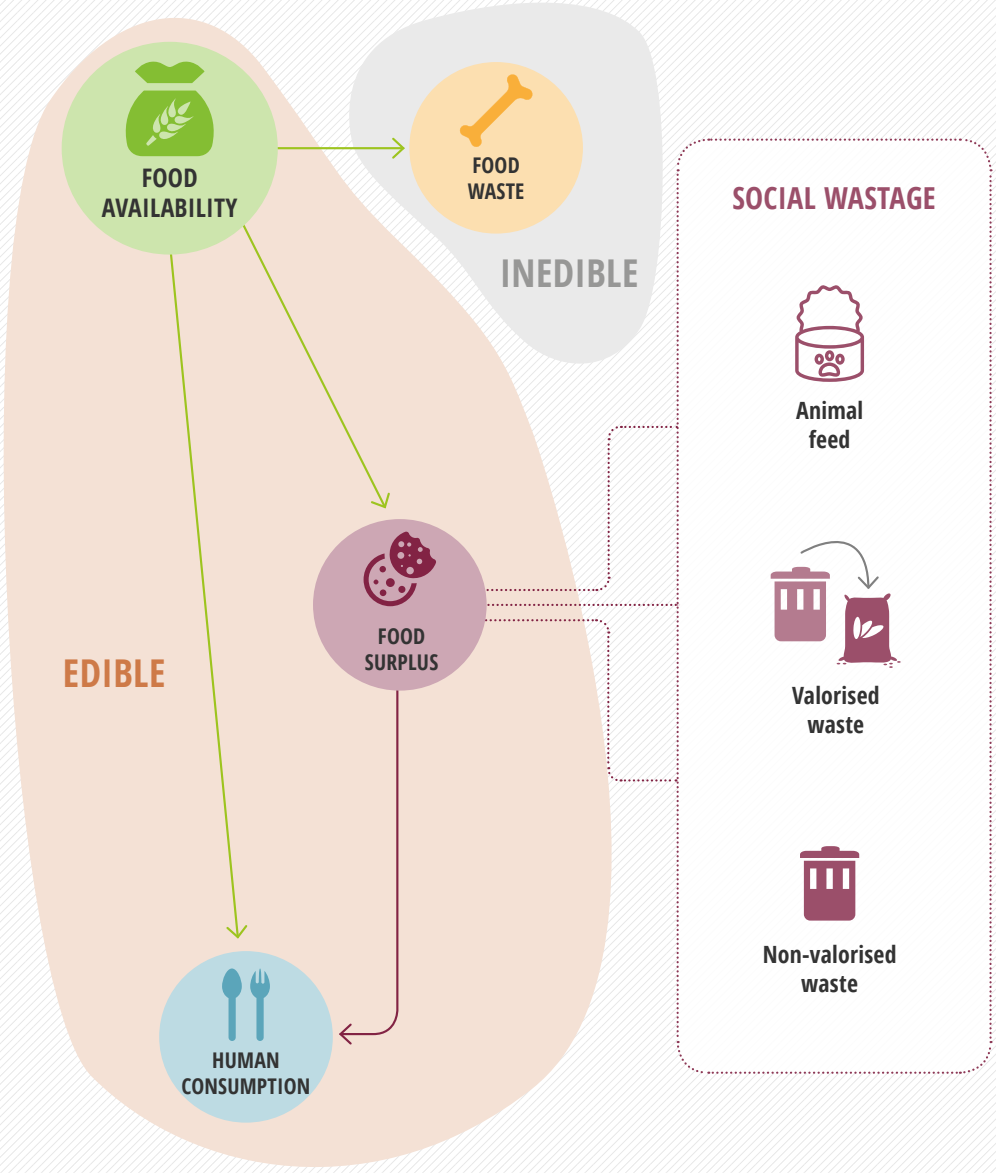
SOCIAL WASTE



Food waste includes non-consumed edible food that is not recovered for human consumption

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2 WHY AND HOW IS WASTE GENERATED

PRIMARY SECTOR

Includes the phases of growing food and livestock.

In the agricultural phase the greatest losses are caused by the weather or by plant diseases, which cause deviations from the standards required by the market.

TRANSFORMATION

The first and second transformations lead to the creation of food products ready to be placed on the market.

During these phases, the losses are caused mainly by the failure of the product to meet quality requirements and products returned by the market.

Waste can take place during **production** (including distribution), or during **consumption**.

However, it is to be noted that flows considered as waste may have very different destinations; while it is very likely that waste produced during the production and the distribution is intended for animal feed or in any case recycled (e.g. energy as biogas or transformation into compost), it is equally likely that the food wasted during the consumption stages is destined for disposal with significant impacts on the environment.

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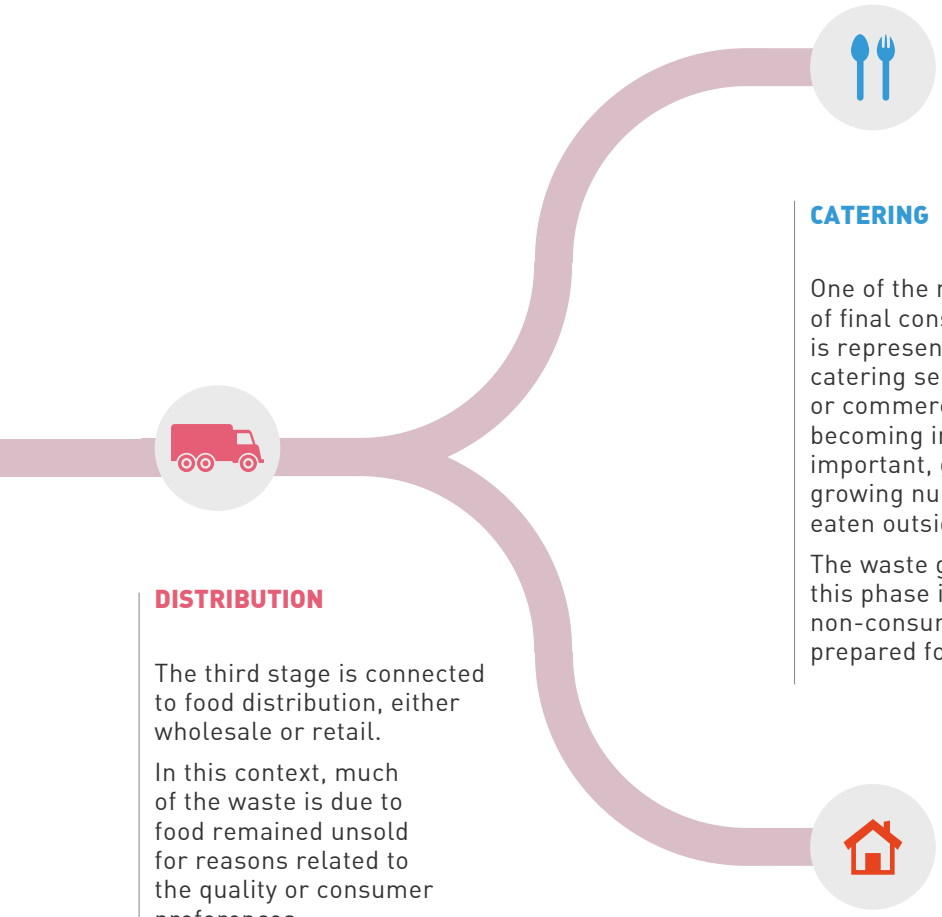

CATERING

One of the methods of final consumption is represented by the catering sector (collective or commercial) which is becoming increasingly important, given the growing number of meals eaten outside the home.

The waste generated in this phase is due to the non-consumption of the prepared food.

DISTRIBUTION

The third stage is connected to food distribution, either wholesale or retail.

In this context, much of the waste is due to food remained unsold for reasons related to the quality or consumer preferences.

FINAL CONSUMER

In the phase of domestic consumption wastes are mainly due to the over abundance of food bought, inability to consume within the expiry-date or proper food conservation.

> THE AGRI-FOOD CHAIN IS DIVIDED INTO SEVERAL STAGES WHICH INCLUDE AGRICULTURAL AND INDUSTRIAL OPERATIONS CHARACTERISED BY DIFFERENT TYPES OF LOSSES AND WASTE.

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3 HOW MUCH FOOD **IS WASTED**

Literature and databases offer a lot of information which is not always comparable due to the different hypothesis that are at the base of the methods of investigation used. In Italy, the first survey on the subject was done in 2011 with the project Last Minute Market[4] which led to an estimated annual waste of average 27% with an economic value of about Euro 1,700 per family[5].

In 2012, the aforementioned study of the Milan Polytechnic has led to an estimated waste equal to 16% of consumption. This second publication is characterised by a greater degree of detail and you can analyse the characteristics of different food categories for the different stages of the supply chain.

The main considerations are:

- the stages where you have the greatest wastage are primary production and consumption;
- breeding is among phases characterised by minor social waste in percentage terms.

SEGMENT OF THE FOOD CHAIN		PRODUCTION [1,000T/YEAR]	SURPLUS		
			TOTAL [1,000T/YEAR]	OF WHICH SOCIAL WASTE [1,000T/YEAR]	
PRIMARY SECTOR	Fruit and Vegetables	41,728	2,187,1	1,948.2	89%
	Cereals	22,031	68.1	67.4	99%
	Breeding	14,989	52.5	20.3	39%
	Fishing	475	10.5	9.4	90%
	Total	74,223	2,318.2	2,045.2	88%
TRANSFORMATION	Ambient Temperature	34,641	118.2	36.1	30%
	Fresh	8,553	51.5	33.5	65%
	Frozen	1,592	11.7	11.4	97%
	Total	44,786	181.4	81	45%
DISTRIBUTION	Distributive centres	24,524	73.6	47.8	65%
	Points of sale	30,665	704.0	671.3	95%
	Total	55,189	777.6	719.1	92%
CATERING	Collective	869	86.9	73.8	85%
	Commercial	2,443	122.2	116.1	95%
	Total	3,312	209.1	189.9	91%
FINAL CONSUMPTION	-	31,268	2,513.5	2,513.5	100%
TOTAL	-	**213,778**	**6,000.0**	**5,548**	**92%**

Summary of the quantitative results of the survey "Feed the hungry" of the Milan Polytechnic. For the main phases of the chain the production, the surplus (i.e. the edible part of the food that is not consumed) and social waste (i.e. the excess not recovered for human consumption) are reported. The data relating to Italy, are reported both in quantity (t/year) and percentage. The surplus is calculated relative to production and waste is calculated relative to surplus). (Source: Garrone, 2012)

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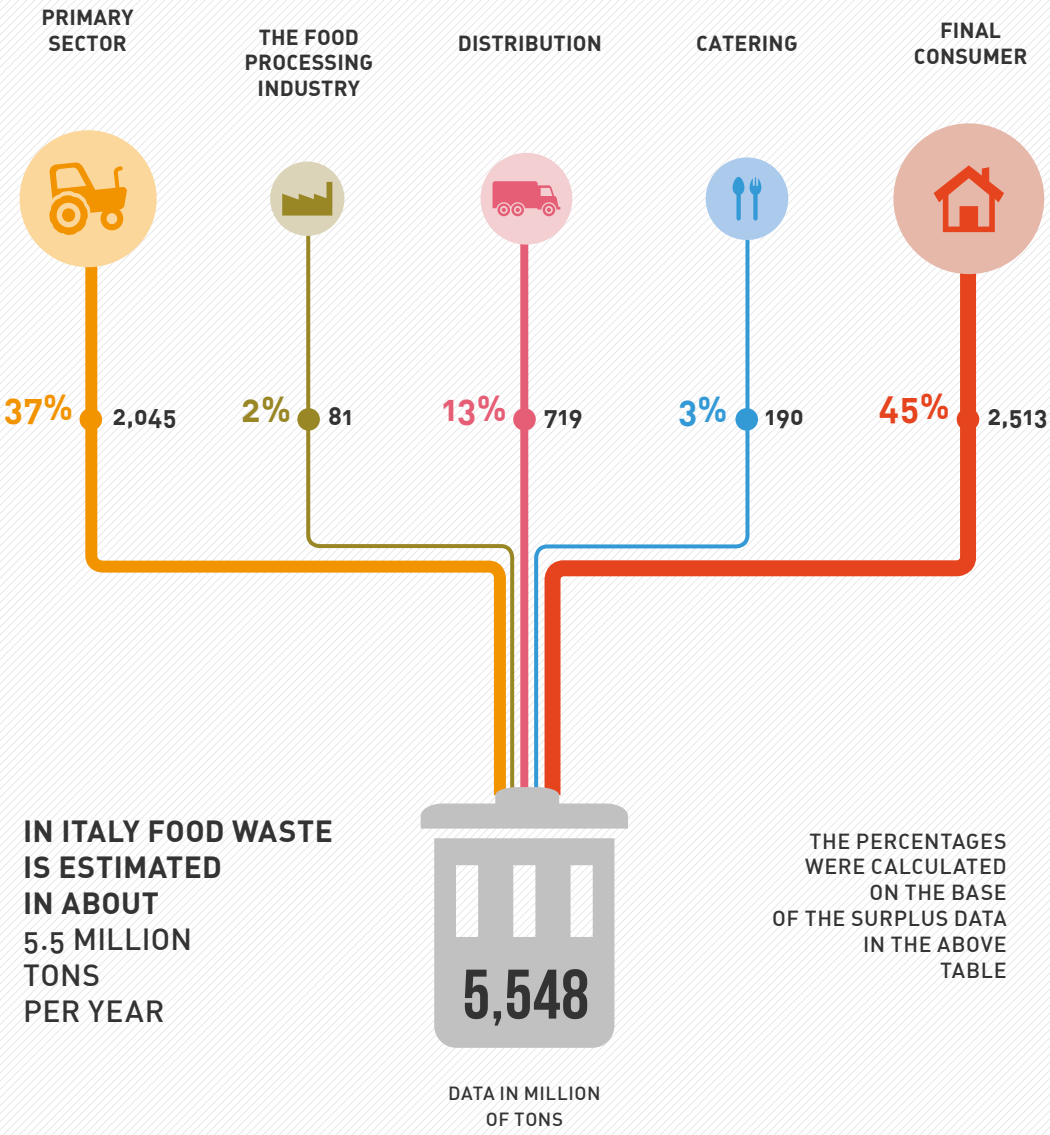
WHO WASTES MORE



IN ITALY FOOD WASTE IS ESTIMATED IN ABOUT 5.5 MILLION TONS PER YEAR

THE PERCENTAGES WERE CALCULATED ON THE BASE OF THE SURPLUS DATA IN THE ABOVE TABLE

Source: processing of data relating to Italy and available in Garrone, 2012

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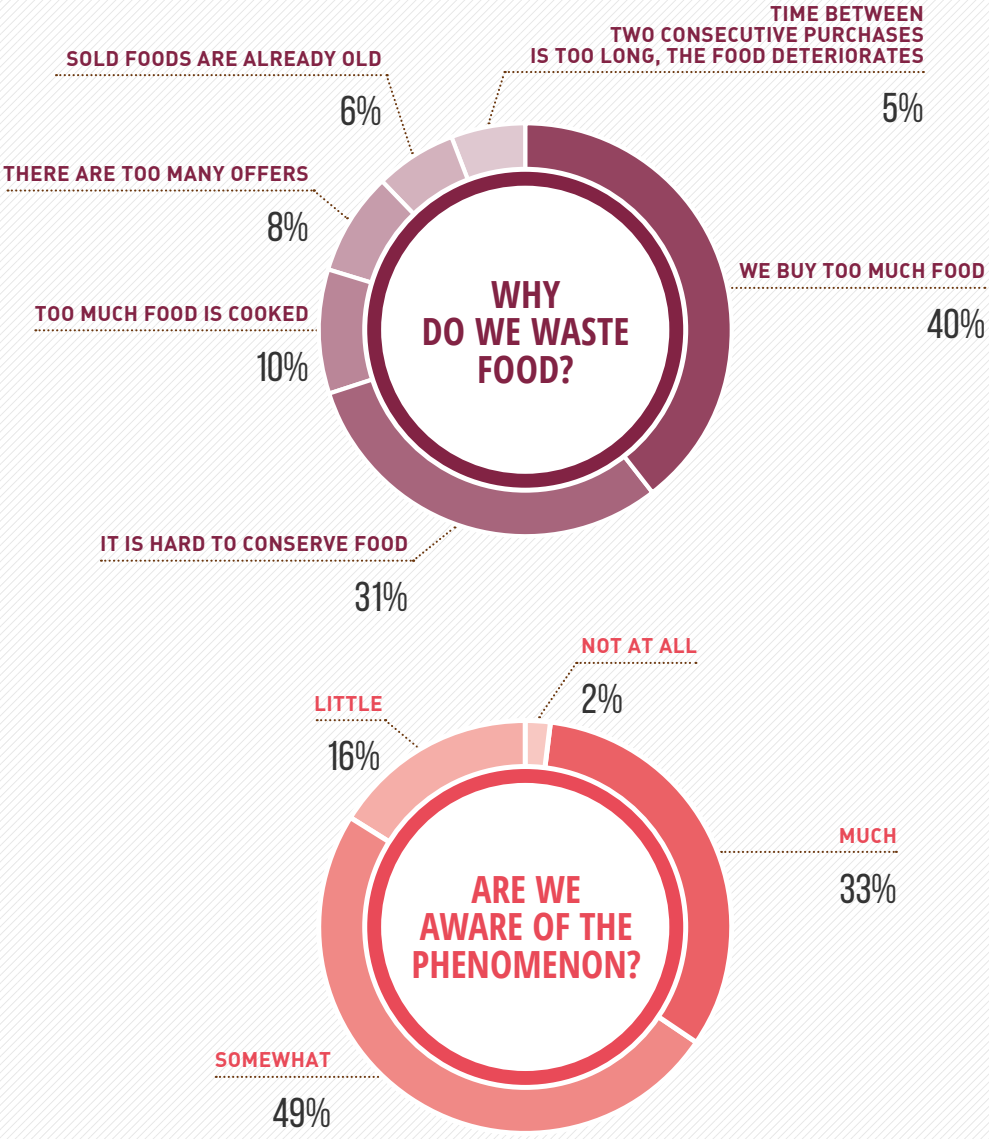
SOME INVESTIGATIONS ON FOOD WASTE



Waste Watcher, since 2013, studies consumer behaviour to investigate the main causes of domestic waste: The main reasons include those relating to the conservation and management of food supplies.
Source: Report Waste Watcher, 2015

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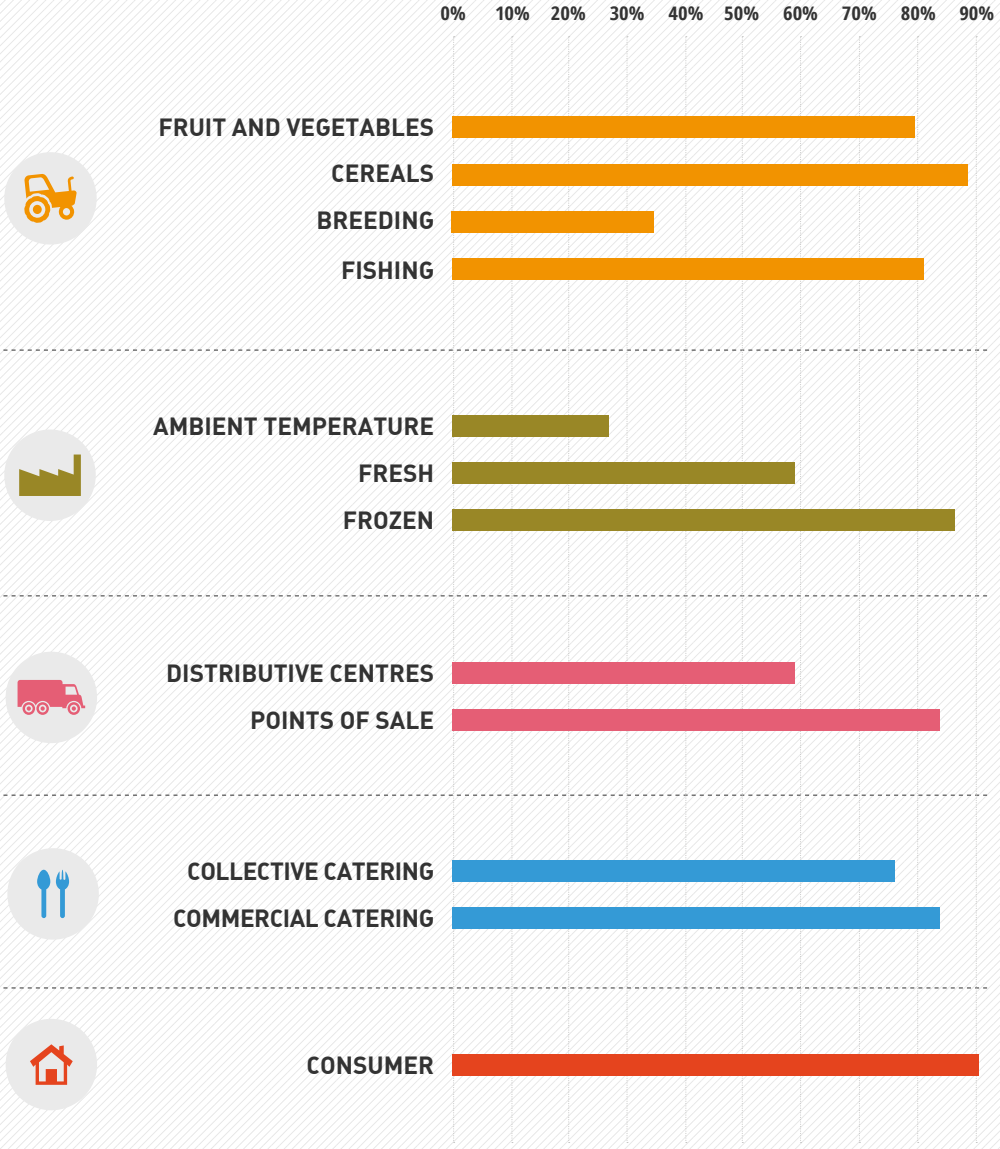
SOCIAL WASTE:
REPRESENTS HOW MUCH SURPLUS FOOD IS WASTED



Among the "less wasteful" categories there are foods derived from breeding as well as those included in the "ambient temperature." category (i.e. less perishable) in the transformation chains (Source: Based on data available in Garrone, 2012

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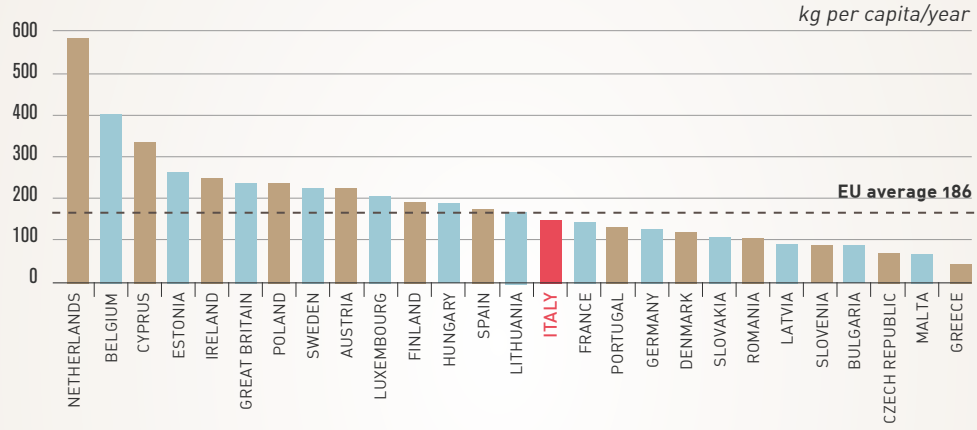
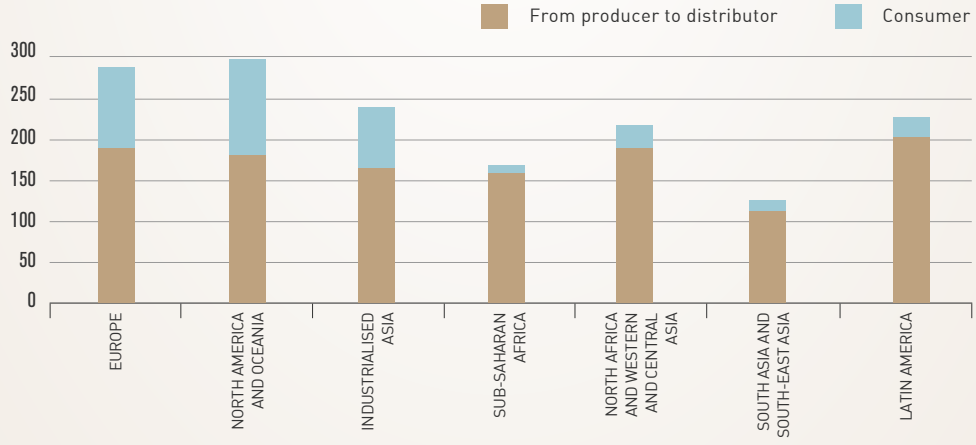
WASTE
IN EUROPE AND IN THE WORLD

The available data relative to the International situation is difficult to analyse because of the lack of homogeneity in the survey methodology. Among the various sources available, the European Commission study should be highlighted, that cites a Community waste average of 180 kg of food per capita per year. The data available worldwide, however, shows the differences between developed and developing countries.



Waste in Europe: The data is not strictly comparable since the survey methodologies may vary depending on the country (Source: Eurostat 2006 from Report: European Commission, 2010. Preparatory study on food waste across EU 27. Technical Report – 2010 – 054.



Waste in the world: In addition to the quantity, the main differences concern the breakdown between the various stages of the chain - Source: FAO, 2011

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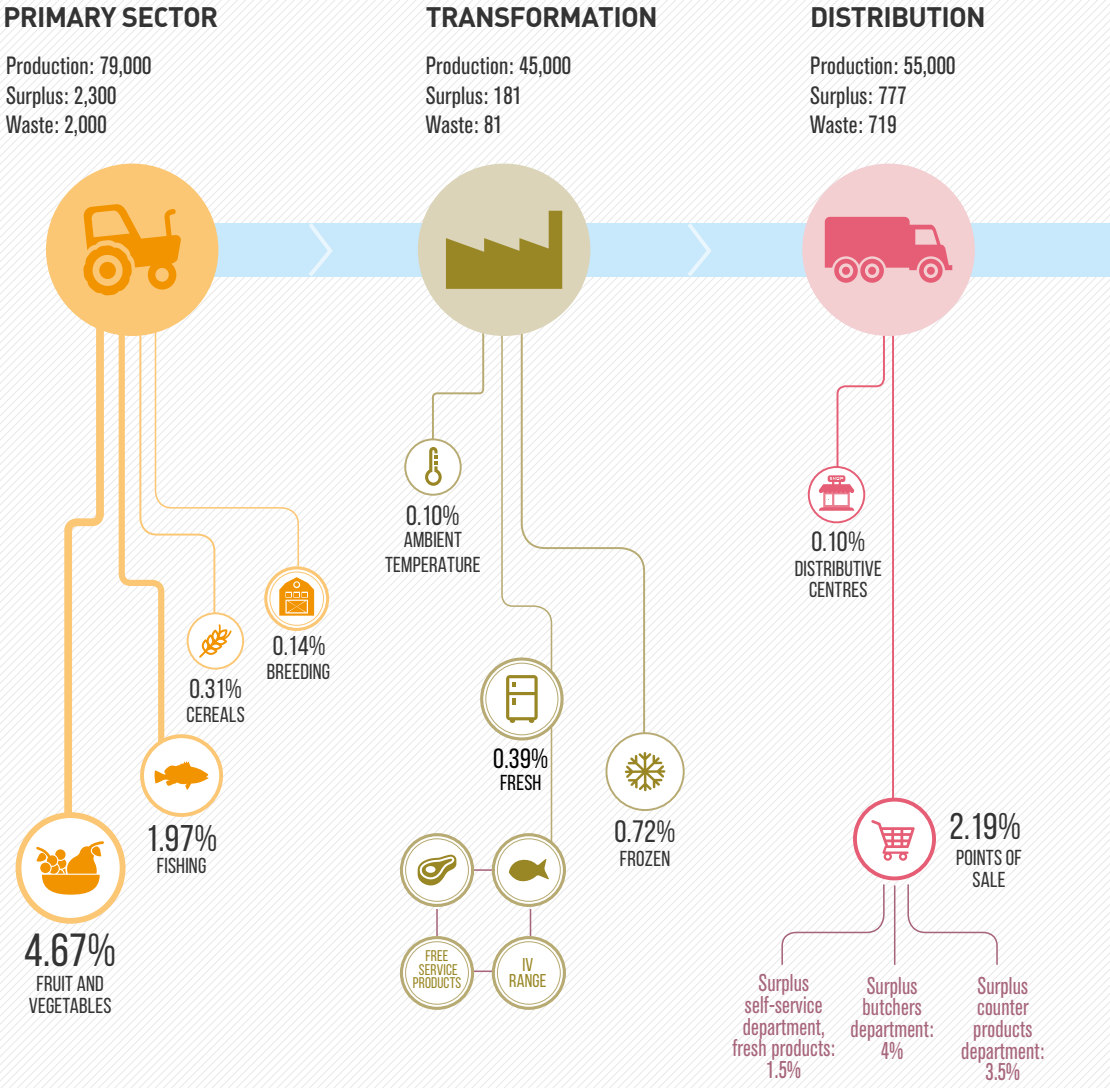
WASTE
IN THE FOOD CHAIN



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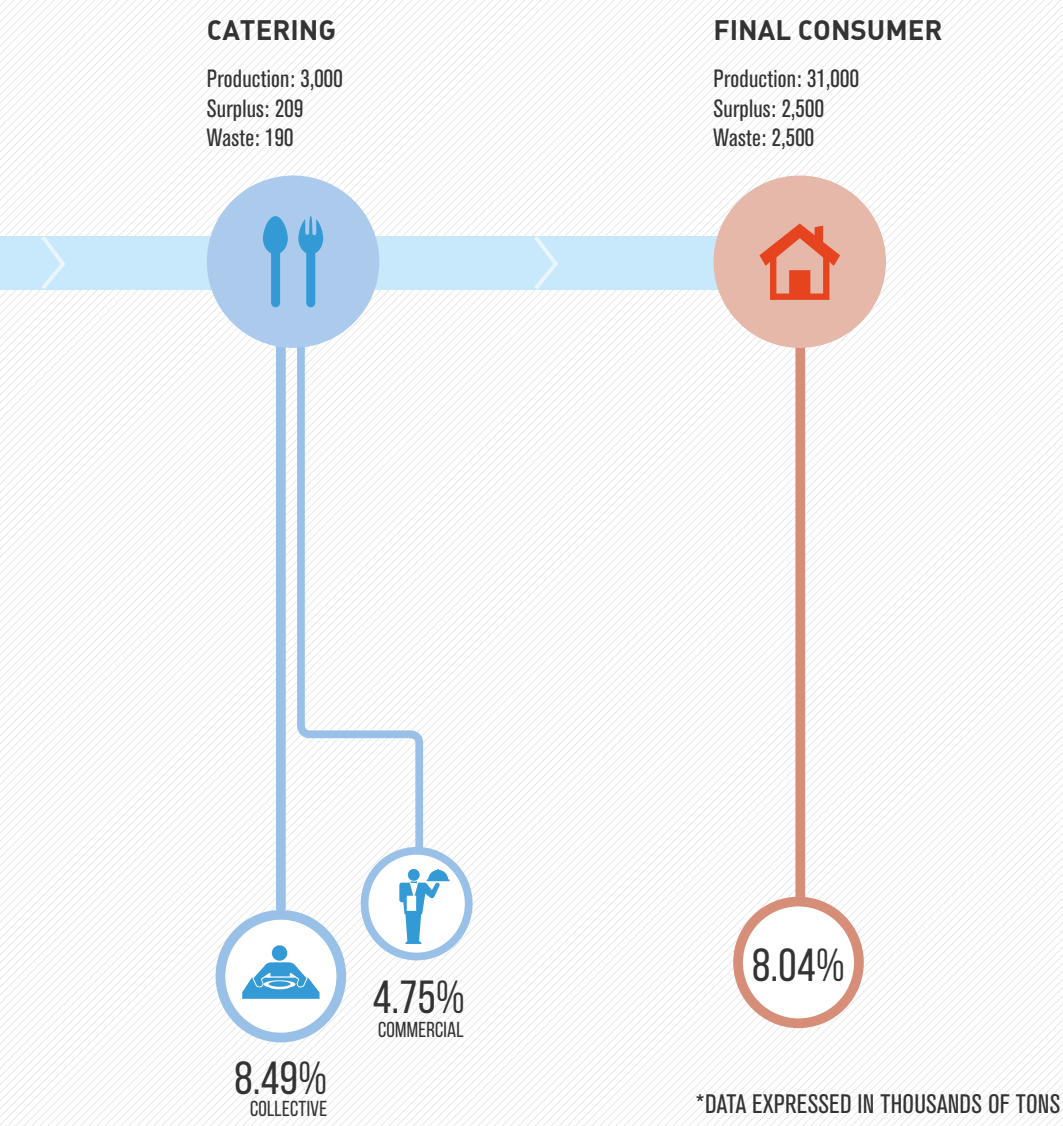
THE PERCENTAGE INDICATES, FOR EVERY STAGE OF THE SUPPLY CHAIN, THE ACTUAL SOCIAL WASTE ON TOTAL PRODUCTION

SURPLUS: edible component of food that is not sold or consumed.
SOCIAL WASTE: part of the surplus that is not used for human nutrition.



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4 WASTE IN THE MEAT CHAIN

Among the available and examined data there is no information that allows a precise and definitive figure on wastage in the meat chain. However, a survey conducted by Nielsen in 2011 on a panel of 9,000 Italian families (available in the text cited by Garrone) estimated the incidence of waste by the consumer for each product sector. Starting from the value of food purchases, the volume of food availability was calculated and to this volume were then applied the waste percentages reported by the families. The overall domestic waste of Italian families is estimated to be 2.6 million tons (about 8% of the total purchased).
In this context, the meat and fish chains are among the most virtuous, with a value equal to 5% of the total waste.
The virtuous result is attributable to different factors during the various stages of the supply chain.

During **breeding and primary transformation**, waste is reduced due to the fact that any overproduction of meat from the slaughtering plants are easily preserved using freezing systems.

In the **distribution** phases, the major cause of waste is the reaching of the expiry date which can be controlled with careful order management towards producers. In this stage one must consider that the highly perishable nature of the product causes waste, because reaching the expiry date or having interruptions in the cooling processes, means that the product no longer meets health and safety standards.

With regards to **domestic consumption**, wastage is reduced because the consumer states that he freezes the food to avoid waste (51%) and stocks less food by shopping frequently without creating too much surplus (49%).

4.1 Meat wastage worldwide

As in Italy, also in the rest of the world the waste of meat is reduced and the differences between the countries are not particularly evident.
However, it is interesting to observe that in industrialised countries the consumer contributes to about 50% of the total waste.
In developing countries losses occur in almost homogeneous amounts throughout the supply chain.

Indeed, in the data on sub-Saharan Africa in the primary sector, losses stand out due to the high animal mortality rate caused by frequent diseases to cattle that are not always properly cured.

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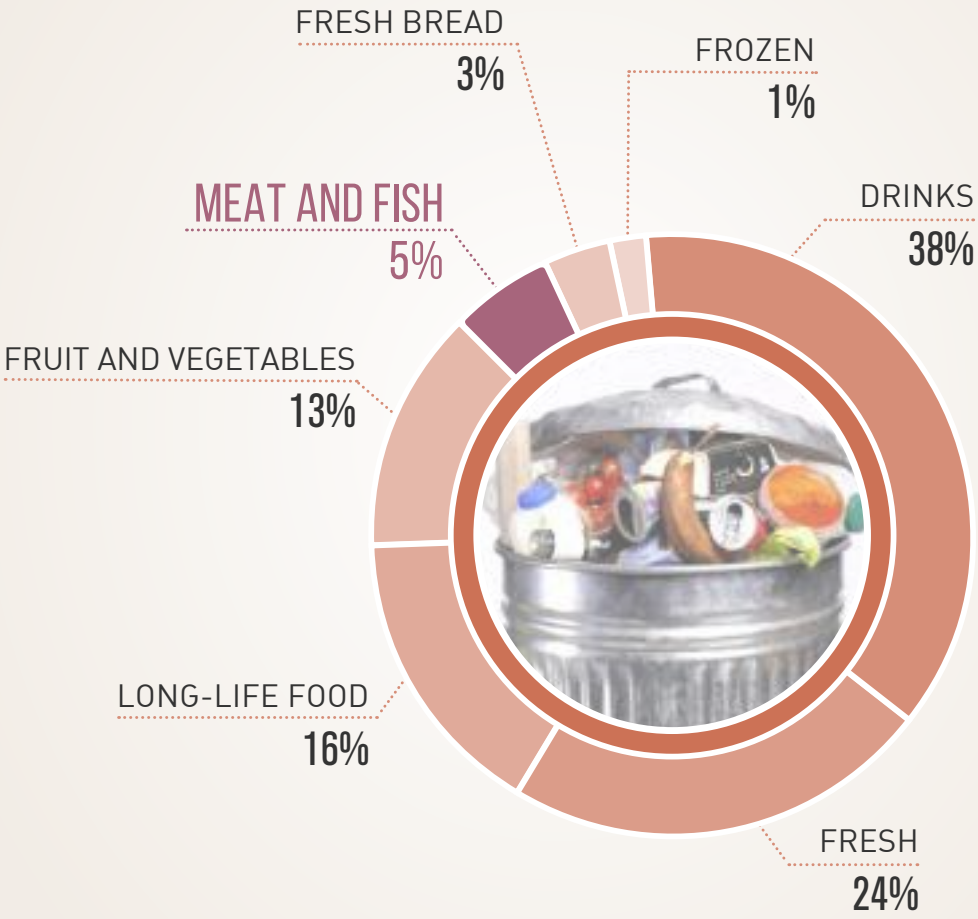
BREAKDOWN BY TYPE OF THE TOTAL WASTE OF ITALIAN FAMILIES



Source: Garrone P. et al., 2012

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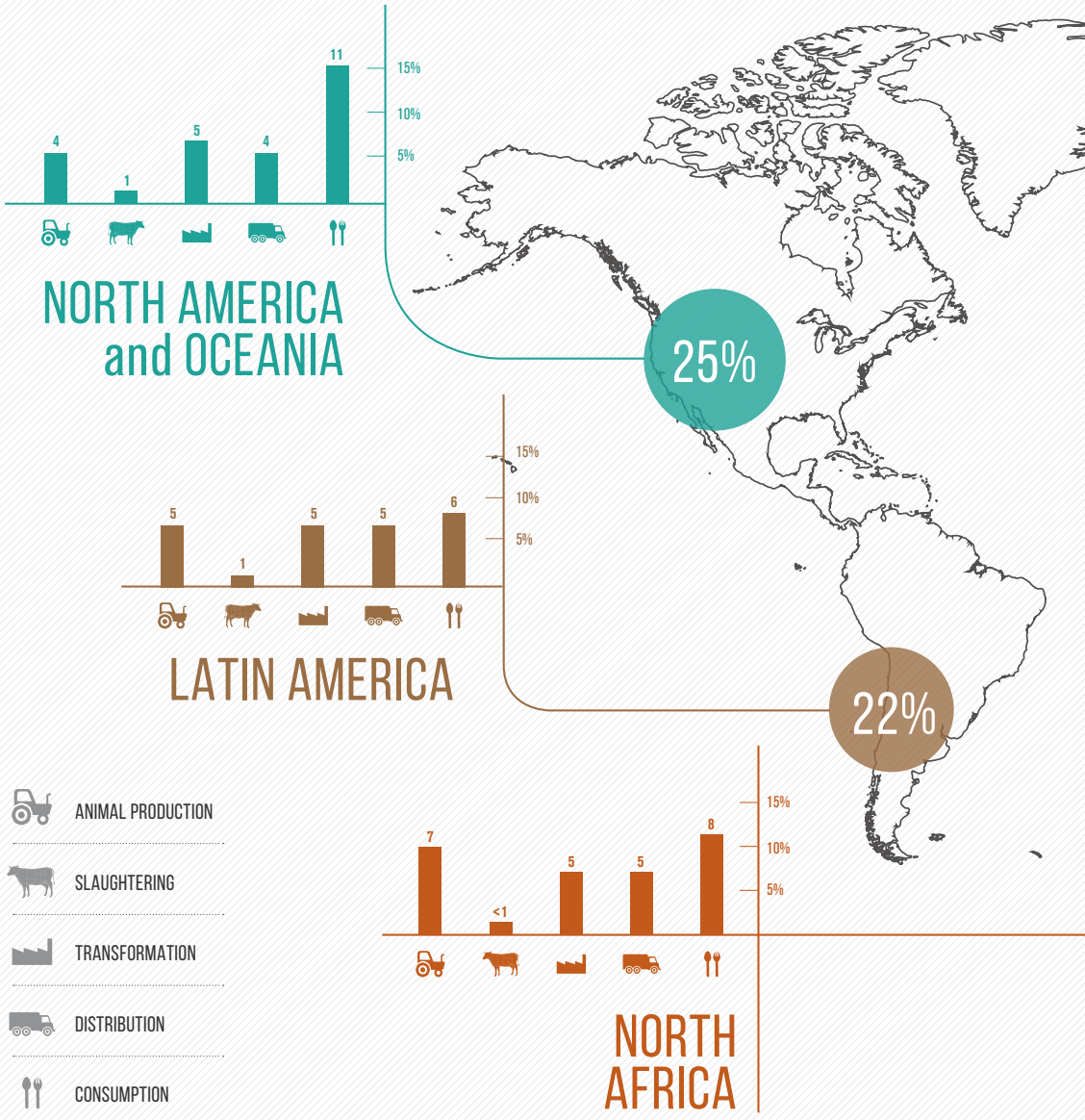
MEAT WASTAGE WORLDWIDE

Source: FAO, 2011

IN INDUSTRIALISED COUNTRIES THE CONSUMER CONTRIBUTES TO ABOUT 50% OF THE TOTAL WASTE



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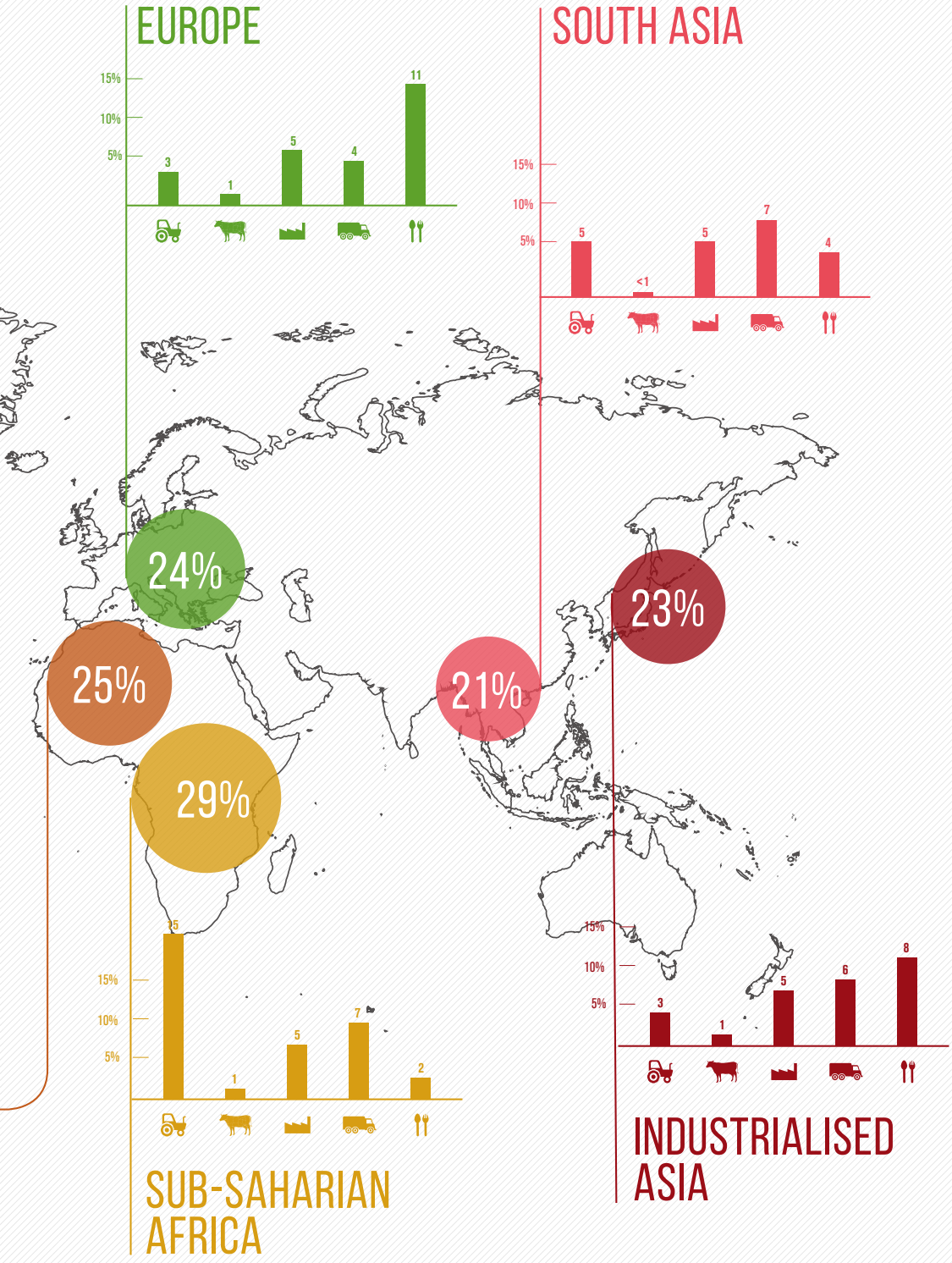

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FREQUENTLY ASKED QUESTIONS

WHAT DO WE MEAN BY FOOD WASTE?

There are many different definitions of waste. The one used in this document identifies social waste as the amount of edible food that is not used by human consumption. Not considered in the figures are therefore all the "necessary" waste such as banana peels, eggshells or the bones of a steak. Under this definition, it is estimated that the amount of food in Italy wasted to be about 5.5 million tons per year, equal to about 3% of the total quantity produced.

IS THERE A LOT OF WASTE IN THE MEAT CHAIN?

All phases of each food chain, unfortunately, generate waste. Meat, also due to the huge amount of destinations that the by-products have and by reusing livestock waste, slurry and slaughter waste for the production of energy, is in this sense among the most virtuous. The production and consumption of meat, in fact, generates a quantity of less than 50% waste compared to fruits and vegetables, and almost equal to half of the waste produced by the cereal sector. Waste that, despite efforts to reduce the environmental impact of this sector, are mainly due to the final consumption stage.

A fact linked probably to the social and cultural value perceived over centuries for these foods.

HOW CAN WE REDUCE THE MEAT WASTE IN THE KITCHEN?

The least wasted food in the kitchen are those of animal origin, and in particular meat. Moreover, they are those with the highest nutritional value, and those who have always been given the most importance, both socially and culturally. Today like yesterday, therefore, finding ways to avoid throwing away meat is an important skill, for mothers and grandmothers as for the most famous starred chefs. The methods to reduce to zero the waste of this noble food are innumerable.

From valorising the scraps from Festivities or from the day before, simply by heating them, by revising them into new and imaginative recipes or through ingenious simple culinary inventions like meatballs and meatloaf, to avoid wasting meat, cured meats and other products (such as milk and eggs) that remain in the refrigerator is very simple. It takes a little imagination and fantasy.

To promote the culture of "recycling" Carni Sostenibili has recently collaborated with two well-known chefs Massimo Bottura and Lisa Casali whose recipes are described on the portal www.carnisostenibili.it/en

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NOTES

[1] Committee on Agriculture and Development Rural - European Parliament, "Avoiding waste of foods: strategies to improve efficiency of the food chain in the EU", 22nd June 2011

[2] Garrone P. et al., 2012

[3] We cite, as an example: Smil, 2004

[4] Segrè A., Falasconi L., 2011

[5] The results of the research were published in the report "The black book of waste in Italy: the food", in which it is estimated that, in Italy, levels of waste at home are 17% of the average purchased fruit and vegetables, 15% of fish, 28% of pasta and bread, 29% of eggs, 30% of meat and 32% of dairy products.

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