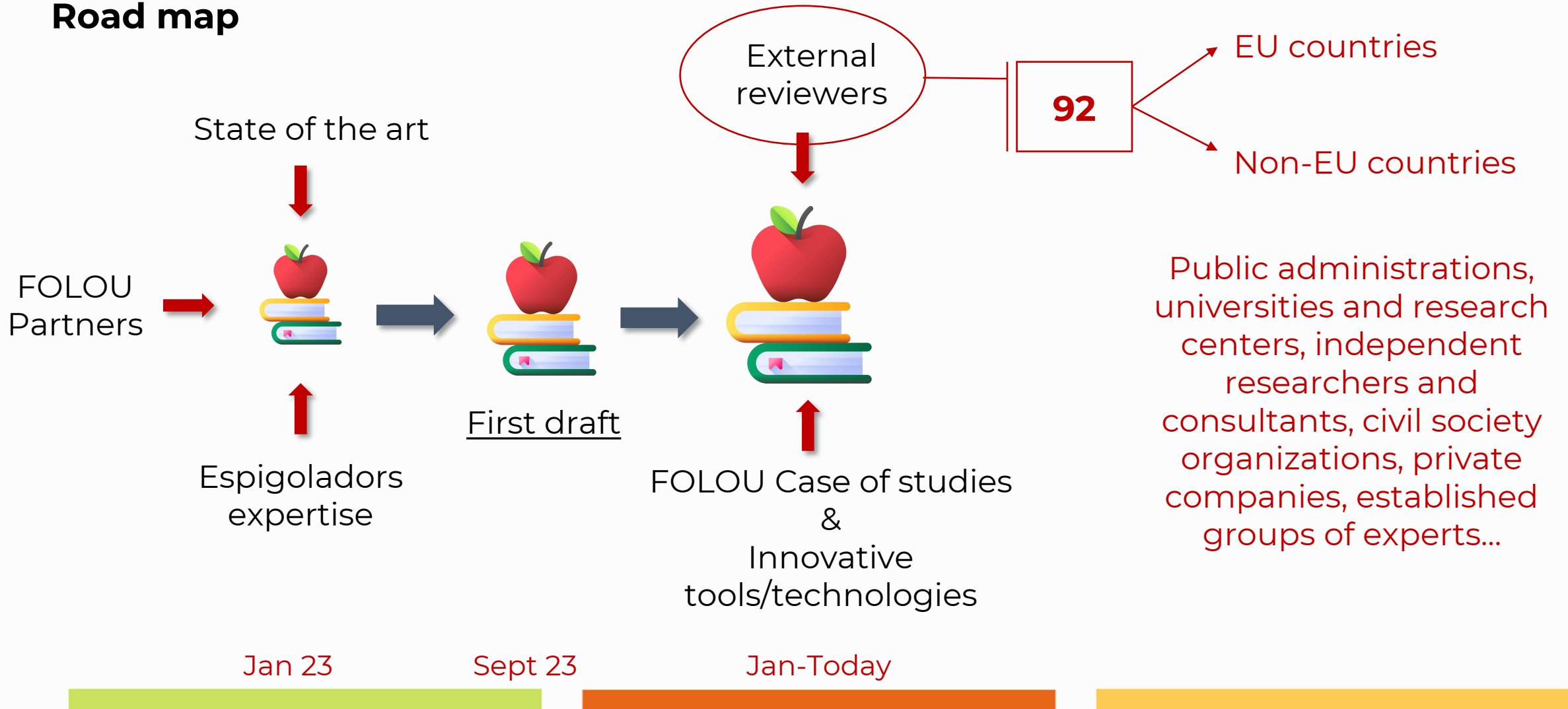


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# Quantification Manual of FL



## Road map



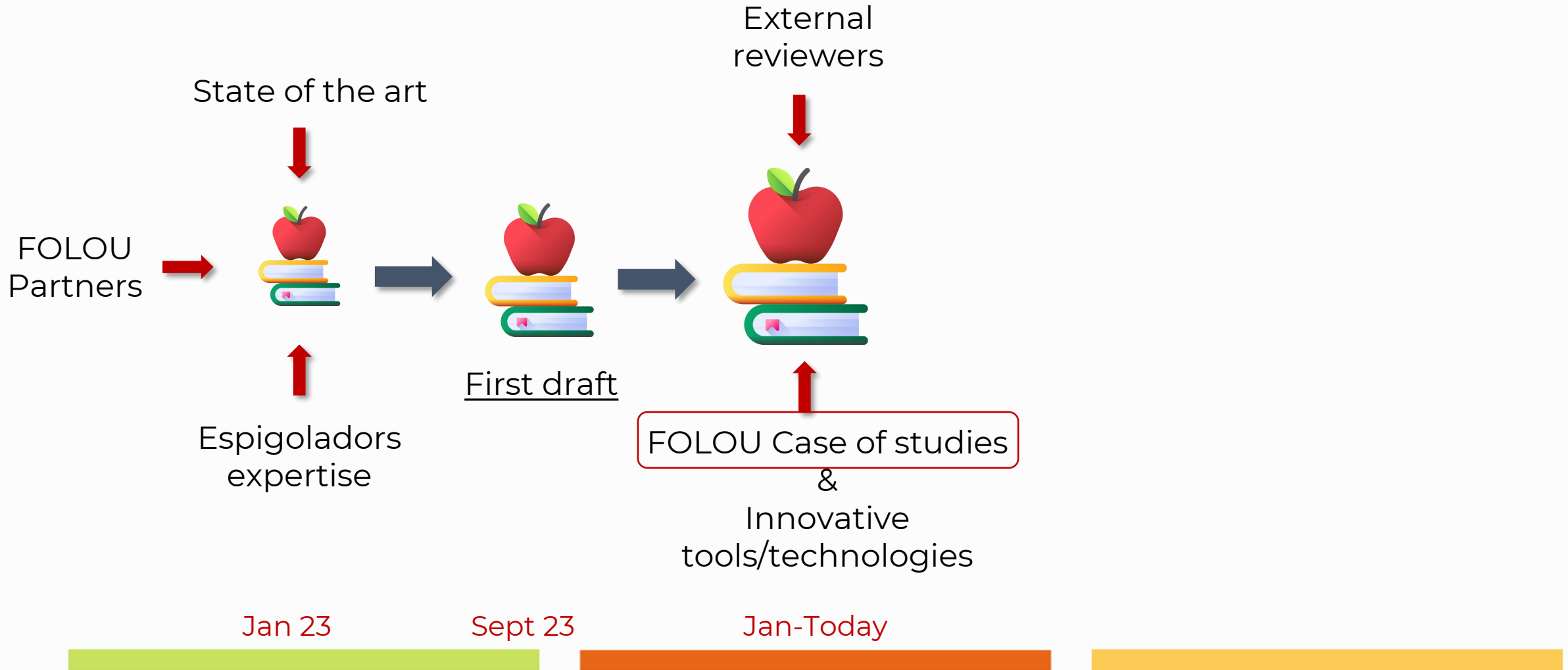
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# Quantification Manual of FL



## Road map



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# Quantification Manual of FL

## Case of studies



# Quantification Manual of FL

## Case of studies



Fruits and vegetables



- Apples
- Pears
- Tomatoes
- Peaches and nectarines
- Cabbages
- Lettuces
- Additional:
  - Artichokes
  - Citrus trees (oranges and mandarins)

Spain



# Quantification Manual of FL

## Case of studies



Fruits and vegetables



Cereals (maize) → Italy



# Quantification Manual of FL

## Case of studies



Fruits and vegetables



Cereals (maize)



Roots and tubers (potatoes) → Belgium



# Quantification Manual of FL

## Case of studies



Fruits and vegetables



Cereals (maize)



Roots and tubers (potatoes)



Dairy (milk) → Ireland & The Netherlands



# Quantification Manual of FL

## Case of studies



Fruits and vegetables



Cereals (maize)



Roots and tubers (potatoes)



Dairy (milk)



Aquaculture (fish) (salmon) → Norway





# Quantification Manual of FL

## Case of studies



Fruits and vegetables



Cereals (maize)



Roots and tubers (potatoes)



Dairy (milk)



Aquaculture (fish) (salmon)



Aquaculture (seafood) (mussels) → Italy

# Quantification Manual of FL

## Case of studies



Fruits and vegetables → Spain



Cereals (maize) → Italy



Roots and tubers (potatoes) → Belgium



Dairy (milk) → Ireland & The Netherlands



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## Case of studies



Fruits and vegetables → Spain



Cereals (maize) → Italy



Roots and tubers (potatoes) → Belgium



Dairy (milk) → Ireland & The Netherlands



Aquaculture (fish) (salmon) → Norway



Aquaculture (seafood) (mussels) → Italy

- Conventional
- Organic
- Agroecological

# Quantification Manual of FL

## Case of studies



Fruits and vegetables → Spain



Cereals (maize) → Italy



Roots and tubers (potatoes) → Belgium



Dairy (milk) → Ireland & The Netherlands

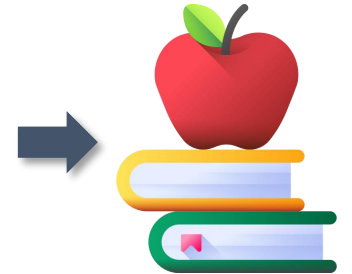


Aquaculture (fish) (salmon) → Norway



Aquaculture (seafood) (mussels) → Italy

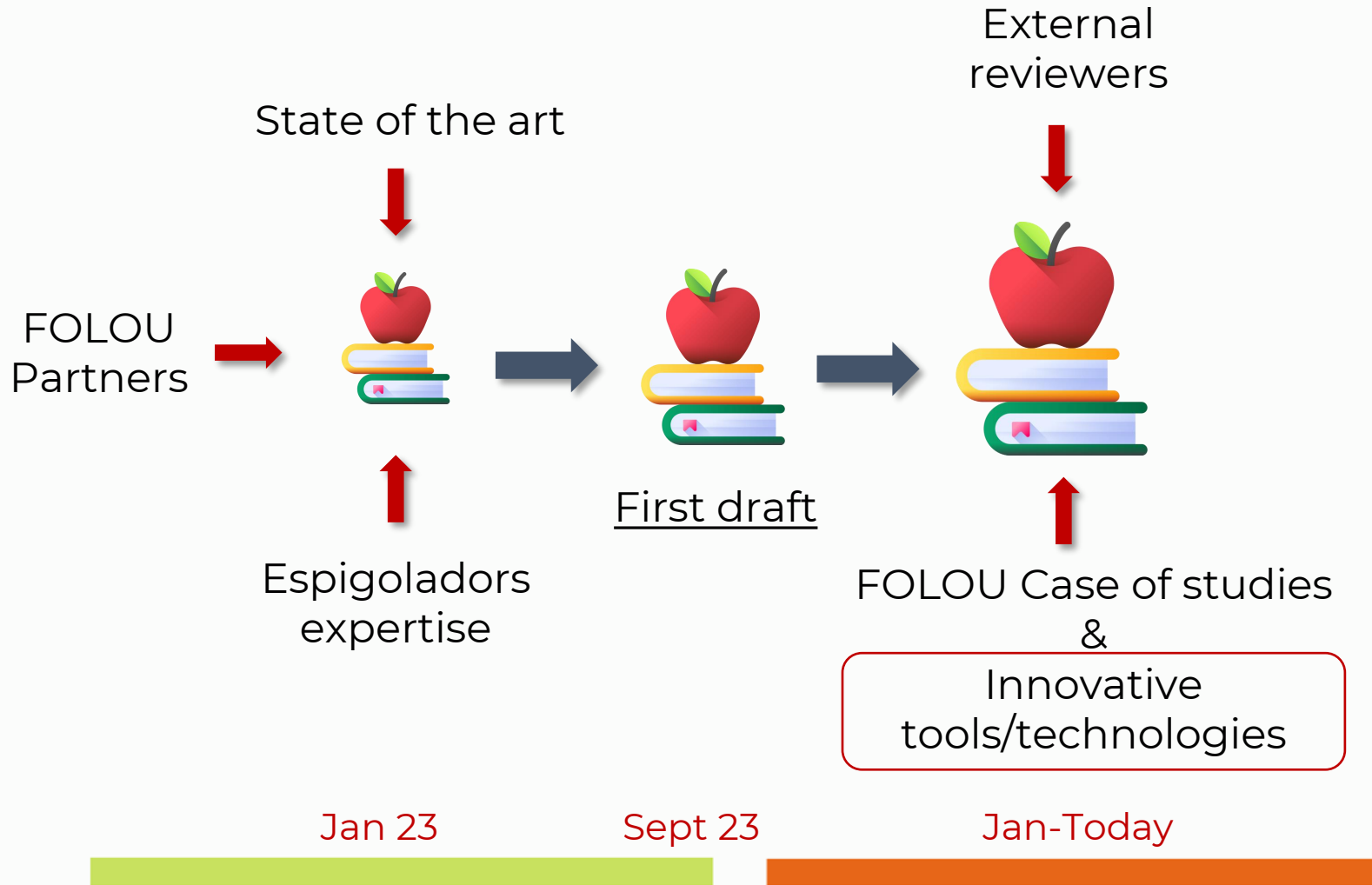
- Conventional
- Organic
- Agroecological



# Quantification Manual of FL



## Road map



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# Quantification Manual of FL



## FOLOU Innovative tools/technologies

- Harnessing Vision-Based Metrics for Quantifying Food Loss in Cauliflower Fields



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# Quantification Manual of FL



## FOLOU Innovative tools/technologies

- Counting apples and apple quality with drones and AI



Good quality



Medium quality



Bad quality

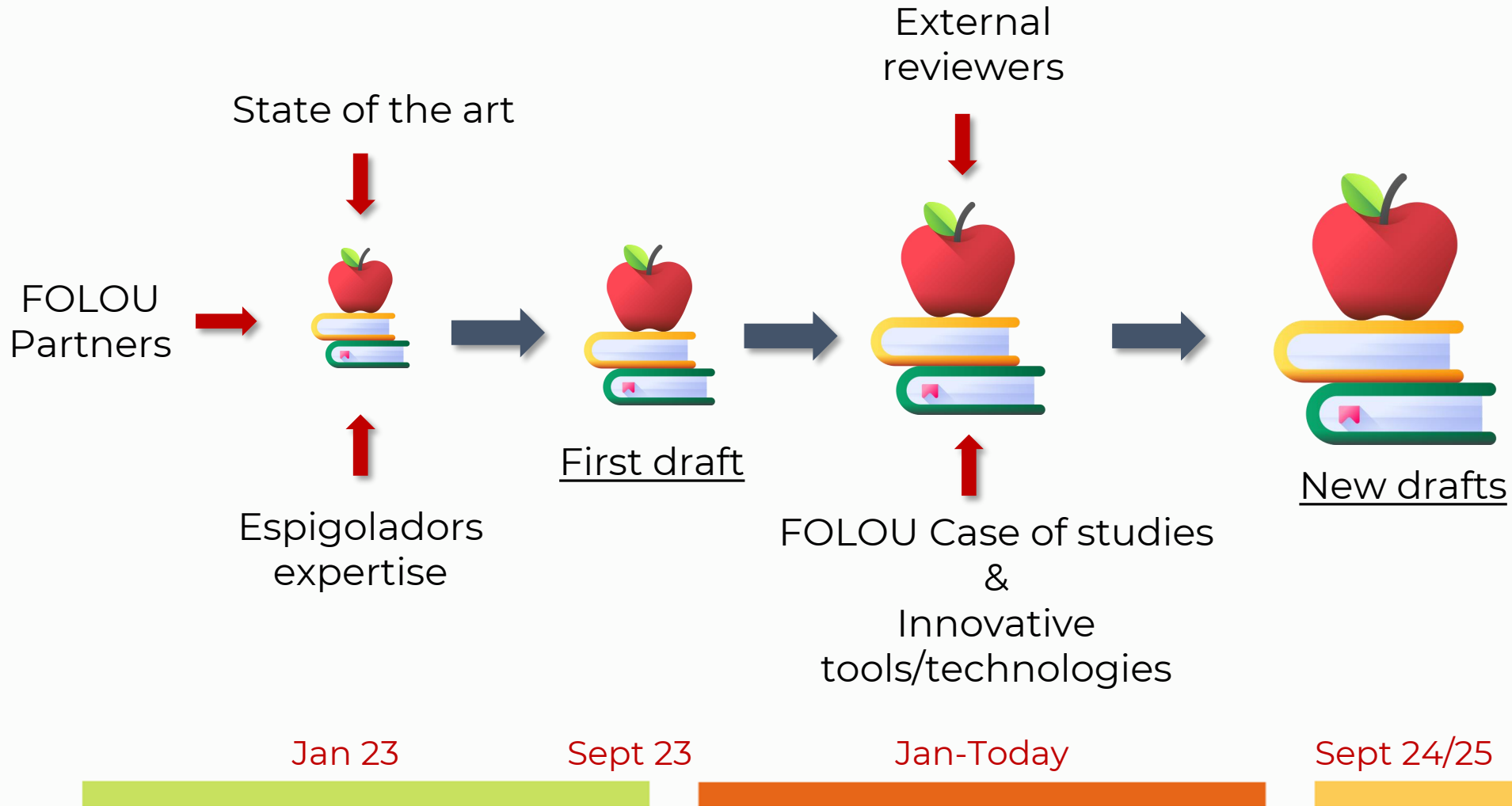


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# Quantification Manual of FL



## Road map

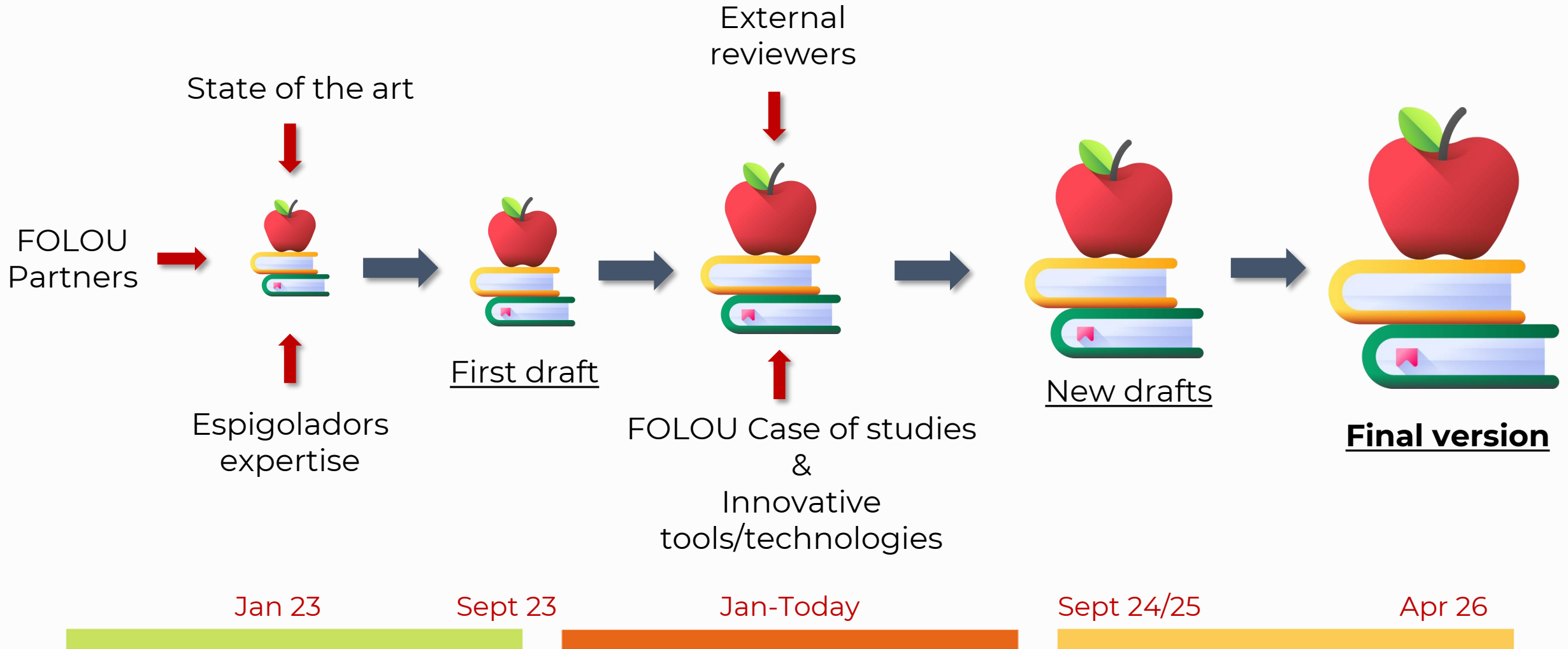


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# Quantification Manual of FL



## Road map



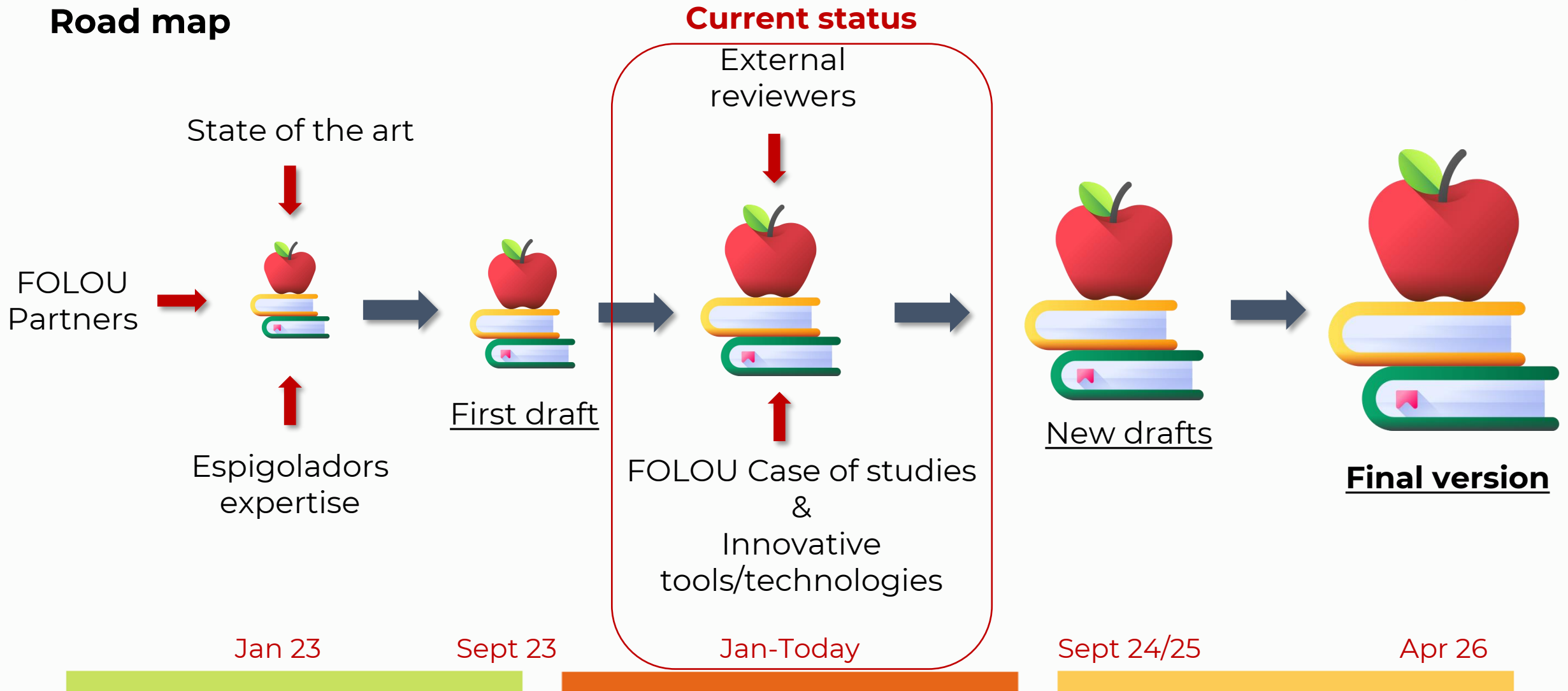
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# Quantification Manual of FL



## Road map



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# Quantification Manual of FL



## Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?



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# Quantification Manual of FL



## Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

2 main approaches:

Public administration  
(Territorial level)



Farmers, cooperatives or  
Specific research  
(Plot/Farm/Company level)



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# Quantification Manual of FL



## Main structure

- WHAT?
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# Quantification Manual of FL



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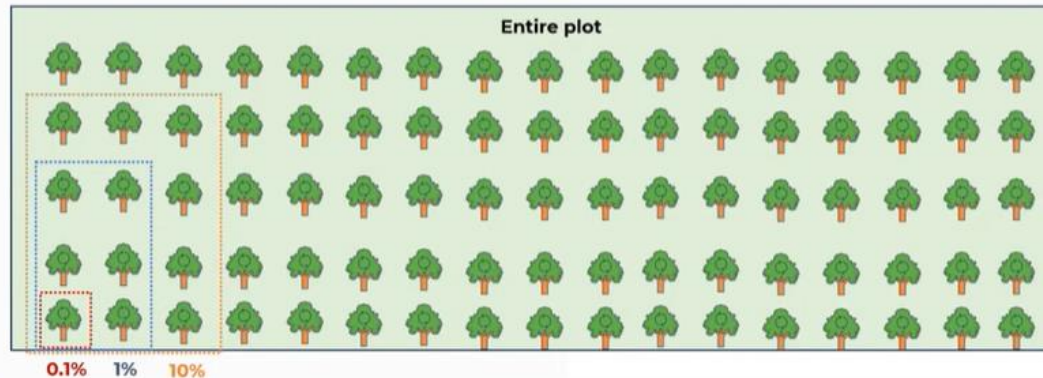
# Webinar II:

## Navigating Reliable Diagnoses for Measuring Food Losses in the Primary Sector of the Supply Chain

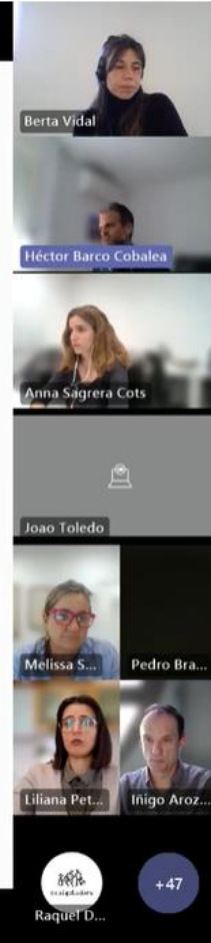
Main challenges: 3. Cuts (if applicable. Only crops)



- Sampling area: 0.1% / 1% / 10%
- Cuts (Single / Multiple) (only for crops)



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# Quantification Manual of FL



## Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

2 main approaches:

Public administration  
(Territorial level)



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# Quantification Manual of FL



## Main structure

- WHAT?
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Public administration  
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# Quantification Manual of FL

## Main structure

- WHAT?
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2 main approaches:

Public administration  
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Cities



Regions



Countries



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# Quantification Manual of FL

## Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

2 main approaches:

Public administration  
(Territorial level)



Cities



Regions



Countries



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# Quantification Manual of FL



- WHERE?

**1**

**2**

**3**

**4**

**5**



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# Quantification Manual of FL



- WHERE?

**1**



**2**



**3**



**4**



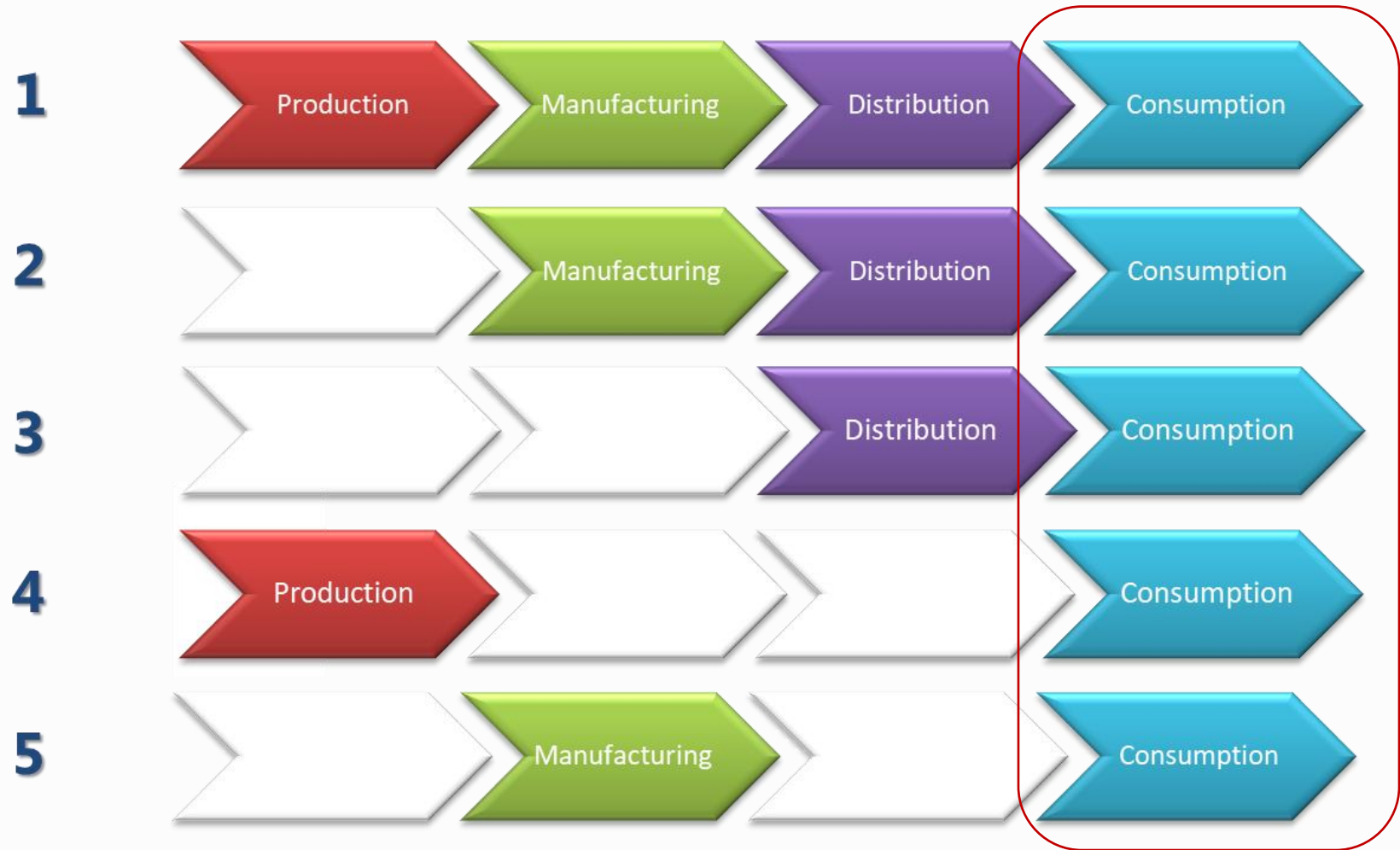
**5**



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- WHERE?

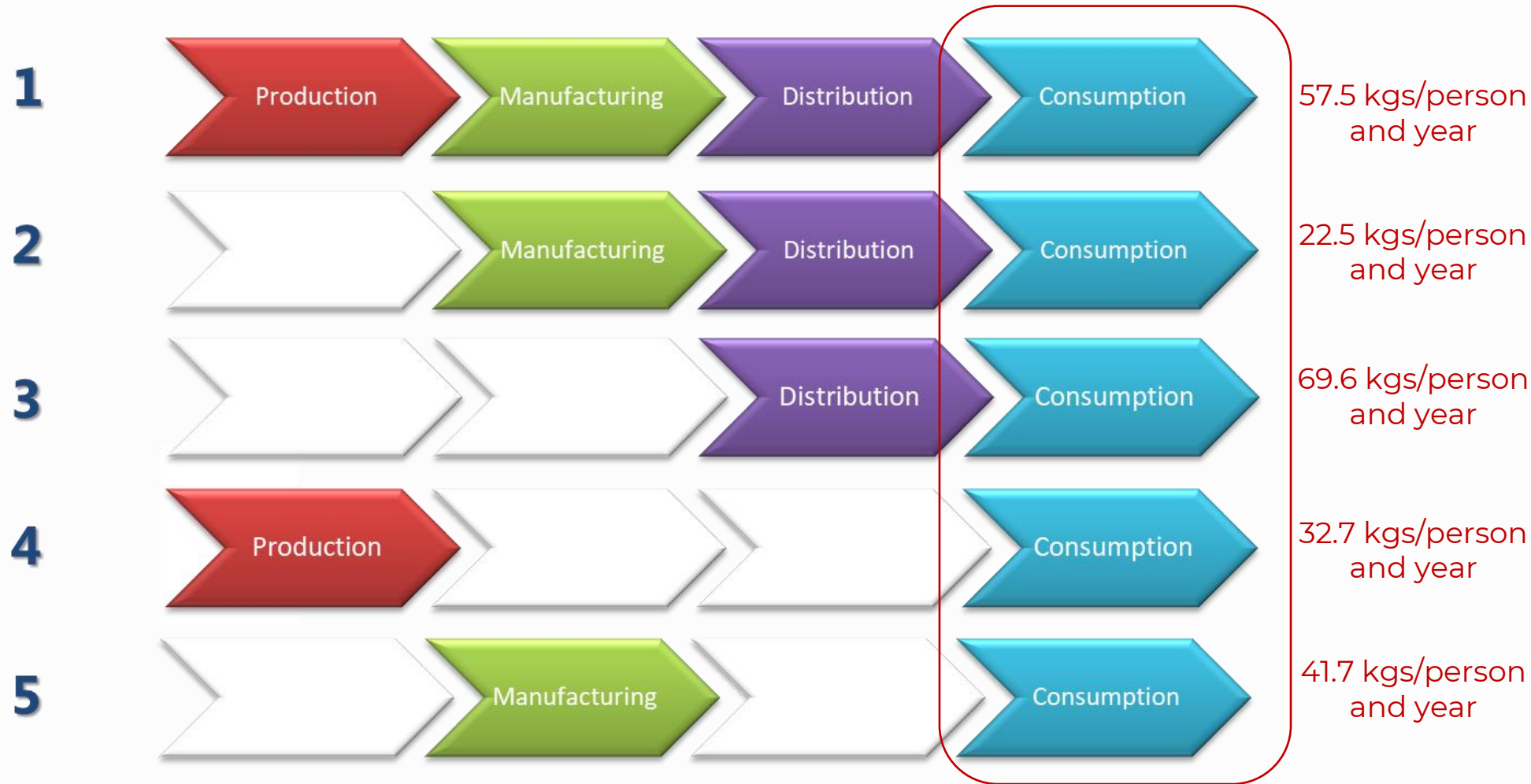


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# Quantification Manual of FL



- WHERE?



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# Quantification Manual of FL



- WHERE?

**1**



57.5 kgs/person  
and year

**2**



22.5 kgs/person  
and year

**3**



69.6 kgs/person  
and year

**4**



32.7 kgs/person  
and year

**5**



41.7 kgs/person  
and year



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# Quantification Manual of FL



- WHERE?



1



57.5 kgs/person  
and year

2



22.5 kgs/person  
and year

3



69.6 kgs/person  
and year

4



32.7 kgs/person  
and year

5



41.7 kgs/person  
and year

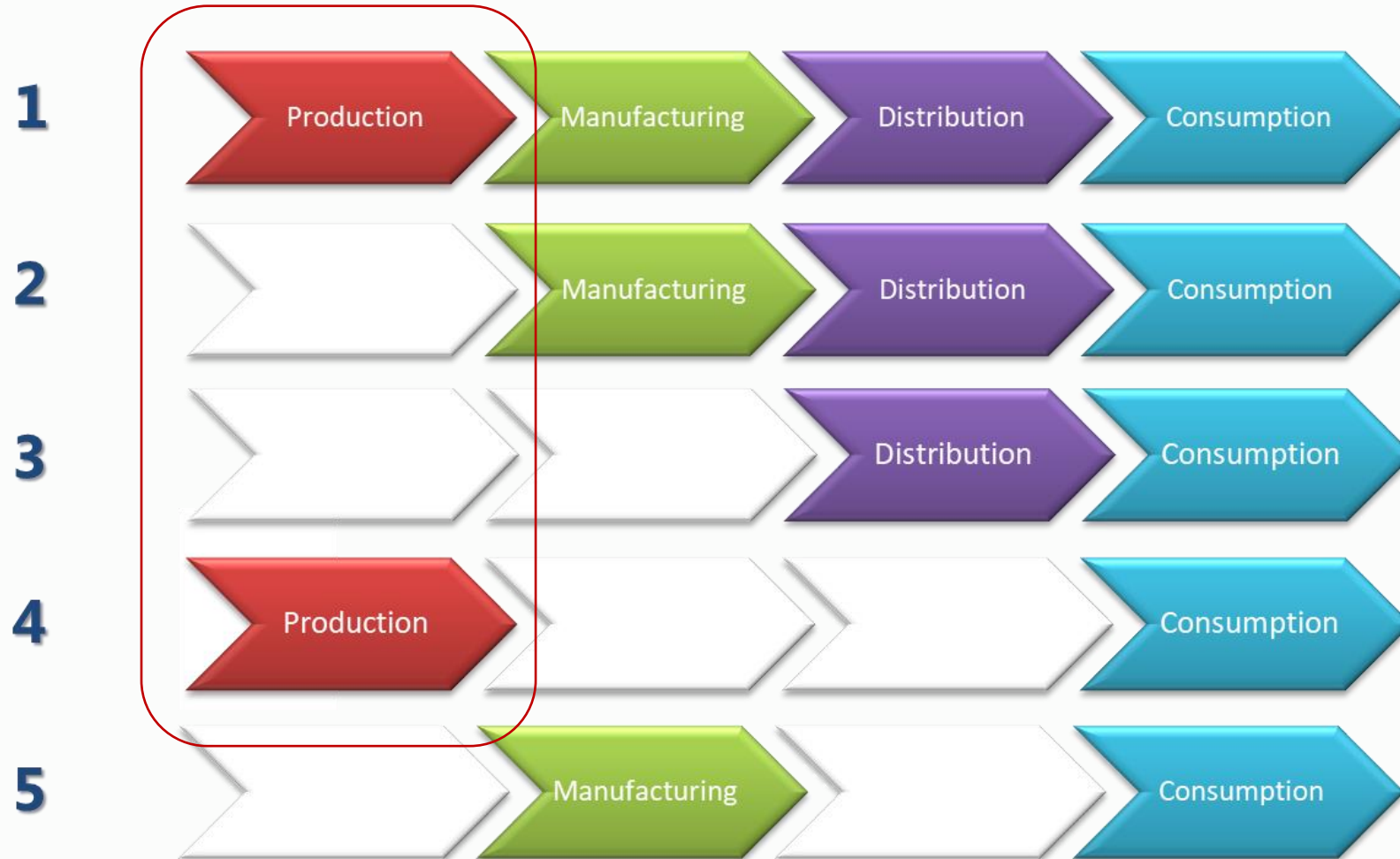


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- WHERE?



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Losses in primary  
production

Losses in primary  
production





Losses in crops,  
meat products  
and fisheries

Losses only in  
perennial crops



# Quantification Manual of FL



- WHERE?

27.9.2019

EN

Official Journal of the European Union

L 248/77

**COMMISSION DELEGATED DECISION (EU) 2019/1597**

**of 3 May 2019**

**supplementing Directive 2008/98/EC of the European Parliament and of the Council as regards  
a common methodology and minimum quality requirements for the uniform measurement of  
levels of food waste**



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# FL Quantification Manual

## - WHERE?

ANNEX I

**Attribution of food waste to the different stages of the food supply chain**

Stages of the food supply chain	Relevant item in Waste Statistics <sup>(1)</sup> which include given stage of food supply chain	Activity which generates waste	
		Relevant NACE Rev. 2 code	Description
Primary production	Part of Item 1	Section A	Agriculture, forestry and fishing
		Division 01	Crop and animal production, hunting and related service activities
		Division 03	Fishing and aquaculture
Processing and manufacturing	Part of Item 3	Section C	Manufacturing
		Division 10	Manufacture of food products
		Division 11	Manufacture of beverages
Retail and other distribution of food	Part of Item 17	Section G	Wholesale and retail trade; repair of motor vehicles and motorcycles
		Division 46	Wholesale trade, except of motor vehicles and motorcycles
		Division 47	Retail trade, except of motor vehicles and motorcycles
Restaurants and food services	Part of Item 17	Section I	Accommodation and food service activities
		Division 55	Accommodation
		Division 56	Food and beverage service activities
		Sections N, O, P, Q, R, S	
		Divisions covering activities in which food services are provided (such as staff catering, healthcare, education, travel catering).	
Households	Item 19	'Households' as referred to in Annex I Section 8 point 1.2 to Regulation (EC) No 2150/2002 on waste statistics	Waste generated by households

<sup>(1)</sup> Point 1 of Section 8 of Annex I to Regulation (EC) No 2150/2002.

27.9.2019

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Official Journal of the European Union

L 248/81



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# FL Quantification Manual

## - WHERE?

ANNEX I

**Attribution of food waste to the different stages of the food supply chain**

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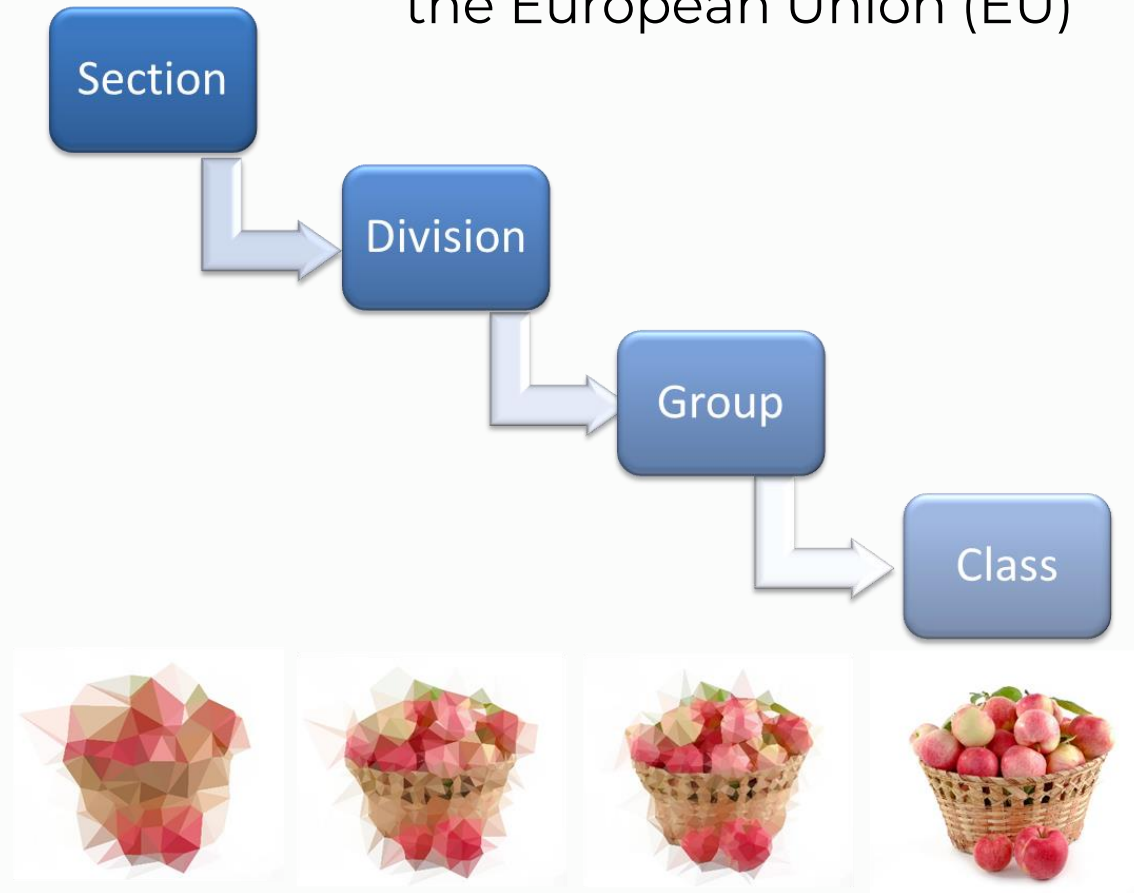
# FL Quantification Manual



## - WHERE?

**NACE** = classification of economic activities in the European Union (EU)

General structure of the NACE Coding



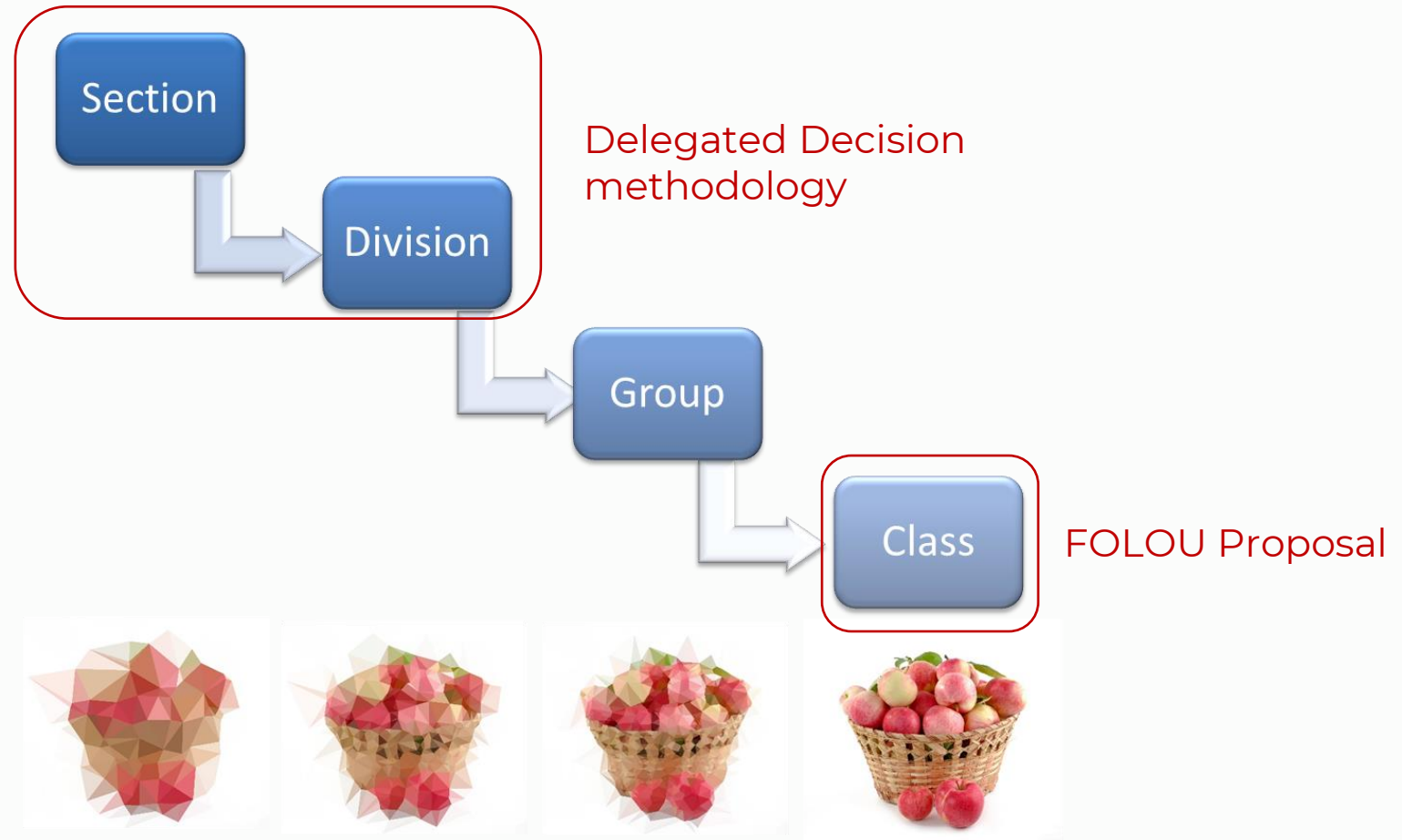
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## - WHERE?

General structure of the NACE Coding



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# FL Quantification Manual



## - WHERE?

ANNEX I			
Attribution of food waste to the different stages of the food supply chain			
Stages of the food supply chain	Relevant item in Waste Statistics <sup>(1)</sup> which include given stage of food supply chain	Activity which generates waste	
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Primary production	Part of Item 1	Section A	Agriculture, forestry and fishing
		Division 01	Crop and animal production, hunting and related service activities
		Division 03	Fishing and aquaculture

27.9.2019

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## Detailed Structure of NACE Rev. 2

n.e.c. : not elsewhere classified				* part of
Division	Group	Class		ISIC Rev. 4
<b>SECTION A — AGRICULTURE, FORESTRY AND FISHING</b>				
<b>01</b>			Crop and animal production, hunting and related service activities	
	01.1		Growing of non-perennial crops	
		01.11	Growing of cereals (except rice), leguminous crops and oil seeds	0111
		01.12	Growing of rice	0112
		01.13	Growing of vegetables and melons, roots and tubers	0113
		01.14	Growing of sugar cane	0114
		01.15	Growing of tobacco	0115
		01.16	Growing of fibre crops	0116
		01.19	Growing of other non-perennial crops	0119
	01.2		Growing of perennial crops	
		01.21	Growing of grapes	0121
		01.22	Growing of tropical and subtropical fruits	0122
		01.23	Growing of citrus fruits	0123
		01.24	Growing of pome fruits and stone fruits	0124
		01.25	Growing of other tree and bush fruits and nuts	0125
		01.26	Growing of oleaginous fruits	0126
		01.27	Growing of beverage crops	0127
		01.28	Growing of spices, aromatic, drug and pharmaceutical crops	0128
		01.29	Growing of other perennial crops	0129
	01.3		Plant propagation	
		01.30	Plant propagation	0130
	01.4		Animal production	
		01.41	Raising of dairy cattle	0141*
		01.42	Raising of other cattle and buffaloes	0141*
		01.43	Raising of horses and other equines	0142
		01.44	Raising of camels and camelids	0143
		01.45	Raising of sheep and goats	0144
		01.46	Raising of swine/pigs	0145
		01.47	Raising of poultry	0146
		01.49	Raising of other animals	0149
	01.5		Mixed farming	
		01.50	Mixed farming	0150
	01.6		Support activities to agriculture and post-harvest crop activities	
		01.61	Support activities for crop production	0161
		01.62	Support activities for animal production	0162
		01.63	Post-harvest crop activities	0163
		01.64	Seed processing for propagation	0164
	01.7		Hunting, trapping and related service activities	
		01.70	Hunting, trapping and related service activities	0170

# Detailed Structure of NACE Rev. 2

n.e.c. : not elsewhere classified				* part of
Division	Group	Class		ISIC Rev. 4
SECTION A — AGRICULTURE, FORESTRY AND FISHING				
01			Crop and animal production, hunting and related service activities	
	01.1		Growing of non-perennial crops	
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		01.19	Growing of other non-perennial crops	0119
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		01.26	Growing of oleaginous fruits	0126
		01.27	Growing of beverage crops	0127
		01.28	Growing of spices, aromatic, drug and pharmaceutical crops	0128
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		01.62	Support activities for animal production	0162
		01.63	Post-harvest crop activities	0163
		01.64	Seed processing for propagation	0164
	01.7		Hunting, trapping and related service activities	
		01.70	Hunting, trapping and related service activities	0170



## Detailed Structure of NACE Rev. 2

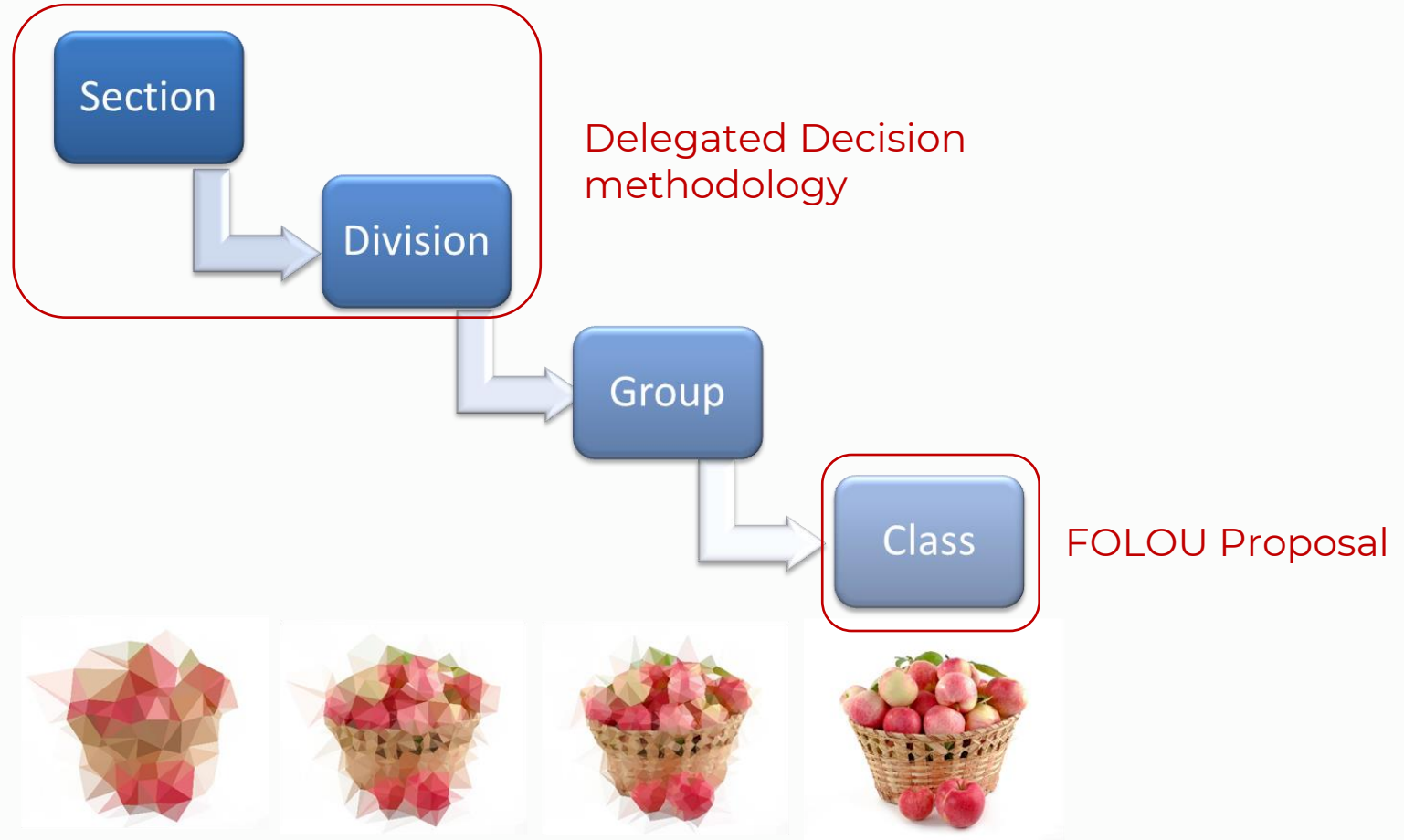
Division	Group	Class	n.e.c. : not elsewhere classified	* part of ISIC Rev. 4
<b>SECTION A — AGRICULTURE, FORESTRY AND FISHING</b>				
<b>01</b>	<b>01.1</b>		Crop and animal production, hunting and related service activities	
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		<b>01.30</b>	<b>Plant propagation</b>	<b>0130</b>
	<b>01.4</b>		Animal production	
		01.41	Raising of dairy cattle	0141*
		01.42	Raising of other cattle and buffaloes	0141*
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		01.45	Raising of sheep and goats	0144
		01.46	Raising of swine/pigs	0145
		01.47	Raising of poultry	0146
		01.49	Raising of other animals	0149
	<b>01.5</b>		Mixed farming	
		01.50	Mixed farming	0150
	<b>01.6</b>		Support activities to agriculture and post-harvest crop activities	
		01.61	Support activities for crop production	0161
		01.62	Support activities for animal production	0162
		01.63	Post-harvest crop activities	0163
		<b>01.64</b>	<b>Seed processing for propagation</b>	<b>0164</b>
	<b>01.7</b>		Hunting, trapping and related service activities	
		01.70	Hunting, trapping and related service activities	0170

# FL Quantification Manual



## - WHERE?

General structure of the NACE Coding



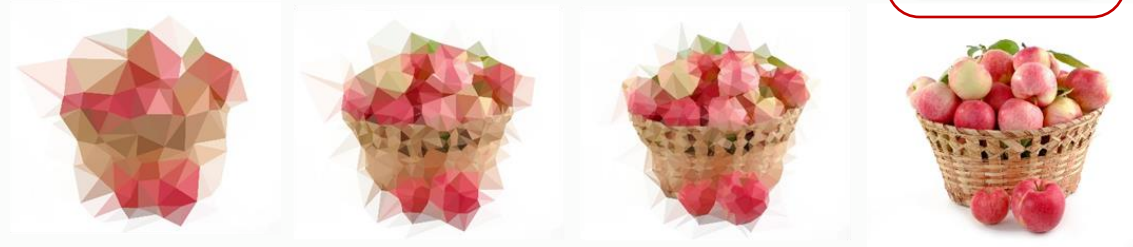
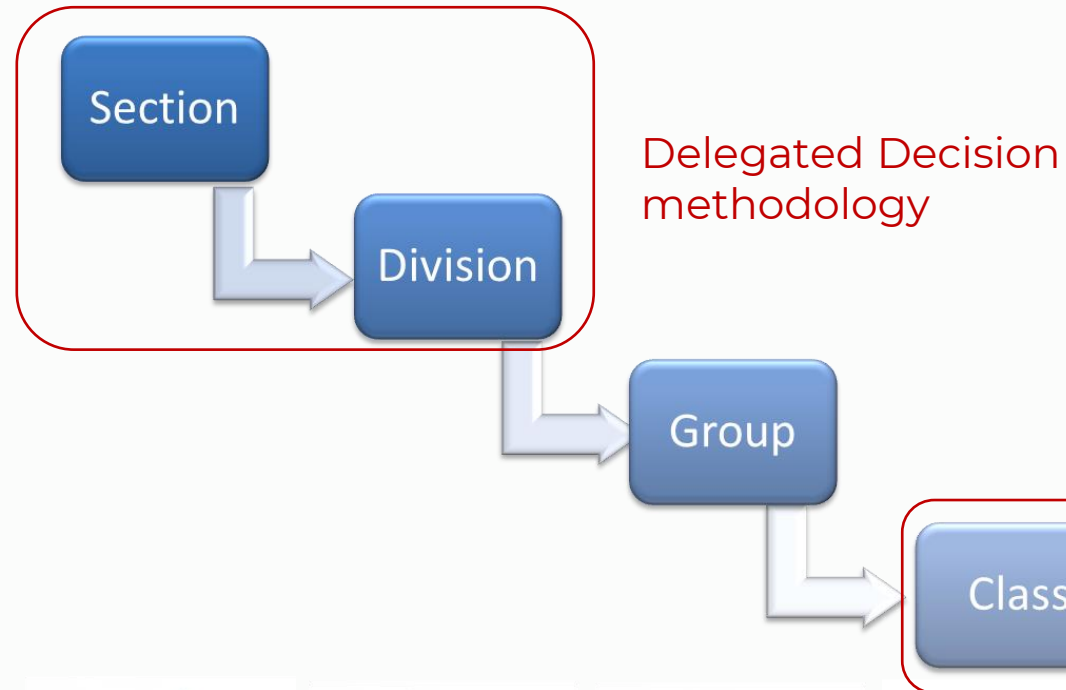
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# FL Quantification Manual



## - WHERE?

General structure of the NACE Coding



... **And beyond:**  
FOLOU Proposal

↓  
Classification of  
Products by Activity  
(CPA)



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## Detailed Structure of NACE Rev. 2

n.e.c. : not elsewhere classified			* part of ISIC Rev. 4
Division	Group	Class	
<b>SECTION A — AGRICULTURE, FORESTRY AND FISHING</b>			
<b>01</b>		Crop and animal production, hunting and related service activities	
	<b>01.1</b>	Growing of non-perennial crops	
		<b>01.11 Growing of cereals (except rice), leguminous crops and oil seeds</b>	<b>0111</b>
		01.12 Growing of rice	0112
		01.13 Growing of vegetables and melons, roots and tubers	0113
		01.14 Growing of sugar cane	0114
		01.15 Growing of tobacco	0115
		01.16 Growing of fibre crops	0116
		01.19 Growing of other non-perennial crops	0119
	<b>01.2</b>	Growing of perennial crops	
		01.21 Growing of grapes	0121
		01.22 Growing of tropical and subtropical fruits	0122
		01.23 Growing of citrus fruits	0123
		01.24 Growing of pome fruits and stone fruits	0124
		01.25 Growing of other tree and bush fruits and nuts	0125
		01.26 Growing of oleaginous fruits	0126
		01.27 Growing of beverage crops	0127
		01.28 Growing of spices, aromatic, drug and pharmaceutical crops	0128
		01.29 Growing of other perennial crops	0129
	<b>01.3</b>	Plant propagation	
		01.30 Plant propagation	0130
	<b>01.4</b>	Animal production	
		01.41 Raising of dairy cattle	0141*
		01.42 Raising of other cattle and buffaloes	0141*
		01.43 Raising of horses and other equines	0142
		01.44 Raising of camels and camelids	0143
		01.45 Raising of sheep and goats	0144
		01.46 Raising of swine/pigs	0145
		01.47 Raising of poultry	0146
		01.49 Raising of other animals	0149
	<b>01.5</b>	Mixed farming	
		01.50 Mixed farming	0150
	<b>01.6</b>	Support activities to agriculture and post-harvest crop activities	
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		01.63 Post-harvest crop activities	0163
		01.64 Seed processing for propagation	0164
	<b>01.7</b>	Hunting, trapping and related service activities	
		01.70 Hunting, trapping and related service activities	0170



# FL Quantification Manual

## - WHERE?

... And beyond:  
FOLOU Proposal

### Improvement using Classification of Products by Activity (CPA)

NACE Classes approach	CPA approach	CPA approach 2
D 01.11 - Growing of cereals (except rice), leguminous crops and oil seeds	01.11.1 Wheat	01.11.11 Durum wheat
		01.11.12 Wheat, except durum wheat
	01.11.2 Maize	01.11.20 Maize
	01.11.3 Barley, rye and oats	01.11.31 Barley
		01.11.32 Rye
		01.11.33 Oats
	01.11.4 Sorghum, millet and other cereals	01.11.41 Sorghum
		01.11.42 Millet
		01.11.49 Other cereals
	01.11.5 Cereals straw and husks	01.11.50 Cereals straw and husks
	01.11.6 Green leguminous vegetables	01.11.61 Beans, green
		01.11.62 Peas, green
	01.11.7 Dried leguminous vegetables	01.11.69 Other green leguminous vegetables
		01.11.71 Beans, dry
		01.11.72 Broad beans, dry
		01.11.73 Chick peas, dry
		01.11.74 Lentils, dry
		01.11.75 Peas, dry
		01.11.79 Pulses (dried leguminous vegetables)
		n.e.c.

# FL Quantification Manual

- WHERE?

... And beyond:  
FOLOU Proposal

## Improvement using Classification of Products by Activity (CPA)




NACE Classes approach	CPA approach	CPA approach 2
D 01.11 - Growing of cereals (except rice), leguminous crops and oil seeds	01.11.1 Wheat	01.11.11 Durum wheat
	01.11.2 Maize	01.11.12 Wheat, except durum wheat
	01.11.3 Barley, rye and oats	01.11.20 Maize
		01.11.31 Barley
	01.11.4 Sorghum, millet and other cereals	01.11.32 Rye
		01.11.33 Oats
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		01.11.75 Peas, dry
		01.11.79 Pulses (dried leguminous vegetables)
		n.e.c.
1 category	7 categories	19 categories

# FL Quantification Manual

## - WHERE?

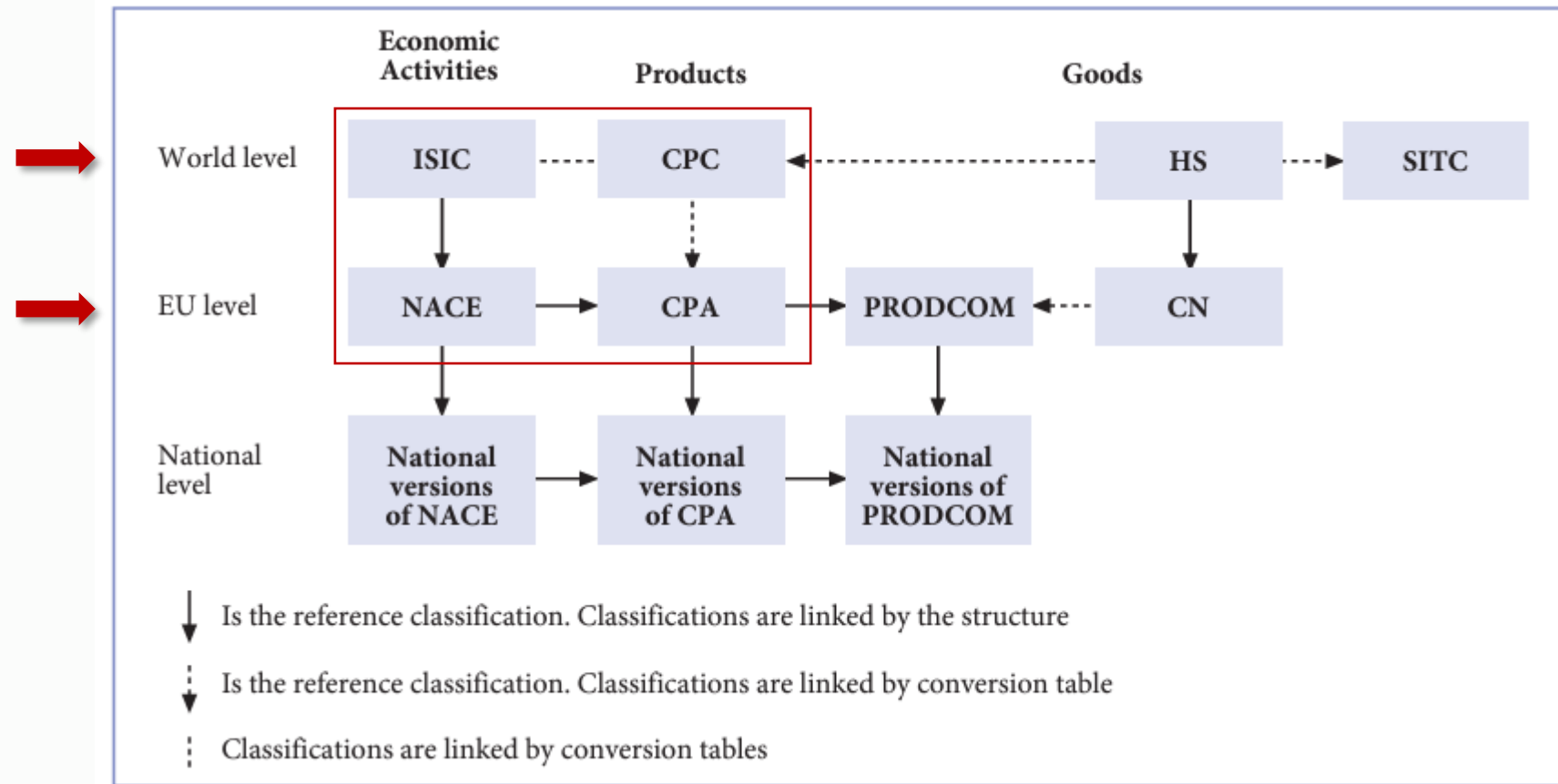
... And beyond:  
FOLOU Proposal

### Improvement using Classification of Products by Activity (CPA)

NACE Classes approach	CPA approach	CPA approach 2
 <b>D 01.11</b> Growing of cereals (except rice), leguminous crops and oil seeds  4-digits code	01.11.1 Wheat  01.11.2 Maize 01.11.3 Barley, rye and oats	01.11.11 Durum wheat  01.11.12 Wheat, except durum wheat 01.11.20 Maize 01.11.31 Barley
	 <b>01.11.4</b> Sorghum, millet and other cereals  5-digits code	 <b>01.11.32</b> Rye 6-digits code  01.11.33 Oats 01.11.41 Sorghum  01.11.42 Millet  01.11.49 Other cereals 01.11.50 Cereals straw and husks 01.11.61 Beans, green  01.11.62 Peas, green 01.11.69 Other green leguminous vegetables 01.11.71 Beans, dry  01.11.72 Broad beans, dry 01.11.73 Chick peas, dry 01.11.74 Lentils, dry 01.11.75 Peas, dry 01.11.79 Pulses (dried leguminous vegetables) n.e.c.
1 category	7 categories	19 categories

# FL Quantification Manual

## - WHERE?



# FL Quantification Manual

## - WHERE?



### RETAIL

- ISIC 47-11** Retail sale in non-specialized stores with food, beverages or tobacco predominating
- ISIC 47-2** Retail sale of food, beverages and tobacco in specialized stores
- ISIC 47-81** Retail sale via stalls and markets of food, beverages and tobacco products

*(Retail excludes ISIC 46-30, Wholesale of food, beverages and tobacco – this is covered under the Food Loss Index.)*

### FOOD SERVICE



involves food waste generated in settings where food is consumed in substantial quantities outside of the home. This could include all of the classifications below. However, for practical purposes, measurement can focus on those where the majority of meals are eaten within a country, for example ISIC 56 and ISIC 85.

- ISIC 49-11** Passenger rail transport, interurban
- ISIC 49-21** Urban and suburban passenger land transport
- ISIC 50-11** Sea and coastal passenger water transport (from food prepared and consumed on voyages and cruises)
- ISIC 50-21** Inland passenger water transport (from food prepared and



### FOOD WASTE INDEX REPORT 2021





# Quantification Manual of FL

## Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

2 main approaches:

Public administration  
(Territorial level)



Cities



Regions



Countries



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# FL Quantification Manual

- HOW?

- 1. Define **priorities** for measuring food losses in the territory

# FL Quantification Manual

- HOW?

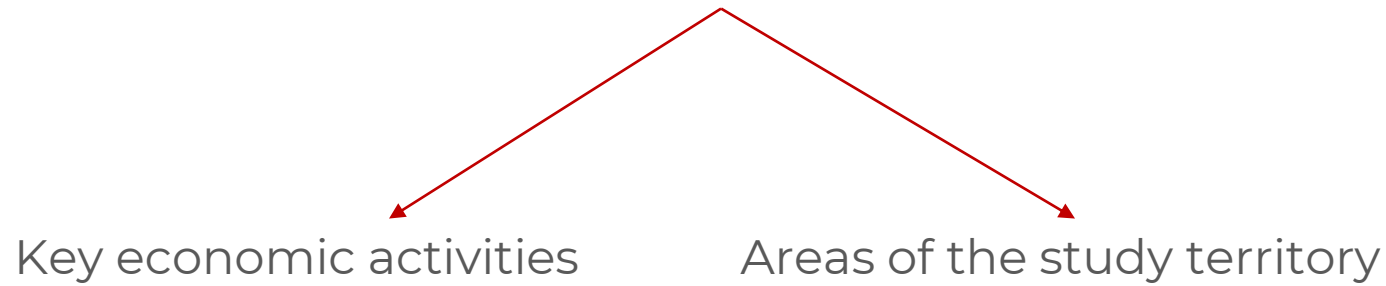
- 1. Define priorities for measuring food losses in the territory



# FL Quantification Manual

- HOW?

- 1. Define priorities for measuring food losses in the territory



# FL Quantification Manual

- HOW?

- 1. Define priorities for measuring food losses in the territory

Key economic activities

Areas of the study territory



# FL Quantification Manual

## - 1. Define **priorities** for measuring food losses in the territory

- 1.1 Determine measurement priorities based on economic activities and product typology in a territory

- Data on the **production volume** of each type of crop in the study area (region/country).
- Information on the extent of **cultivated land** in the study area.
- Information on the **number of farms** in the territory, categorized by 4-digit NACE codes.

+ Recommended



- Recommended



# FL Quantification Manual

## - 1. Define priorities for measuring food losses in the territory

- 1.1 Determine measurement priorities based on economic activities and product typology in a territory

Table 7. Main crops in Region X (NUT 2) in 2023


NACE Classes	Food commodity (CPA)	Total cultivated hectares (ha)	Total annual production (tonnes)
01.11 - Growing of cereals (except rice), leguminous crops and oil seeds	01.11.1 Wheat	160,000	420,000
01.12 - Growing of rice	01.12.10 Rice, not husked	9,750	83,500
01.13 - Growing of vegetables and melons, roots and tubers	01.13.14 Lettuce	5,200	531,500
01.13 - Growing of vegetables and melons, roots and tubers	01.13.51 Potatoes	3,370	99,000
01.13 - Growing of vegetables and melons, roots and tubers	01.13.21 Watermelons	950	47,600
01.23 - Growing of citrus fruits	01.23.13 Oranges	17,380	480,000
01.24 - Growing of pome fruits and stone fruits	01.24.10 Apples	1,980	32,300

# FL Quantification Manual

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# FL Quantification Manual



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Table 8. Main livestock farms in Region X (NUT 2) in 2023

NACE Classes	Food commodity (CPA)	Number of farms	Total annual production (tonnes)
01.47 Raising of poultry	01.47.11 Chickens, live	52	22,150
01.42 Raising of other cattle and buffaloes	01.42.1 Other cattle and buffaloes, live	32	21,400
01.46 Raising of swine/pigs	01.46.10 Swine, live	36	7,925



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# FL Quantification Manual



## - 1. Define priorities for measuring food losses in the territory

- 1.1 Determine measurement priorities based on economic activities and product typology in a territory

Table 8. Main livestock farms in Region X (NUT 2) in 2023

Two red arrows point from the left towards the first two rows of the table.A red arrow points down from the caption area towards the table.

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# FL Quantification Manual



## - 1. Define priorities for measuring food losses in the territory

- 1.1 Determine measurement priorities based on economic activities and product typology in a territory

### Engagement of primary sectors



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# FL Quantification Manual

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### Engagement of primary sectors

Identifying leading sectors





# FL Quantification Manual

- HOW?

- 1. Define priorities for measuring food losses in the territory

Key economic activities

Areas of the study territory

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# FL Quantification Manual

- HOW?

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# FL Quantification Manual

- HOW?

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# FL Quantification Manual



## - 1. Define priorities for measuring food losses in the territory

- 1.2 Establishing areas of the study territory with a higher concentration of these economic activities/food typologies selected



Cover the **largest** number of plots/ farms/companies within the **smallest** area possible



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# FL Quantification Manual

## - 1. Define priorities for measuring food losses in the territory

- 1.2 Establishing areas of the study territory with a higher concentration of these economic activities/food typologies selected

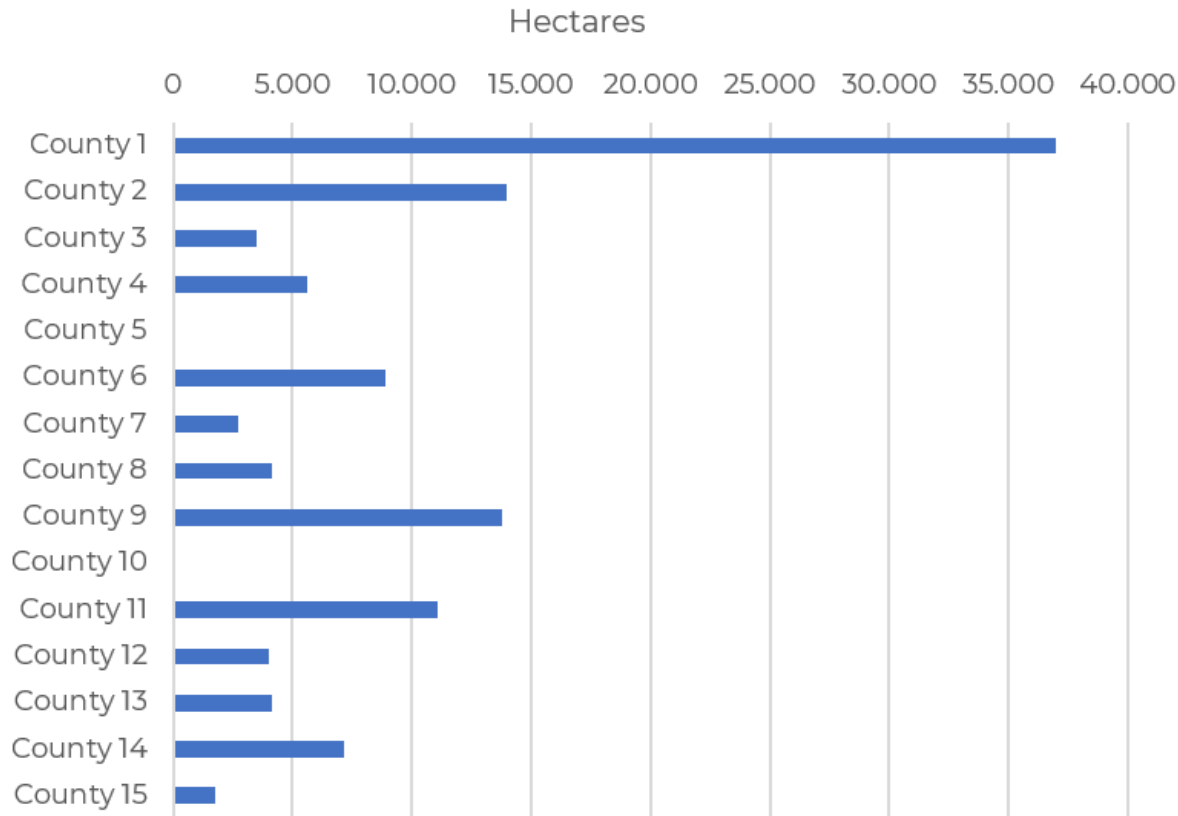


Figure 13. Wheat cultivation area in region X (NUT 2), by counties (NUT 3) and hectares

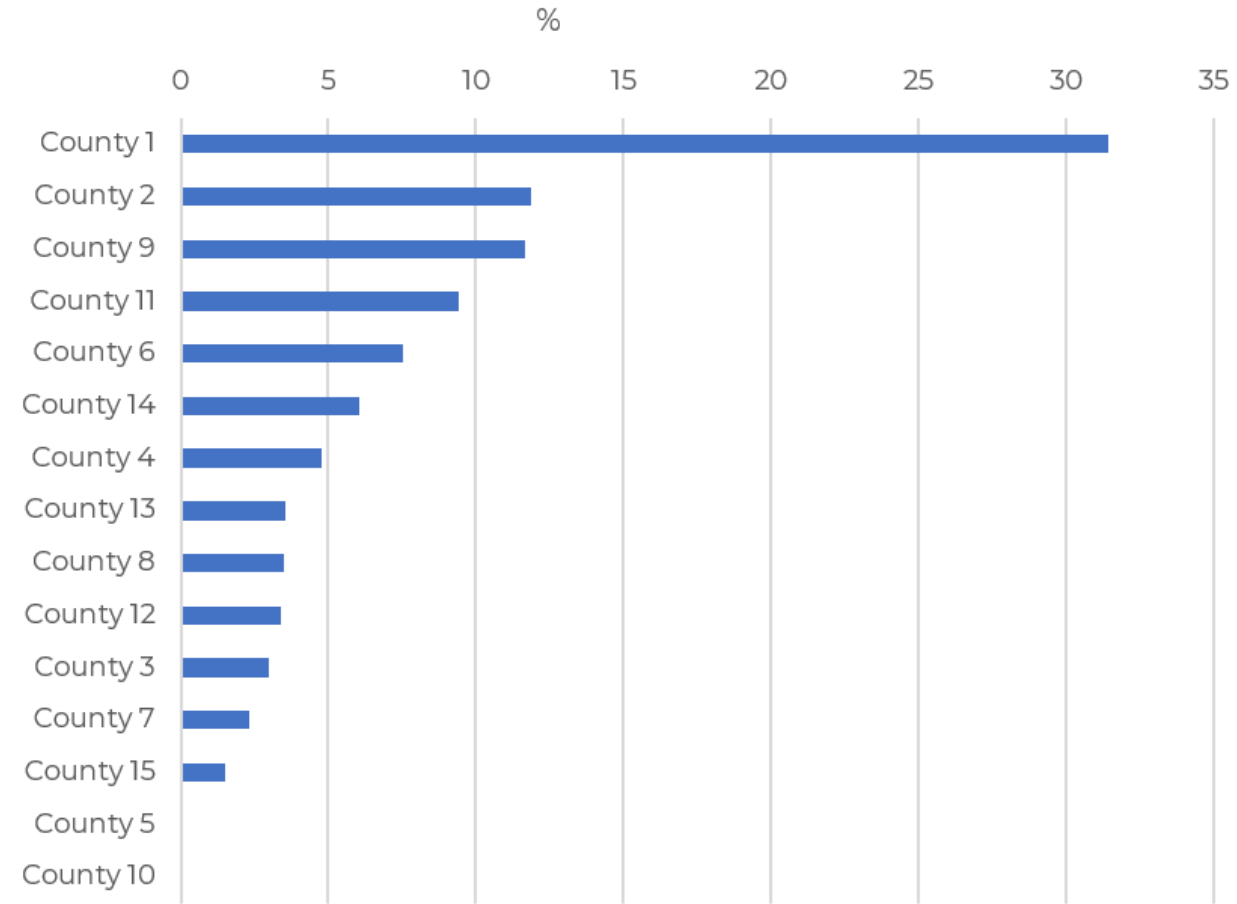


Figure 14. Wheat cultivation area in region X (NUT 2), by counties (NUT 3) and as percentages of the total



# FL Quantification Manual

## - 1. Define priorities for measuring food losses in the territory

- 1.2 Establishing areas of the study territory with a higher concentration of these economic activities/food typologies selected

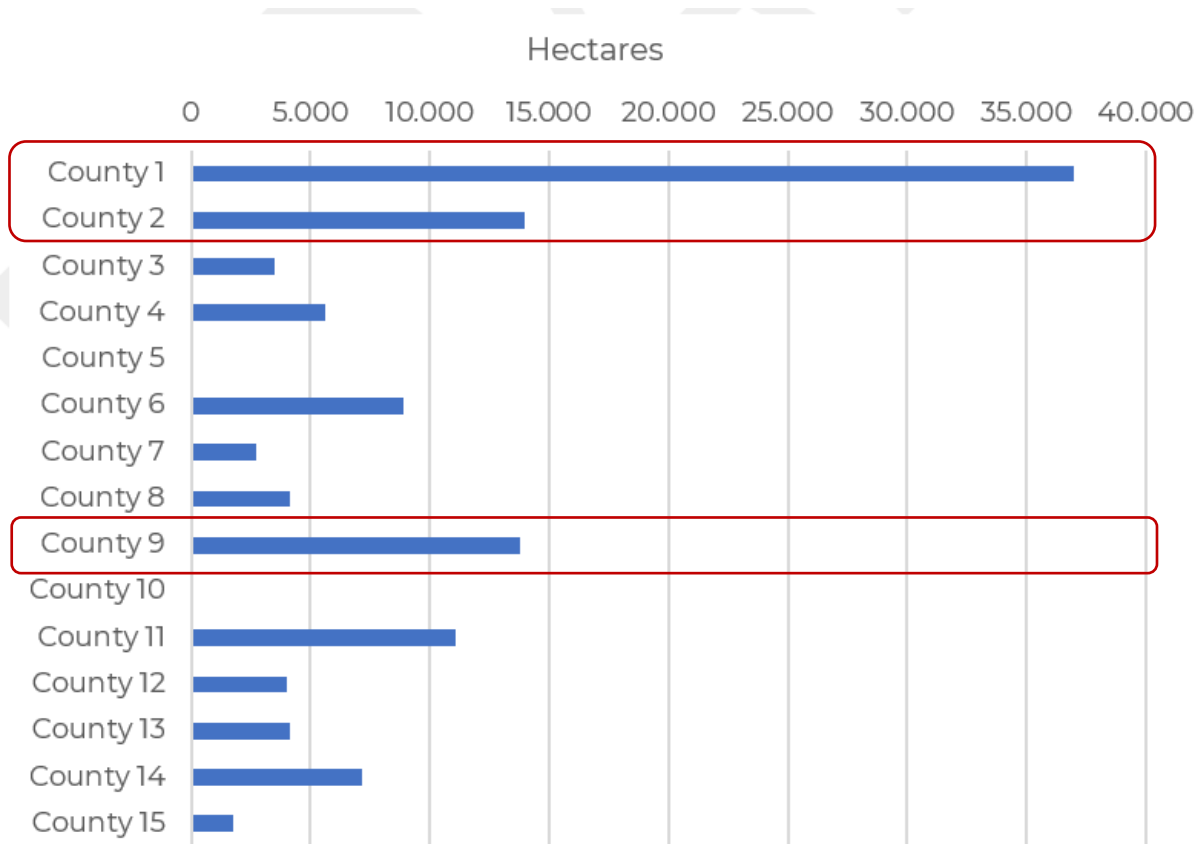


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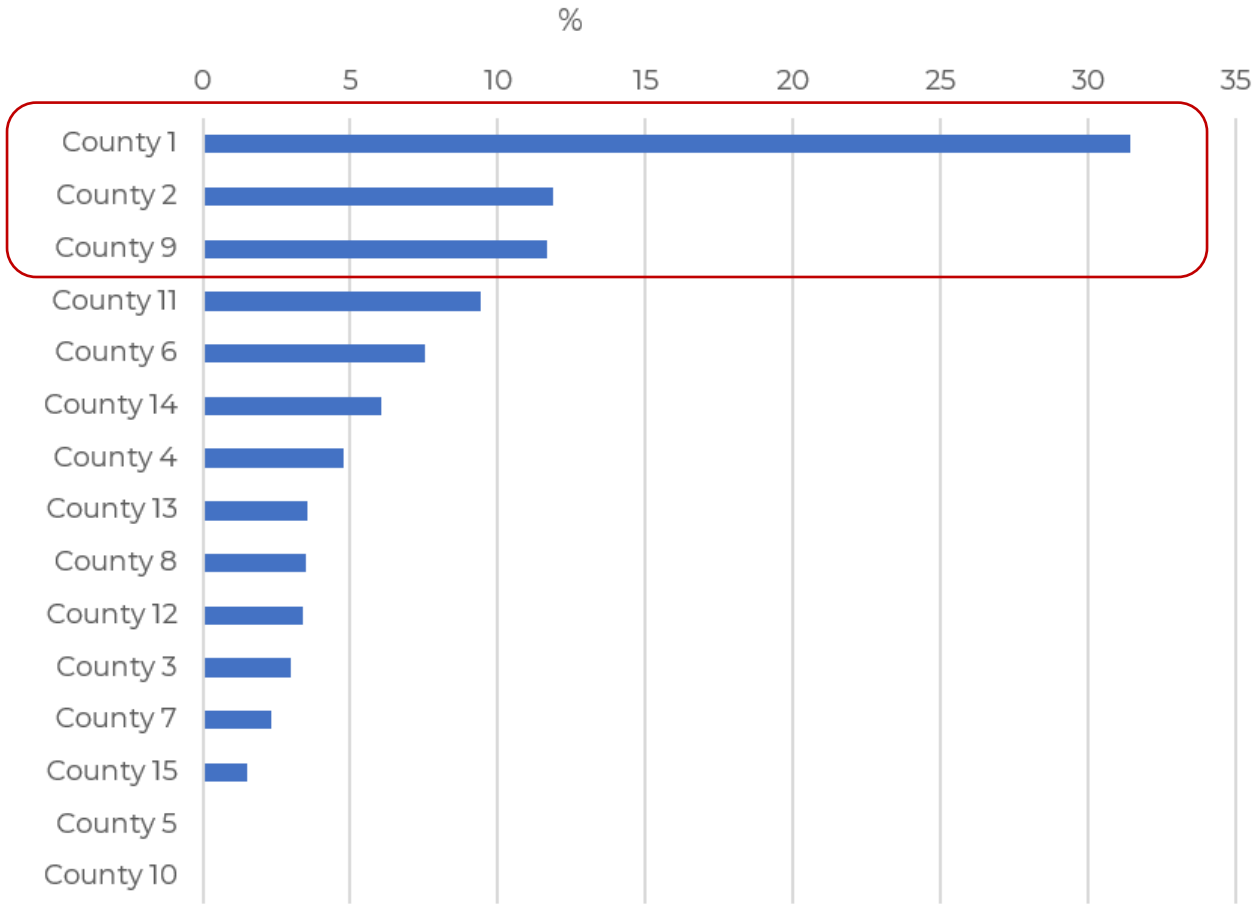


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# FL Quantification Manual

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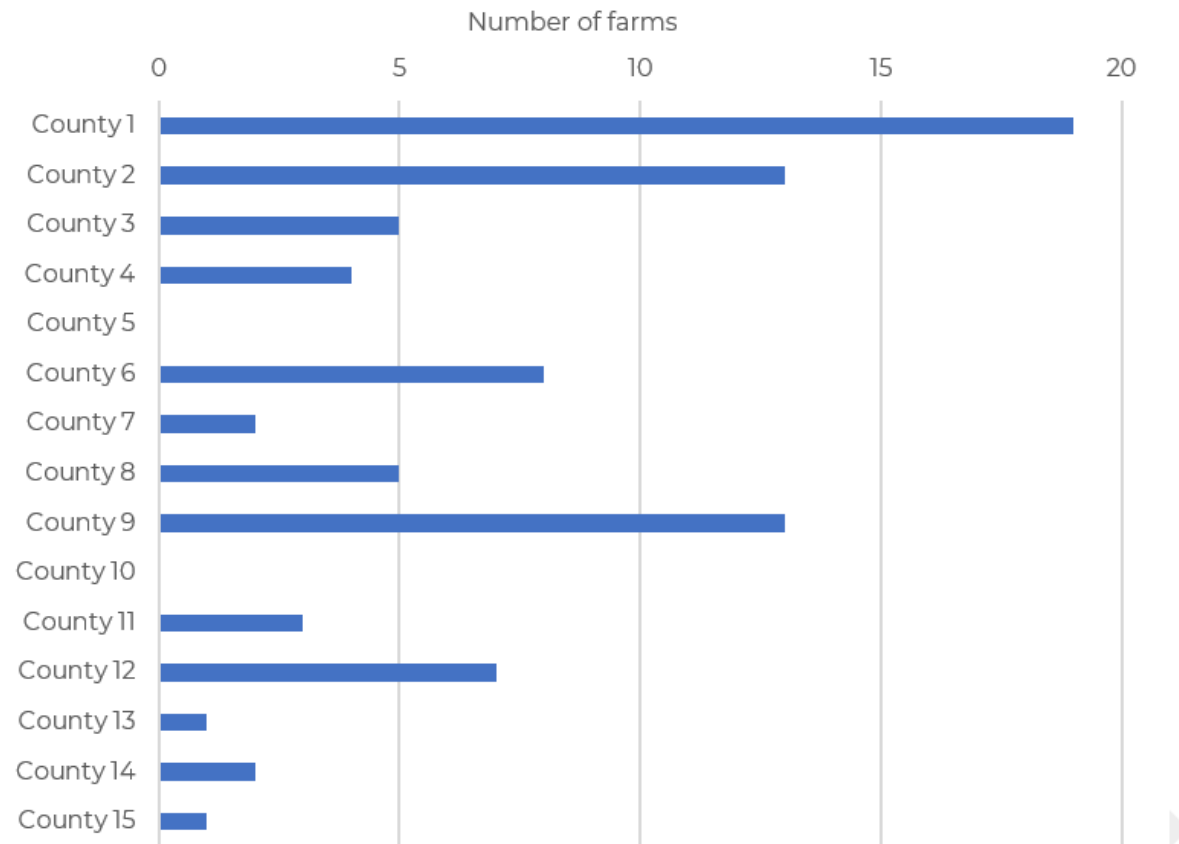


Figure 15. Number of farms producing wheat in region X (NUT 2), by counties (NUT 3)

# FL Quantification Manual

## - 1. Define priorities for measuring food losses in the territory

- 1.2 Establishing areas of the study territory with a higher concentration of these economic activities/food typologies selected

### NACE 0113 - Growing of vegetables, melons, roots and tuber plants

#### List of active companies in County 1

Name	Street	Postal Code	Municipality	Province	NACE Code	X Coordinate	Y Coordinate	Phone Number
Company 1	Street 1	PC1	Municipality 1	Province 1	0113	-0,35156	39,49746	Phone1
Company 2	Street 2	PC1	Municipality 1	Province 1	0113	-0,35182	39,50127	Phone2
Company 3	Street 3	PC2	Municipality 2	Province 1	0113	-0,35073	39,49739	Phone3
Company 4	Street 4	PC3	Municipality 3	Province 1	0113	-0,3332792	39,50959725	Phone4
Company 5	Street 5	PC4	Municipality 4	Province 1	0113	-0,33673301	39,51193	Phone5
Company 6	Street 6	PC4	Municipality 4	Province 1	0113	-0,36084	39,5151	Phone6
Company 7	Street 7	PC5	Municipality 5	Province 1	0113	-0,33907	39,5156	Phone7
Company 8	Street 8	PC6	Municipality 6	Province 1	0113	-0,36554	39,51957	Phone8

# FL Quantification Manual

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# FL Quantification Manual

## - 1. Define priorities for measuring food losses in the territory

- 1.2 Establishing areas of the study territory with a higher concentration of these economic activities/food typologies selected

Geographic Information Systems (GIS)

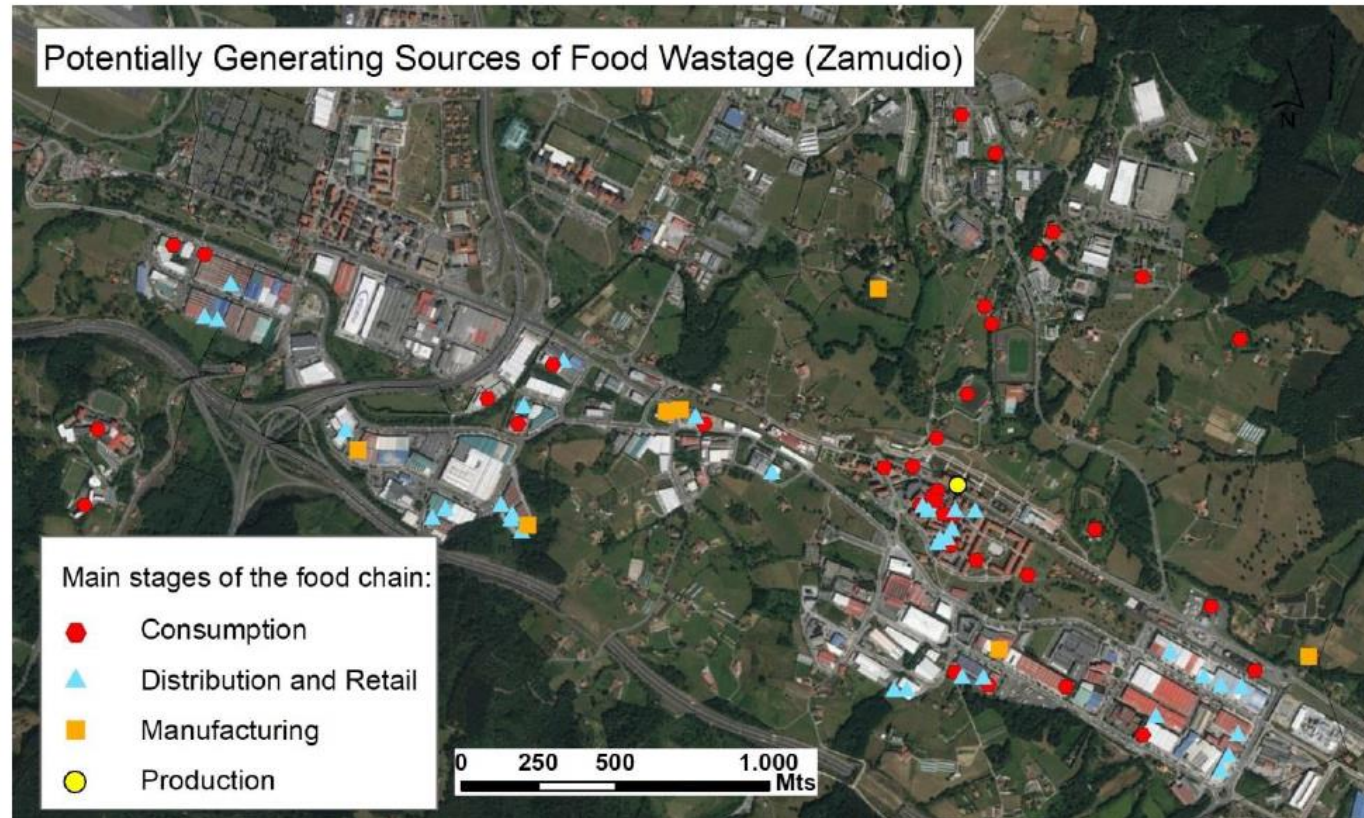
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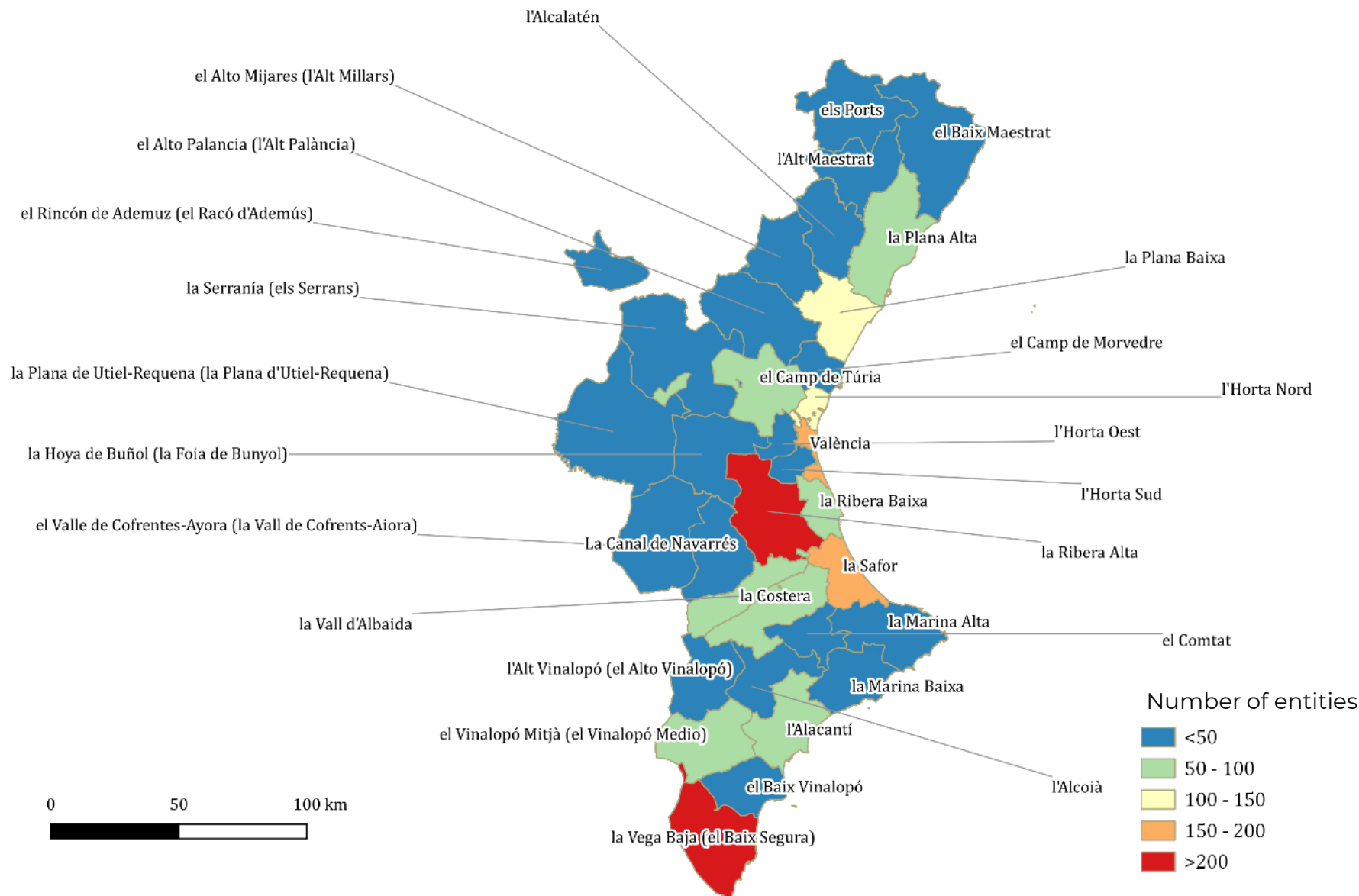
# FL Quantification Manual

- **2. Convert general numbers into specific plots/farms/ponds to be quantified**
- 1.2 Establishing areas of the study territory with a higher concentration of these economic activities/food typologies selected



- Source: Barco, H.; Oribe-Garcia, I.; Vargas-Viedma, M.V.; Borges, C.E.; Martín, C.; Alonso-Vicario, A. New methodology for facilitating food waste quantification. Identifying gaps and data inconsistencies. J. Environ. Manage. 2019, doi:10.1016/j.jenvman.2018.11.037.

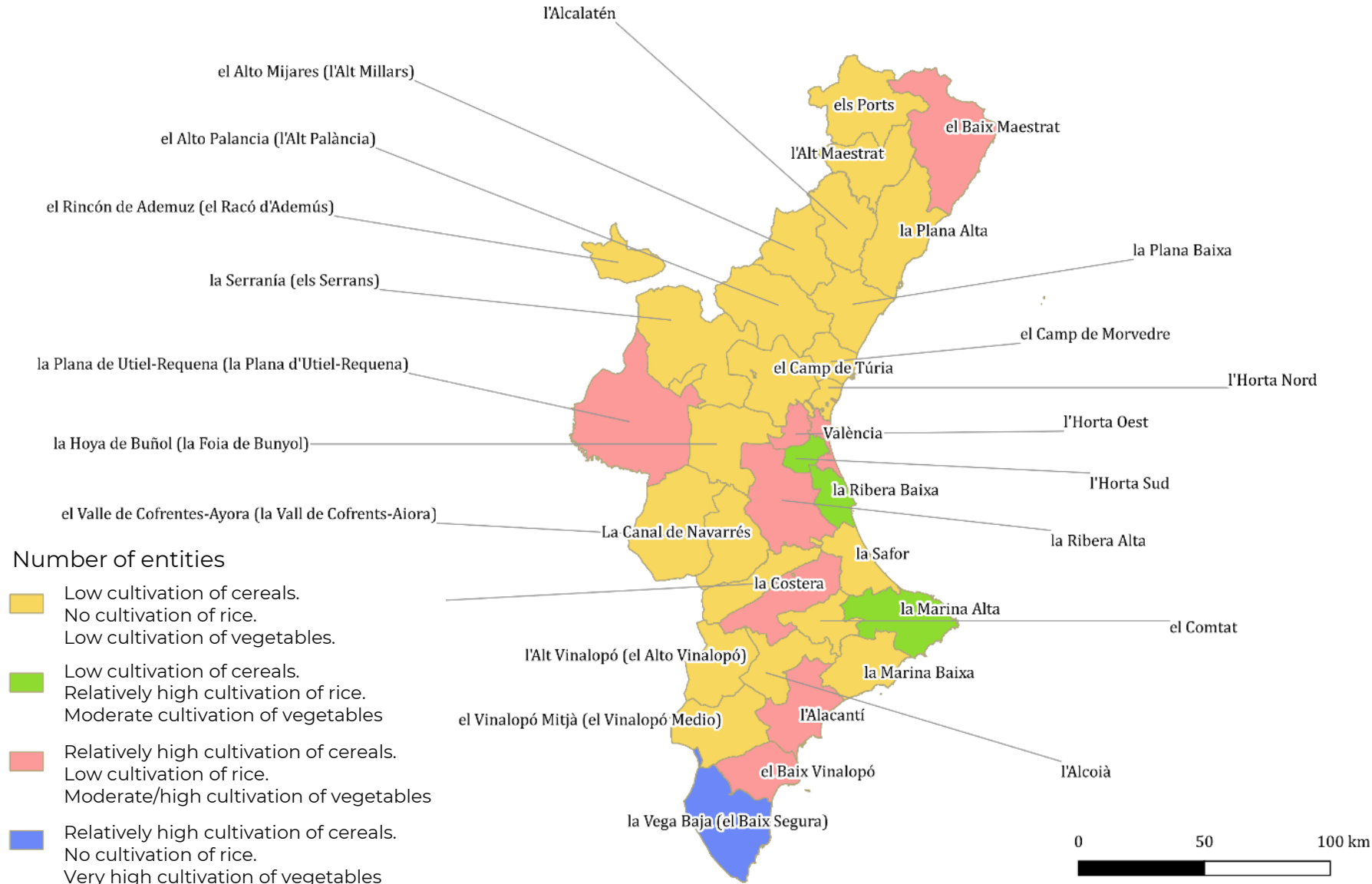
**Number of entities with potential for generating food loss and waste in NACE Class 4631 (Wholesale of fruit and vegetables) in the region of Valencia (NUT2), per counties (NUT3)**



- Source: GVA-Plan\_BonProfit; IVIA; Enraíza-Derechos Diagnóstico normativo y metodológico para impulsar la cuantificación del desperdicio alimentario en la Comunitat Valenciana 2022.



**Characterization of entities with potential for generating food loss and waste in **NACE Group 01.1**  
(Growing of non-perennial crops) in the region of Valencia (NUT2), per counties (NUT3)**



- Source: GVA-Plan\_BonProfit; IVIA; Enraíza-Derechos Diagnóstico normativo y metodológico para impulsar la cuantificación del desperdicio alimentario en la Comunitat Valenciana 2022.

# FL Quantification Manual

- HOW?

- 1. Define priorities for measuring food losses in the territory

Key economic activities

Areas of the study territory

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- County 1
- County 2
- County 7

+50% total cultivated area



# FL Quantification Manual



- HOW?

- 1. Define priorities for measuring food losses in the territory

- 2. Convert **general numbers into specific plots/farms/ponds** to be quantified



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# FL Quantification Manual

- **2. Convert general numbers into specific plots/farms/ponds to be quantified**

# FL Quantification Manual

## - 2. Convert general numbers into specific plots/farms/ponds to be quantified

- 2.1 Using a **database** on different types of crops in a territory, even broken down by NACE or CPA codes

### NACE 0113 - Growing of vegetables, melons, roots and tuber plants

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Company 5	Street 5	PC4	Municipality 4	Province 1	0113	-0,33673301	39,51193	Phone5
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Company 7	Street 7	PC5	Municipality 5	Province 1	0113	-0,33907	39,5156	Phone7
Company 8	Street 8	PC6	Municipality 6	Province 1	0113	-0,36554	39,51957	Phone8

# FL Quantification Manual

## - 2. Convert general numbers into specific plots/farms/ponds to be quantified

- 2.1 Using a database on different types of crops in a territory, even broken down by NACE or CPA codes

### NACE 0113 - Growing of vegetables, melons, roots and tuber plants

#### List of active companies in County 1

Name	Street	Postal Code	Municipality	Province	NACE Code	X Coordinate	Y Coordinate	Phone Number
Company 1	Street 1	PC1	Municipality 1	Province 1	0113	-0,35156	39,49746	Phone1
Company 2	Street 2	PC1	Municipality 1	Province 1	0113	-0,35182	39,50127	Phone2
Company 3	Street 3	PC2	Municipality 2	Province 1	0113	-0,35073	39,49739	Phone3
Company 4	Street 4	PC3	Municipality 3	Province 1	0113	-0,3332792	39,50959725	Phone4
Company 5	Street 5	PC4	Municipality 4	Province 1	0113	-0,33673301	39,51193	Phone5
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Company 4	Street 4	PC3	Municipality 3	Province 1	0113	-0,3332792	39,50959725	Phone4
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# FL Quantification Manual

## - 2. Convert general numbers into specific plots/farms/ponds to be quantified

- 2.2 Select plots/farms/ponds with which there have been **previous collaborative ties**, ensuring cooperation with the processes of measuring food losses

# FL Quantification Manual

- **2. Convert general numbers into specific plots/farms/ponds to be quantified**
  - 2.2 Select plots/farms/ponds with which there have been previous collaborative ties, ensuring cooperation with the processes of measuring food losses

## Engagement of primary sectors

Identifying leading  
farmers/companies/cooperatives



# FL Quantification Manual

## - 2. Convert general numbers into specific plots/farms/ponds to be quantified

- 2.3 The approval of **legal regulations** (national, regional, or local) that compel actors in the chain to measure food losses

# FL Quantification Manual

## - 2. Convert general numbers into specific plots/farms/ponds to be quantified

- 2.3 The approval of legal regulations (national, regional, or local) that compel actors in the chain to measure food losses



**PARLAMENT DE CATALUNYA**

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**Law 3/2020, of 11 March, on Food Loss and Wastage Prevention**

202-00001/12

Adoption

Plenary Assembly of Parliament

Session 50, 04.03.2020, DSPC-P 89

Publication: BOPC 444; DOGC 8084, 13.03.2020

# FL Quantification Manual



- HOW?

- 1. Define priorities for measuring food losses in the territory
- 2. Convert general numbers into specific plots/farms/ponds to be quantified
- 3. **Quantify the food losses** of the agreed plots/farms/ponds



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# FL Quantification Manual

- **3. Quantify the food losses of the agreed parcels/farms/ponds**

# FL Quantification Manual

## - 3. Quantify the food losses of the agreed parcels/farms/ponds

2 main approaches:

- WHAT?
- WHERE?
- HOW?
- WHEN?

Public administration  
(Territorial level)



Farmers, cooperatives or  
Specific research  
(Plot/Farm/Company level)



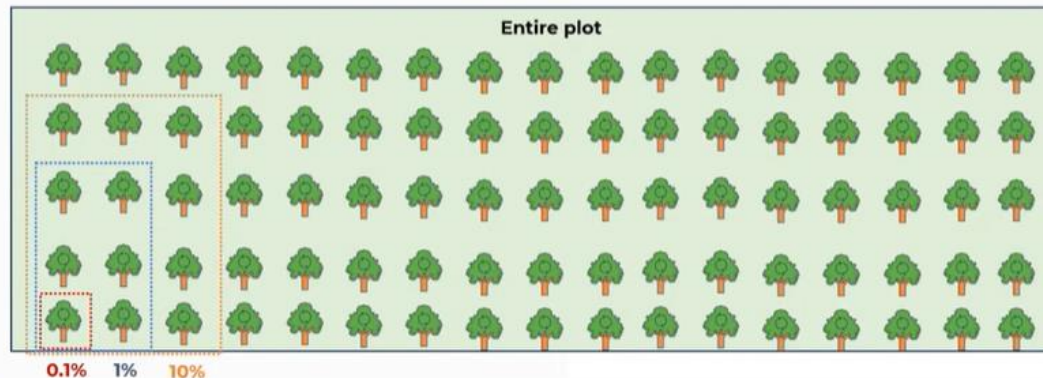
# Webinar II:

## Navigating Reliable Diagnoses for Measuring Food Losses in the Primary Sector of the Supply Chain

Main challenges: 3. Cuts (if applicable. Only crops)



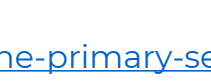
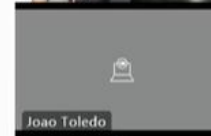
- Sampling area: 0.1% / 1% / 10%
- Cuts (Single / Multiple) (only for crops)



E.g. 3 cuts per year



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# FL Quantification Manual



## - HOW?

- 1. Define priorities for measuring food losses in the territory
- 2. Convert general numbers into specific plots/farms/ponds to be quantified
- 3. Quantify the food losses of the agreed parcels/farms/ponds
- 4. **Extrapolation** of the calculated figures per plot to the total estimated sample in a **territory**



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# FL Quantification Manual

## - 4. Extrapolation of the calculated figures per plot to the total estimated sample in a territory

Table 18. Presentation of the results obtained for all quantified plots on-site. Example of tomato cultivation (CPA 01.13.34) in Region X.

<b>NACE Class</b>	01.13 Growing of vegetables and melons, <u>roots</u> and tubers
<b>CPA Code</b>	01.13.3 Other fruit-bearing vegetables / 01.13.34 Tomatoes
<b>Crop(s)</b>	Tomatoes
<b>Territory</b>	Region X
<b>Type</b>	Sample measured

# FL Quantification Manual

## - 4. Extrapolation of the calculated figures per plot to the total estimated sample in a territory

ID	Total sample size (ha)	Plot size (ha)	Total food losses (tm/ha)	Marketable (tm/ha)	Edible (tm/ha)	Unfit (tm/ha)
27_County_9_A	0.03	1.2	4.12	0.82	1.26	2.04
27_County_9_B	0.03	2.5	6.57	0.97	2.2	3.4
12_County_9_A	0.06	3.9	2.12	0.01	0.9	1.21
12_County_9_B	0.05	1.8	5.82	1.12	1.92	2.78
12_County_9_C	0.02	0.9	3.46	0.54	0.97	1.95
4_County_1_A	0.06	4.2	3.64	0.65	1.12	1.87
5_County_1_A	0.13	7.3	4.57	0.34	1.78	2.45
6_County_1_A	0.07	3.3	4.77	1.67	1.12	1.98
9_County_4_A	0.05	2.9	5.06	1.29	0.65	3.12
9_County_4_B	0.08	4.1	4.31	0.21	0.88	3.22
Min			2.12	0.01	0.65	1.21
Max			6.57	1.67	2.20	3.40
Mean			4.44	0.76	1.28	2.40
Median			4.44	0.74	1.12	2.25
Std dev			1.25	0.52	0.51	0.71



# FL Quantification Manual

## - 4. Extrapolation of the calculated figures per plot to the total estimated sample in a territory

ID	Total sample size (ha)	Plot size (ha)	Total food losses (tm/ha)	Marketable (tm/ha)	Edible (tm/ha)	Unfit (tm/ha)
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# FL Quantification Manual

- 4. Extrapolation of the calculated figures per plot to the total estimated sample in a territory

- Total tomato cultivation area in Region X (2023) = 230 hectares

ID	Total sample size (ha)	Plot size (ha)	Total food losses (tm/ha)	Marketable (tm/ha)	Edible (tm/ha)	Unfit (tm/ha)
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Table 19. Presentation of the results obtained for the estimation of losses in a specific economic activity. Example of tomato cultivation (CPA 01.13.34) in Region X.

NACE Class	01.13 Growing of vegetables and melons, <u>roots</u> and tubers		
CPA Code	01.13.3 Other fruit-bearing vegetables / 01.13.34 Tomatoes		
Crop(s)	Tomatoes		
Territory	Region X		
Type	Estimated total territory		
Total food losses (tm)	Marketable (tm)	Edible (tm/)	Unfit (tm)
1022	175	294	552

# FL Quantification Manual

## - 4. Extrapolation of the calculated figures per plot to the total estimated sample in a territory

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Total food losses (tm)	Marketable (tm)	Edible (tm/)	Unfit (tm)
1022	175	294	552



# Quantification Manual of FL

## Main structure

- WHAT?
- WHERE?
- HOW?
- WHEN?

2 main approaches:

Public administration  
(Territorial level)



Cities



Regions



Countries



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# FL Quantification Manual



- WHEN?



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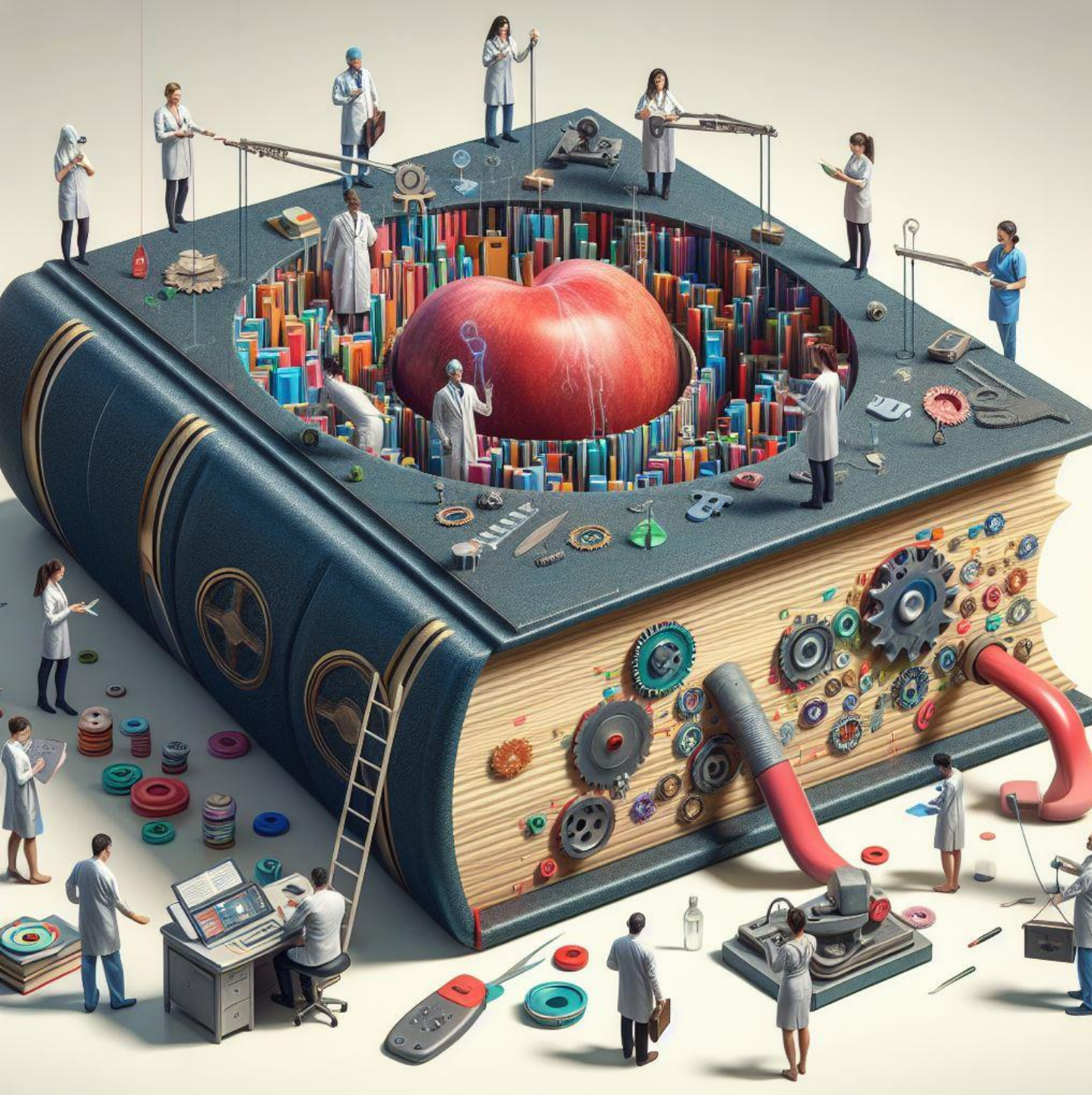
# FL Quantification Manual

## - WHEN?

Emphasize the importance of **measuring over several years** to analyze the complexity of this system, not just on a one-time basis.







Please Don't Panic and  
**STRESS THE MANUAL**



## Dynamic activity





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- FOLOU Definitional Framework of Food Losses
- Quantification Manual of Food Losses



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Emails with  
comments

Attached  
documents with  
comments

Videocalls

Others



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