

Central de Abasto – Mexico City (CEDA)

Understanding food loss and waste at the world's largest market

Food Loss and Waste Measurement, Prevention and Reduction Case Study

Organization

The Central de Abasto, located in the Iztapalapa borough of Mexico City, is the world's largest wholesale market, covering 3.27 km² of land area, making it larger than the country of Monaco, and handling over 30,000 tonnes of merchandise each day. The market houses more than 2,000 businesses, employing more than 70,000 people and serving more than 300,000 customers daily. Thirty-five percent of all food consumed in Mexico is sold through the Central de Abasto.

Products sold at the market include flowers and horticulture supplies, dry goods, fruits and vegetables, and meat and poultry.

What was measured?

The Central de Abasto, the world's largest wholesale market, measured food loss and waste and assessed attitudes relating to that waste among its fruits and vegetables vendors.

How was it measured?

The operators of the market conducted a survey of fruits and vegetables vendors, asking them both quantitative and qualitative questions about their own food loss and waste.

What were the results?

The 158 survey respondents provided valuable insights about the quantity and causes of food loss and waste at the market, which will help the Central shape future efforts to prevent and reduce food loss and waste.



Figure 1. An aerial view of the Central de Abasto, covering 3.27 km². Source: Central de Abasto of Mexico City.

Introduction

Because of the crucial role the Central de Abasto plays in the Mexican food distribution system, its operators are very aware of the importance of addressing food loss and waste (FLW) occurring at the market. The market already has a donation program in place to redirect unsold food to those in need, and collected and donated more than 318,000 kg of unsold food between March 2020 and March 2021. Despite this effort, large amounts of food at the market were still being lost or wasted and subsequently disposed of in compost or landfill.

Considering the social, environmental and financial implications of the FLW being generated at the market, the operators of the Central de Abasto took part in the Commission for Environmental Cooperation (CEC) project on *Preventing and reducing food loss and waste*, serving as one of the case studies (the present one) in which the CEC's [Practical Guide](#)¹ to FLW measurement was tested. To better understand the causes and extent of FLW within the market, as well as the attitudes and awareness toward FLW among vendors within the market, the Central engaged in a survey of its fruits and vegetable sellers.

Methodology

Survey

Based on waste management data collected in 2020, 45.7% of the organic waste generated at the market comes from fruit and vegetable sellers. This amounts to 32,725 tonnes of waste annually. Because of this high proportion of the

market's total loss and waste, the operators of Central de Abasto conducted a survey of its fruits and vegetables vendors to better understand the issue. The survey was designed by the operators of the market in conjunction with a project team from the CEC. The survey was based on the principles for survey design provided in the CEC Practical Guide, [Why and How to Measure Food Loss and Waste](#), and the associated [appendix](#), providing detailed instructions on a variety of food loss and waste measurement methods.

The survey asked the respondents to assess the amounts and causes of food loss and waste occurring within the market, as well as the attitudes of the vendors regarding it. Respondents were asked to answer the following questions:

1. How much food do you sell (in kg), and how much of it is lost or wasted?
2. What are the causes of this loss and waste for your products?
3. What have you already done to reduce that loss or waste?
4. When the loss or waste you generate is disposed of, do you know its destination?
5. Why is food loss and waste a concern for you and your business?
6. What obstacles do you face in trying to reduce food loss and waste?
7. What would you be willing to do to prevent food loss or waste?

Ultimately, 158 vendors, selling 34 different types of fruits and vegetables, completed the survey, providing valuable input regarding food loss and waste occurring at the market.

Product	Loss	Product	Loss
Cucumber	28.57	Avocados	3.82
Mamey fruit	23.08	Pineapple	3.61
Watermelons	16.10	Citrus	2.23
Eggplant	13.04	Tomatoes	1.91
Mushrooms	12.00	Plantains	1.74
Broccoli	10.65	Chile Peppers	1.64
Chard	6.78	Other Fruits	1.32
Papaya	6.19	Jicama	0.25
Asparagus	6.00	Potato	0.16
Pear	5.88	Corn	0.12
Cabbage	5.47	Other Melons	0.07
Apples	5.39	Lettuce	0.00
Blackberries	5.21	Seeds	0.00
Mango	4.97	Guava	0.00
Onion	4.76	Cocoa	0.00
Garlic	4.26	Prickly pear	0.00
Carrots	4.01	Grapes	0.00

¹ Title: "Why and How to Measure Food Loss and Waste: A Practical Guide".

Results

The results of the survey are summarized here:

Q1: How much food do you sell (in kg), and how much of it is lost or wasted?

Of the 34 types of foods being sold, vendors reported anywhere from 0%-28.57% losses annually (Table 1). Some common trends can be observed from these results:

- Foods with higher water content (such as cucumber, mamey fruit, watermelons and eggplant) tend to have a higher rate of loss. This is due to these foods being more perishable and thus more likely to be lost or wasted if not sold quickly. This finding suggests that these product types are most in need of some sort of intervention to reduce further wastage.
- Loss rates for other vegetables (such as broccoli, chard, asparagus, and cabbage) tend not to be as high as for fruits, although still sufficiently significant to warrant further action.
- Other foods that last longer without spoilage (such as chile peppers, jicama, potatoes, corn, and seeds) have much lower loss rates, and therefore are less likely to need intervention to prevent wastage.

Q2: What are the causes of this loss and waste for your products?

Sellers provided five common causes, of roughly equal frequency, for the occurrence of food loss and waste in their operations. These were:

- Product not purchased by consumers
- Decomposition or spoilage of the product
- Cosmetic damage to the product (but still edible)
- Difficulty bringing the product to market
- Difficulty with storage, leading to damage or spoilage

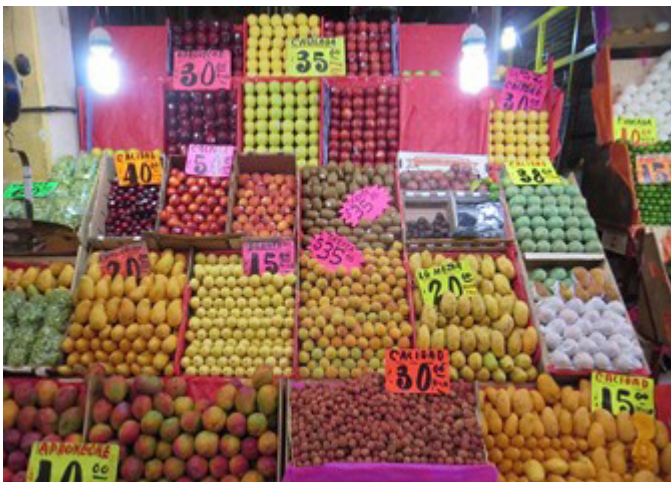


Figure 2. One of the many fruit and vegetable sellers within the Central de Abasto. Source: Hernán García Crespo, Flickr, [Central de Abasto](#), Creative Commons 2.0.



Figure 3. Customers shop at the market. Source: Hernán García Crespo, Flickr, [Central de Abasto](#), Creative Commons 2.0.

These causes were reported at roughly equal frequency and without any specific trends for the various product types. (For example, fruit sellers were not more likely to report decomposition/spoilage as a cause of losses than sellers of other goods.)

Q3: What have you already done to reduce that loss or waste?

More than half of the businesses surveyed reported not having taken any concrete previous action to reduce food loss and waste within their business. The most common response, aside from not having done anything, was that sellers would bring less produce to the marketplace, while others reported lowering prices, improving product storage and handling, and donating excess products. However, none of these actions were especially prevalent, with each being reported by fewer than 10 respondents.

Q4: When the loss or waste you generate is disposed of, do you know its destination?

As discussed in the CEC Practical Guide, food can go to several different destinations when being disposed of, such as animal feed, composting, incineration, sewage, or landfill. These destinations are each associated with different impacts—for example, landfill is generally the least desirable destination for food loss and waste disposal, due to the methane generated in them.

Of the respondents completing the survey, just 26% knew the disposal destination of their food loss and waste. The remaining 74% indicated no knowledge of disposal practice.

“The Central de Abasto of Mexico City is committed to implementing a model of circular economy in order to minimize the generation of organic and polluting waste. Thus all persons and shops that participate in the Central have undertaken the purpose and task of reducing daily food loss and waste.”

- Marcela Villegas Silva, general coordinator for the Central de Abasto of Mexico City

Q5: Why is food loss and waste a concern for you and your business?

For responding sellers, the monetary costs and lost profits associated with food loss and waste were the primary concern reported. About 25% of respondents also indicated that morally it seemed wrong for food to go to waste, while a smaller group (roughly 10%) expressed concern about the environmental costs associated with the production and distribution of food that goes to waste.

Q6: What obstacles do you face in trying to reduce food loss and waste?

The respondents identified three primary obstacles for reducing food loss and waste. The first was difficulty relating to loading and unloading of goods, resulting in damage and destruction of products. The second was limited storage capabilities, which prevent producers from storing their produce for longer periods if they cannot be sold immediately. Finally, a lack of access to sufficient refrigeration was also cited as a concern, since many foods need to remain cool during transportation and display or will otherwise spoil.

Q7: What would you be willing to do to prevent food loss or waste?

Respondents were presented with four choices for what they would be most willing to do to prevent food loss and waste in the future. Their responses are summarized in Table 2.

As with earlier questions, this response suggests that sellers would most desire to recover some economic value from food that would otherwise go to waste, although 39% of respondents would prefer to either donate produce to food banks or give it away to their customers. Inventory tracking would also be a useful step, as it would allow the market to gain additional data on food loss and waste and tailor their actions accordingly.

Conclusions

The responses to this survey reveal a number of valuable insights:

Food loss and waste is more prevalent for some types of foods than others. In a market setting like the Central de Abasto, certain foods will spoil more quickly. Therefore, the greatest immediate impact will be achieved by targeting the loss and waste of the most perishable products.

Storage and access to refrigeration are two areas where improvements could greatly benefit both sellers and customers at the Central de Abasto, as these areas, together with handling, are the most frequent causes of perishability. Some possible improvements would be to provide training to sellers about proper handling techniques, as well as installing centralized cooling/refrigeration that sellers can use or rent to help preserve their products.

Action	% of Survey Respondents Who Prioritize This Action
Reduce prices for consumers	36%
Donate food to food banks	27%
Track food in an inventory to help measure food loss and waste	25%
Give away food to customers	12%

The economic argument is strongest for encouraging businesses to reduce food loss and waste.

All respondents reported concern over the economic losses associated with food loss and waste, and many indicated that possible price reductions for the consumer would be a desirable method for reducing food loss and waste. This finding strongly suggests that outreach to businesses and food producers should focus on the economic argument for food loss and waste reduction first, with social and environmental messages being secondary.

Many respondents were not aware of the extent of the food loss and waste within their businesses and had not yet taken steps to reduce it.

Although many sellers revealed that they found food loss and waste to be troubling from economic, social and environmental standpoints, the majority had not yet taken concrete steps to reduce it within their own operations. This suggests that training and awareness-raising exercises (like this survey) would help to alert sellers to the benefits of addressing food loss and waste, as well as what options are available to them.

Changes to infrastructure would result in the largest impact.

Although individual actions by sellers can reduce food loss and waste within their own operations, the greatest obstacles to food loss and waste reduction identified by the survey respondents were all related to larger issues surrounding infrastructure, such as refrigeration and storage. Addressing these infrastructural concerns would help to benefit all sellers, and not just those who already have a high level of awareness of the issue of food loss and waste.

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