



# Survey on food surplus and food waste in Italy: The food processing industry

Paola Garrone, Niso Randellini, Giovanni Scotti, Giulia Valentini  
Milan Polytechnic, Food Sustainability Lab

Research conducted in 2022-'23 by the following working group of the Food Sustainability Lab, Milan Polytechnic.

- Paola Garrone (Scientific Project Manager)
- Marco Melacini (Scientific Director of the Contract Logistics Observatory), Alessandro Perego (Scientific Director of the Digital Innovation Observatories)
- Giulia Bartezzaghi (Director of the Food Sustainability Lab)
- Niso Randellini, Giovanni Scotti, Giulia Valentini (Food Sustainability Lab researchers)

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## Executive summary

The research behind this report was promoted by the non-profit Banco Alimentare Foundation and carried out by the Food Sustainability Lab of Milan Polytechnic. The collaboration also involves the Subsidiarity Foundation, which used the data collected for a complementary statistical survey. This is a multi-year project which aims to raise awareness of the phenomenon of food surplus and waste, focusing particularly on the donation of food products by companies in the food chain to help people in conditions of food and nutrition insecurity.

In the year 2022-'23, research focused on the Italian food processing industry (food and beverages), leaving the study of agriculture and distribution for the following years. The report presents the objectives, methods and results of this first survey. The wealth of data, models and arguments resulting from the research is selectively presented in this executive summary. The results are summarised with the intention of highlighting the main messages that the research sends to the agri-food system and the public. For the sake of brevity, many other important aspects have not been included here. For a complete understanding of all of these issues, please read the full report.

After a broad outline of the methodological basis of the research, the following executive summary presents the report's answers to some "key questions". These issues are relevant for managers of processing companies and non-profit organisations or those responsible for public policies aimed at reducing food waste. For every problem, the behaviour and results of Italian food processing companies are shown, both as a whole and in the groups into which the industry is internally divided: Small, medium or large enterprises; businesses whose products belong to the categories Meat, Fish, Fruit and Vegetables, Oils and Fats, Milk and Dairy, Grains, Pasta and Bakery Products, Other Food Products, Animal Feed or Beverages; businesses located in the regions North West, North East, Central, South or Islands.

For clarification on the meaning of the main terms, please refer to the Glossary included in the report Appendix and the Reference model illustrated in Chapter 3.

## Research methods

In order to gain an in-depth understanding of the dynamics by which surplus is generated and waste is reduced in the sector, it was firstly decided to conduct a qualitative survey using the case study method. The sample consists of 17 companies in the sector, heterogeneous cases to cover the intrinsic variety of businesses in the processing industry. Through interviews with company managers, information was collected on the nature of food surplus, residues and waste, the causes of surplus production, donations and other waste reduction strategies.

The results of the qualitative survey shaped the design of the second part of the research, consisting of a large-scale quantitative survey aimed at obtaining general results valid for the entire sector and its individual components. With regard to this survey, it is worth highlighting two elements that make it possible to accurately represent the behaviour of the Italian food processing industry: the large sample of processing companies consisting of 1812 companies, equal to just over 22% of the 8197 companies in the industry with more than 9 employees; the questionnaire, which is both comprehensible and structured to limit the inevitable approximation and subjectivity of the answers.

## Estimate of donations in the Italian food processing industry: Scope of analysis

The estimates of the number of processing companies that actively donate products in Italy and the size of their donations are presented in Chapter 4 with reference to three different types of companies, as three groups with rather different food surplus management and donation processes were identified in the sample. The most robust estimates are those obtained for major processing companies. In fact, an examination of the sample shows that the process of food surplus management and donation is more structured and formalised in large businesses (73 respondents, 250 or more employees) than it is in medium-sized enterprises (361 respondents, 50-249 employees). This difference between large and small enterprises (1378 respondents, 10-49 employees) is even more stark. The overall awareness of food surplus processes and donation flows is good in large companies (known as the "established network"), as borne out by the fact that many processing companies regularly measure their surplus and donate frequently. A significant proportion of medium-sized enterprises also regularly measure their surplus and donate frequently ("future potential"), while small enterprises are starting to manage surplus and donations in a more organised way ("area to be explored").

Given the structuring of food surplus management processes by large-scale processing companies, the data they have provided appears particularly robust and produces estimates that should be afforded careful attention. Caution should still be exercised when reading the data on donations from small enterprises but, on the whole, small and medium-sized enterprises are a welcome surprise when compared to past surveys that had focused on large enterprises.

Secondly, it should be noted that, with regard to donations, the estimates were based on the biggest product categories. The observations on Animal Feed and Beverages (presented in the analysis of sample data in Chapter 3), products that



are not normally redistributed to deprived persons by the aid system, were not included. The sample used for the estimates therefore refers to the remaining 8 categories of food for human consumption, consisting of 1544 companies. Finally, estimates of the number of donors and donation quantities were obtained using sample weights, as illustrated in the Methodological Appendix.

## Estimate of donations in the Italian food processing industry: Results

The main topic of the research is the donation of surplus food by companies in the Italian processing industry. The sample data is used to obtain estimates of donation indicators for the industry as a whole, i.e. for all processing companies, even those that are not part of the sample. Based on some quantitative “key questions”, the estimates of indicators for the segments that make up the industry are presented (Chapter 4). For the reasons concerning the scope of the analysis, the estimates for large (“established network”), medium-sized (“future potential”) and small enterprises (“area to be explored”) are presented separately.

### *Surplus food donation: Spread of the practice and size of donations*

- *Large businesses:* How wide is the “consolidated network” of donations in Italy, i.e. how many large Italian processing companies frequently or periodically donate their surplus products? How much do the donations of large businesses in the sector amount to? What is the proportion of these donations to their overall production output? The first important figure is the number of large Italian food processing companies that actively donate their surplus. In the Italian processing industry, the vast majority of large companies in the sector donate their surplus on a more or less frequent basis. There are in fact 88 donors, 85% of Italian large processing companies (excluding Animal Feed and Beverages, i.e. in the product categories Meat, Fish, Fruit and Vegetables, Oils and Fats, Milk and Dairy, Grains, Pasta and Bakery Products, Other Food Products). The yearly donations made by large processing companies in one year amount to an estimated 29,200 tonnes of food (again excluding Animal feed and Beverages). As such, every large donor company gives an average of around 332 tonnes of surplus food each year to organisations that use it for social purposes. The estimated donation rate for large donor companies is 0.3% (0.3% of the annual production output of large donor companies only).
- *Medium-sized enterprises:* How many medium-sized processing companies donate their surplus? How much do these donations amount to? What is the proportion of these donations to their overall production output? Medium-sized companies deserve attention given that many of them have structured their surplus management (“future potential”). Approximately 60% of medium-sized processing companies, i.e. 547 medium-sized companies in the Italian food processing industry (excluding Animal Feed and Beverages), are active donors. They donate a total of 109,434 tonnes of food per year. Every medium-sized donor company gives an average of around 200 tonnes of surplus food each year to organisations that use it for social purposes. The estimated donation rate for medium-sized processing companies is 0.8% (of the annual production output of medium-sized donor companies).
- *Small enterprises:* How many small processing companies donate their surplus? How much do their donations amount to? What is the proportion of these donations to their overall production output? We must remember that small enterprises are still emerging in the world of donation. This is an “area to be explored” with close attention; however, due care must be taken when analysing the estimates given the lower robustness - compared to large and medium-sized enterprises - of the data provided. That said, the first key aspect is that slightly more than half of the small enterprises in the food processing industry donate their surplus. This total of 3174 donors amounts to 52% of small processing companies (excluding Animal Feed and Beverages). Secondly, the estimated yearly donations made by small processing companies amount to 138,981 tonnes of food (again excluding Animal Feed and Beverages). Every small donor company gives an average of around 44 tonnes of surplus food each year to organisations that use it for social purposes. The estimated donation rate for small processing companies is 1.2% (of the annual production output of small donor companies).

In order to obtain a preliminary estimate of the total food surplus suitable for human consumption generated by the Italian processing industry and to simulate the food waste prevention target under discussion at the European Commission (see following points), we focused on the quantities of donations made by large and medium-sized enterprises, given the better quality of the data collected for these two categories of businesses.

### *Differences in donations within the sector: In which product categories are there most donors and donations?*

- *Pasta and bakery products:* Processing companies that produce pasta and bakery products are the most virtuous in terms of the prevalence and quantity of donations. 100% of the large companies in the segment donate their surplus (11,490 tonnes). 75% of medium-sized enterprises and 65% of small enterprises are also active donors (49,707 and 73,098 tonnes of products respectively).



- *Fruit and vegetables*: Fruit and vegetable processing companies make up the second largest category of donors, with 100% of large companies, 70% of medium-sized companies and 42% of small companies in the segment active donors (6582, 20,445 and 13,718 tonnes of products donated per year, respectively).
- *Meat, Milk and dairy product* and *Other food product* (chocolate, coffee, snacks, etc.) processing companies are also very active in donating. Among small and medium-sized enterprises, the donation activities of *Grain* producers should also be highlighted.

What differences are there between the different macro-regions of the country?

- Among large businesses, the biggest donors are the processing industry companies in the *North East* (16,783 tonnes a year). For medium-sized enterprises the biggest donations take place in the *North West* (40,909 tonnes a year) while the most generous small business donors are located in the *South* (44,270 tonnes a year).
- Among large and medium-sized enterprises, the practice of donating is most widespread in *Central* and *Southern* Italy, where all or the vast majority of the businesses present donate their surplus. In all areas of the country, around half of small businesses donate, with the highest prevalence observed in the *Islands*.

*Donation partners*: To which non-profit organisations do companies prefer to give their food surplus?

Among the processing companies that responded to this question (addressed only to the 871 donor companies in the sample), Banco Alimentare is the organisation of choice in the majority of cases (248 companies in the sample), followed by Caritas diocesana (215 companies in the sample). As many as 404 companies in the sample donate to a local organisation or association. Some companies indicated more than one donation partner.

*Relationship between donation and other food waste reduction strategies*: Does a greater commitment to donating for social purposes go hand in hand with a greater commitment to other waste reduction solutions?

Donating for social purposes seems to drive “circular” waste prevention strategies, for the most part focused on environmental sustainability, such as the reuse of surplus food for purposes other than donation and the recycling of surplus no longer fit for human consumption, together with other residues and waste.

Among the processing companies who use donation for social purposes, around 75% also adopt one or more practices to reuse surplus food suitable for consumption, such as reprocessing, use on secondary markets, donation to food processing companies or transformation into animal feed. This figure drops to around 52% among those who do not donate.

38% of processing companies that donate their surplus also adopt Recycling and Recovery practices to reuse surplus no longer suitable for human consumption and other residues and waste. Whether on their own or through other companies and partners, surplus donors are involved in activities such as the production of nutrients for agriculture and the production of biogas and other forms of energy. This percentage drops to 30% among processing companies that do not donate.

As such, there is no problem reconciling Circular Economy practices with donation. Rather than being in competition, the two types of strategy appear to be complementary in achieving the shared goal of reducing waste.

## Surplus management processes

Chapter 3 also quantifies the processes and organisational choices to support surplus management and waste reduction that are adopted by the companies in the sample.

### *Measurement process*

To what degree do individual companies monitor and measure food surplus internally? Are there differences within the industry?

The measurement and monitoring of food surplus is a process of strategic value to businesses, a necessary precursor to any activities to prevent food waste. It is therefore surprising to note the overall absence of surplus measurement processes among Italian processing companies. Even when they are present, the process seems to be lacking structure. Although 43% of the companies in the sample measure surplus in some form, only 30% do so on a regular basis. Most of the companies in the sample either did not measure their surplus at all or did not know how to respond or didn't answer.

The measurement process is more structured in larger companies. About three quarters of large processing companies (75%) quantify their surplus. No major differences are observed between companies located in different geographical areas, but product categories seem to have an influence on the decision to monitor and measure surplus. Fish and Pasta and Bakery Product processing companies appear to have a more structured measurement process than the others.

### *Definition of responsibility*



Which company functions are assigned the task of managing surplus?

Responsibility is jointly assigned to several company functions in over half of the processing companies in the sample, while in only 18% of cases is there just a single manager. The main manager is normally an operations manager, i.e. Production in 31% of cases, Quality and Food Safety 14%, Logistics 7% and Supply Chain Management 2%. Assigning surplus management to Sustainability and CSR functions appears to be very uncommon.

## Surplus management and waste reduction case studies

Using 17 case studies, Chapter 2 examined the nature of surplus, the production, causes and strategies for preventing and utilising surplus and reducing waste. The qualitative evidence concerns the following aspects of surplus management and, in particular, donation.

### *Cause of surplus*

What are the differences between surplus and residues and waste? What are the main reasons for the generation of surplus and residues?

Food surplus includes whole products and edible by-products, while residues and waste includes non-edible by-products and degraded or contaminated products and raw materials. The reasons for the generation of surplus and residues are greatly influenced by the product category. For this aspect, we recommend referring to the profiles for each category in Chapter 2.

### *Management strategies*

How do processing companies prevent and take advantage of surplus, residues and waste? How does the behaviour of different product categories and companies of different sizes change?

First of all, the interviewed processing companies prevent the generation of food surplus by adopting several practices: Monitoring of the supply chain; Innovation and optimisation of operations; Improvement of means of transport and infrastructure, collaboration along the supply chain, stock management, supply chain configuration. Secondly, the donation of whole finished products is widespread among the medium-large companies surveyed (less so among small companies), although donation rates are modest. They donate regularly and have stable partnerships with non-profit organisations. Thirdly, a significant part of the surplus, in terms of volume and value, was made up of edible by-products, especially among Meat and Fish processing companies; these are reused by means of reprocessing, transformation and conversion into animal feed. Finally, by-products not suitable for human consumption are used for the production of animal feed or to recover materials and energy; for the time being on a trial basis, processing companies collaborate with companies in other industries for recycling activities (e.g. extraction of compounds for the biomedical and cosmetic industries).

## Food surplus in the Italian processing industry: A preliminary estimate

Based on the estimated donations, is it possible to arrive at a preliminary estimate of the total food surplus suitable for human consumption generated by the Italian processing industry?

Yes, by using the quantitative analysis model on which the report is based. The model presented in Chapter 3 defines the relationships between the main parameters in surplus management and food waste prevention, in accordance with the methodological guidelines of the European Commission ("food waste", European Commission (2021)). Guidance on reporting of data on food waste and food waste prevention according to Commission Implementing Decision (EU 2019/2000)). *Food surplus* suitable for human consumption can be used in two ways: *donation* for social purposes; *other forms of reuse* for human consumption or animal feed (i.e.: Repackaging, Reprocessing into one or more products, Sale in secondary markets such as outlets or less sophisticated foreign markets, Sale via online platforms, Sale to other processing companies e.g. for the production of preserves, Transfer to other processing companies, Small donations or sponsorships, Donations for animal feed, Sale to animal feed producers, Transfer to animal feed producers). The part of the surplus that is not donated or reused for human consumption is called *food waste*. The materials and products that make up this part of the surplus can in any case still be used for environmental purposes, through recycling or energy and material recovery practices, together with non-reused waste and residues, including non-edible by-products separated from food products.

An examination of the reuse rates declared by the companies surveyed and a comparison of these with donation rates shows that the average reuse rate is similar to the average donation rate. On the other hand, the number of donor companies differs from the number that adopt other forms of reuse practices, with the number of companies practising some form of reuse (including purely commercial practices) 31% higher than the number of donors.



Given the lower robustness of the data collected by small businesses, a conservative estimate of *donations for social purposes* managed in a structured manner in Italian industry can be made by summing together the donations made by large and medium-sized businesses (138,634 tonnes a year). On a preliminary basis, and pending further investigation, we can estimate that *other forms of reuse* absorb an amount of surplus equal to 131% of donations (181,927 tonnes per year). By summing an estimate of *food waste* with the amount of *surplus used for human consumption*, we should be able to establish the total amount of surplus generated by the Italian processing industry, whether used for food or not. For the time being, the research underlying the report has not produced an estimate of this variable; moreover, it would not be correct to include an estimate of the food waste produced by the European Commission (next point), which is obtained with different data and methods.

However, according to a preliminary estimate, the total amount of *surplus used for human food* (for the moment excluding reuse for animal feed) in the Italian processing industry, including *donations* and *other forms of reuse*, comes to 320,561 tonnes per year, i.e. 1.0% of the output of active donor processing companies in the 8 product categories on which the quantitative estimates are based (or 0.6% of the total output of the industry, donors and non-donors). It is to such practices that those asking how to further reduce food waste must look.

## Food waste prevention: Towards 2030

What challenges await Italian processing companies and their stakeholders, including organisations involved in the recovery of surplus food, in the coming years?

By way of example, one can consider the Food Waste reduction target for 2030 that is being discussed as part of a proposed revision of the Waste Framework Directive by the European Commission. To date, it is unclear what the outcome of this proposal will be, but it does make it possible to consider the possible pathways of development open to the industry. This target would involve reducing food waste by 10% in 2030 compared to the levels observed in 2020. If one were to take as a reference the estimate of food waste published by the European Commission in 2022 for Italy (as for the other Member States) and for processing and manufacturing (as for the other stages of the supply chain), equal to 510,018 tonnes per year, the reduction in food waste required in the Italian processing industry on this hypothetical pathway would equate to 51,002 tonnes per year. Consideration of this data (an aggregate estimate, without the structure of the results presented so far) leads to two reflections.

Firstly, the donations and other forms of surplus food reuse implemented by Italian processing companies are already playing an important role in preventing waste. In fact, if the surplus food fit for human consumption, which we estimate amounts 320,561 tonnes per year in large and medium-sized Italian processing companies, was not used, the level of food waste in the sector would be up to 63% higher.

Secondly, as part of a hypothetical commitment to additional food waste prevention, our target for 2030 is a further 10% reduction in food waste (51,002 tonnes) and this depends on our ability to make use of surplus food fit for human consumption, either through donation or other forms of reuse. As the example simulation shows, Italian processing companies would have to valorise an additional 16% of surplus food fit for human consumption, thereby preventing this quantity from becoming residue and waste unfit for human consumption (and as such sent for recycling or energy recovery or, in the worst case scenario for the environment, waste for disposal). According to an “extensive” model of waste prevention, for the Italian processing industry this would mean increasing the number of companies engaged in donation and increasing the number of companies that implement reuse practices.

## Conclusions

The main findings of the report can be summarised in a few key messages and open questions, which can be found in the following slides:

- Food processing: a multi-speed sector
- Donation: a growing practice
- Donation: quantities in Italy
- Donation: results by product category and geographical area
- Waste prevention: convergence between donation and the circular economy
- Surplus food recovered for human consumption: a preliminary estimate
- Open questions:
  - o Further actions to prevent food waste?
  - o Actions to strengthen donation processes in small businesses?
  - o Parts of Law 166/2016 still to be applied?





**Research objectives** Non circolare

- Multi-year research project promoted by **Banco Alimentare Foundation NPO** and entrusted to **Milan Polytechnic** (Food Sustainability Lab) and **Subsidiarity Foundation**
  - 2022-2023:** Italian **food processing** industry
  - 2023-2024:** **Agricultural production** and animal husbandry sector
  - 2024-2025:** Food **distribution**
- Develop an understanding of **surplus** and **food waste**, with particular focus on **donation** for social purposes

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ES Slide 1: Research objectives

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**Study parameters** Non circolare

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graph TD
    Production[Production] --> ProductionSold[Production sold]
    Production --> SurplusFood[Surplus food]
    SurplusFood --> Donation[Donation]
    SurplusFood --> OtherReuse[Other forms of reuse]
    OtherReuse --> SurplusRecovered[Surplus food recovered]
    SurplusFood --> Recycling[Recycling and recovery]
    Recycling --> UnrecoveredWaste[Unrecovered waste]
    InedibleByProducts[Inedible by-products] --> FoodWaste[Food waste]
    UnrecoveredWaste --> FoodWaste
  
```

- Surplus food:** Unsold production
- Donation** and **Other forms of reuse:** Surplus recovered for human consumption
- Food waste:** Surplus not used for human consumption; used in part however through **Recycling and recovery** (together with inedible by-products)

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ES Slide 2: Study parameters

Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**Key messages** Non circolare

- Surplus management and donations: a multi-speed sector
- Donation: A growing practice
- Donation: Quantities in Italy
- Donation: Results by product category and geographical area
- Waste prevention: Convergence between Donation and the Circular Economy
- Surplus food recovered for human consumption: A preliminary estimate
- Open questions. In the Italian food processing industry:
  - Further actions to prevent food waste?
  - Actions to strengthen donation processes in small businesses?
  - Parts of Law 166/2016 that can be applied?

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ES Slide 3: Key messages

Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))



**Surplus management: Enabling processes** Non circolare

Processes that aid donation and other waste reduction practices

- Regular **measurement** and monitoring of surplus
- Identification of a food surplus **manager**
- Lasting donation **experience**
- **Frequency** of donations

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ES Slide 4: Surplus management process

Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**(1) Surplus management and donations: a multi-speed sector** Non circolare

Food processing: Three very different groups of businesses in terms of the structure of processes and data quality.

Large enterprises <i>(Consolidated network)</i>	Medium-sized enterprises <i>(Dynamic cluster)</i>	Small enterprises <i>(Great potential)</i>
<ul style="list-style-type: none"> <li>• (250+ employees):</li> <li>• Many regularly measure surplus (64%);</li> <li>• Many make frequent donations (49%).                             <ul style="list-style-type: none"> <li>• <b>A structured and formalised network with robust data.</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• (50-249 employees):</li> <li>• A part regularly measure surplus (39%);</li> <li>• Some make frequent donations (24%).                             <ul style="list-style-type: none"> <li>• <b>Surplus management processes being strengthened.</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• (10-49 employees):</li> <li>• A few regularly measure surplus (26%);</li> <li>• Few make frequent donations (15%).                             <ul style="list-style-type: none"> <li>• <b>Organisations of great interest, with data still unclear.</b></li> </ul> </li> </ul>

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ES Slide 5: Processing, a multi-speed sector

Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**(2) Donation: A growing practice** Non circolare

Food processing (excluding Beverages and Animal Feed)		Number (percentage) of donors
<b>Large enterprises (250+ employees)</b>	Consolidated network	88 (85% of Large enterprises)
<b>Medium enterprises (50-249 employees)</b>	Dynamic cluster	547 (60% of Medium enterprises)
<b>Small enterprises (10-49 employees)</b>	Great potential	3147 (52% of Small enterprises)

85%  
60%  
52%

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ES Slide 6: Donation, a growing practice

Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))





**Prospects of three groups of processing companies** Non circolare

- **Large** processing companies: well-established in surplus management and donations thanks to structured and formalised processes
- **Medium-sized** processing companies: potential to continue structuring and formalising processes
- **Small** processing companies: a large and diverse world; the processes required for regular and frequent donation practices need to be understood.

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ES Slide 7: Prospects of three groups of processing companies  
 Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**(3) Donation: Quantities in Italy** Non circolare

Food processing (excluding Beverages and Animal Feed)		Number of donors	Quantity of donations	Average donation	Donation rate	Quantity of donations (Large and Medium enterprises): approx. 139,000 tonnes a year
Large enterprises (250+ employees)	Consolidated network	85% of Large enterprises	29,200 tonnes a year	332 tonnes per company	0.3% of production	
Medium enterprises (50-249 employees)	Dynamic cluster	60% of Medium-sized enterprises	109,434 tonnes a year	200 tonnes per company	0.8% of production	
Small enterprises (10-49 employees)	Great potential	52% of Small enterprises	139,981 tonnes a year	44 tonnes per company	1.2% of production	

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ES Slide 8: Quantities in Italy  
 Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**(4) Donation: Results by product category and geographical area** Non circolare

- **Product categories**
  - ☐ **Pasta and bakery products** lead the way;
  - ☐ Followed by **Fruit and vegetables**;
  - ☐ **Meat**, Milk and dairy products and Other food products (coffee, snacks, etc.) also to the fore.
- **Geographical areas - quantity of donations.** Leading the way:
  - ☐ among **Large** enterprises the **North East**;
  - ☐ among **Medium-sized** enterprises the **North West**;
  - ☐ among **Small** enterprises the **South**.
- **Geographical areas - prevalence of donors** Leading the way:
  - ☐ among **Large** and **Medium-sized** enterprises **Central** and **Southern** Italy;
  - ☐ among **Small** enterprises the **Islands**.

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ES Slide 9: Donation: Results by product category and geographical area  
 Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))



**(5) Waste prevention: Convergence between Donation and the Circular Economy** Non circolare

- Virtuous circle between **donation** for social purposes and **Circular Economy** strategies in the Italian processing industry.

The diagram illustrates a virtuous circle between Donors and Non-donors. Donors are shown with 75% donation and 38% recycling and recovery. Non-donors are shown with 52% other forms of reuse and 30% recycling and recovery. Arrows indicate the flow of 'Other forms of reuse' and 'Recycling and recovery' between the two groups.

- Donation, Reuse, Recycling and Recovery are **complementary** activities in the pursuit of the shared goal of **preventing waste**.

POLITECNICO MILANO (DIEM) Indagine sulle eccedenze e sullo spreco alimentare in Italia Banco Alimentare

ES Slide 10: Waste prevention: Convergence between Donation, Reuse, Recycling and Recovery  
Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**(6) Surplus food recovered for human consumption: A preliminary estimate** Non circolare

The flowchart shows the flow of surplus food. Production is split into Production sold and Surplus food. Surplus food is split into Donation and Other forms of reuse (Surplus food recovered) and Recycling and recovery (Unrecovered waste). Inedible by-products are also shown.

**Surplus used for transformation** (Large and Medium-sized enterprises):  
**321,000 tonnes a year = 139,000 (Donated) + 182,000 (Other forms of reuse)**

POLITECNICO MILANO (DIEM) Indagine sulle eccedenze e sullo spreco alimentare in Italia Banco Alimentare

ES Slide 11: Surplus food recovered for human consumption: A preliminary estimate  
Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**7) Open questions / 1: Further actions** Non circolare

- If the surplus food fit for human consumption was not recovered through **donations** and **other forms of reuse**, the level of **food waste** in the sector would be **much higher**.
  - The approximately 510,000 tonnes of food waste estimated by the European Commission would be joined - in the absence of donation and other forms of reuse - by 321,000 tonnes of unused surplus (an increase of **63%**).
- Questions**
  - Can the sector maintain or strengthen its commitment?
  - What further actions could be taken between now and 2030? As an example, consider the food waste reduction target for 2030 under discussion at the European Commission (51,000 tonnes). Are pathways such as the ones below conceivable?
    - Extensive model*: Increase in the number of **donors** (and the number of companies practising other forms of Reuse)?
    - Alternatively, Intensive model*: Increase of around **22,000 tonnes in donations** (and about 29,000 tonnes in other forms of Reuse)?
    - Hybrid paths between intensive and extensive?

POLITECNICO MILANO (DIEM) Indagine sulle eccedenze e sullo spreco alimentare in Italia Banco Alimentare

ES Slide 12: Open questions / 1: Further actions to prevent food waste in the Italian processing industry?  
Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))



**(7) Open questions / 2: Small food processing businesses** Non circolare

- **Small and medium-sized enterprises** are a **positive surprise** in this research in terms of the prevalence of donors and the quantity of donations.
  - **Small enterprises** are a very promising but little known **area to be explored**, and must strengthen their in-house surplus management skills.
- **Questions**
  - What **actions** can **Small enterprises**, their **associations** and **policymakers** (e.g. Regions, Ministries, European Commission) take?
    - Collaboration, Joint donations...?
    - Training, Incentives and awards for good practices...?
    - ...?
  - What **innovations** and **collaboration initiatives** can **organisations** involved in the **recovery** of surplus food (including Banco Alimentare) implement to meet the needs of small businesses?

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ES Slide 13: Open questions / 2: Actions to strengthen donation processes in small food processing businesses in Italy?  
 Source Digital Innovation Observatories - Milan Polytechnic ([www.osservatori.net](http://www.osservatori.net))

**(7) Open questions / 3: Law 166/2016: New outlooks** Non circolare

- The recent adoption of surplus food donation practices in many businesses can be linked to the many dissemination, regulation and support actions undertaken in Italy and Europe over the last 10 years.
- **Questions**
  - The so-called "**Gadda Law**" of 2016 also played an important role, but was it fully **implemented**?
    - In fact, relatively few municipalities grant donors a reduction in their waste management taxes. How can this good practice be spread among local authorities?
    - In practice, the transformation of surplus food for social purposes by non-profit organisations still faces regulatory barriers. What rules can expand the number of permissible waste prevention practices?
    - What is the role of the Inter-Ministerial and Inter-Sectoral Coordination Table established at the former Ministry of Agricultural, Food, and Forestry Policies in 2012 and confirmed by the Gadda Law (functions attached)?
    - ...?

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ES Slide 14: Open questions / 3: Parts of Law 166/2016 still to be applied?  
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**Conclusions and areas of discussion** Non circolare

- **Good practices** to reuse surplus and prevent waste: Measurement, Organisation of processes, Frequent donations
- **Donations in Italy** by Medium-sized and Large enterprises: Large quantity, amounting to approximately 139,000 tonnes a year
- **Medium-sized enterprises**: Very interesting area for structuring and formalising surplus management and donation processes
- **Surplus recovered in Italy** by Medium-sized and Large enterprises (Donations, Other reuse): Approx. 321,000 tonnes a year
- **Synergies** between donation and Circular Economy practices
- **Open questions**
  - Further actions
  - Small enterprises
  - Framework of rules and incentives

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ES Slide 15: Conclusions  
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