

#### **Table of Contents**

Background & Methodology

<u>Detailed Findings: State of Food Loss / Wasted Food</u>

Key Findings & Implications

<u>Detailed Findings: Waste Details</u>

Detailed Findings

51 <u>Detailed Findings: Food Recovery</u> <u>Landscape</u>

Detailed Findings: Food Mix & Food Loss

Detailed Findings: Firmographics



#### **Background & Methodology**

The Global FoodBanking Network (GFN) herein sought information from Mintel around how companies respond to food loss and waste, including current mix and magnitude of loss and waste and reasons behind it, as well as potential future solutions.

Mintel fielded an online insights survey approximately 20 minutes in length from November 1 to November 29, 2021. A total of **n=400 interviews** were completed among B2B respondents in relevant food manufacturing, handling, distribution, and retail space who have knowledge of the food supply chain.

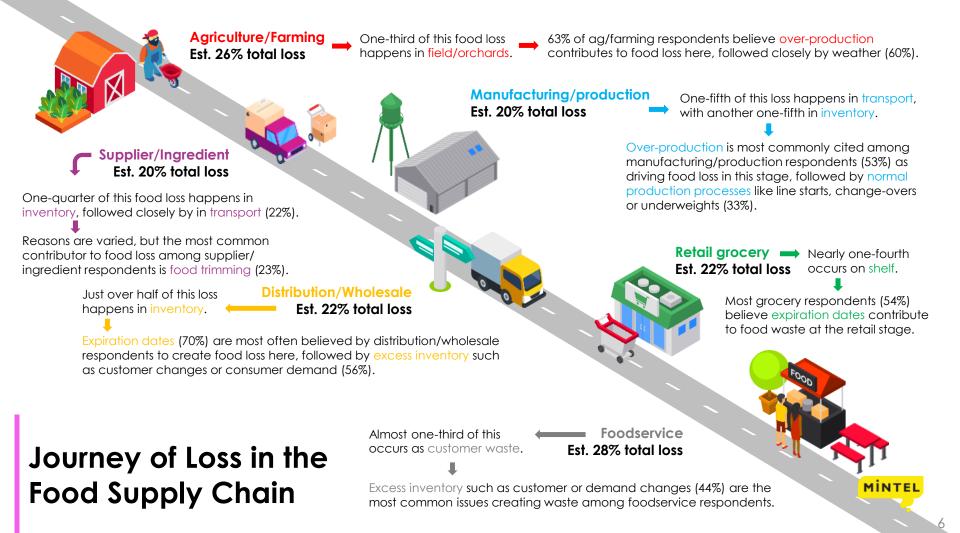
Bolivia	Costa Rica	Dominican Republic	Ecuador	Guatemala	Honduras	Nicaragua	Panama	Paraguay	Peru	Uruguay	
n=43	n=34	n=30	n=38	n=31	n=39	n=33	n=37	n=35	n=42	n=38	

This survey reviewed how food loss occurs at various points in the supply chain in relevant industries as well as how companies currently handle food loss. The survey reviewed awareness and usage of various food banks and other charities, identifying interest in and barriers to food recovery and donation. Specific reasons for food loss and waste including marketability, production/technical factors, market fluctuations, environmental or weather factors, quality degradation/product age, and transportation/distribution were also reviewed. Question numbers and text are referenced throughout the report.



#### **Key Findings: Current Landscape**

- Respondents estimate an average of 23.1% is lost at any point in the supply chain. 62% of respondents state that food is sold/given to employees, and 43% state their company donates to a food bank.
- Awareness of food banks is strong, but regular engagement could be stronger. 76% of respondents are aware of food banks and 62% are aware of GFN.
  - However, 18% of respondents surveyed report their company has a food recovery/donation program set-up today. Limiting factors for donation include transportation constraints (51%) and food expiration before distribution (49%), though those without active programs are also significantly more likely to cite a lack of understanding of options (44%) and inconvenient donation locations (39%) than those with active programs.
- Lost food is of course lost value for a company. COVID-19 had a profound impact on LATAM: half (50%) of respondents have experienced an increase in excess food due to the pandemic, suggesting more food loss than previous years. Understanding each industry in the supply chain is integral to engage companies and rescue food successfully.



## A detailed understanding of industry status and needs is key to informing your product sourcing strategy





- For those in the ag/farming industry, loss typically occurs in field. Top reasons of loss at this stage include over-production and weather (60%+ of respondents each).
- With over-production being a top reason for loss, over one-fourth (28%) of LATAM ag/farming respondents state they are incentivized to overproduce.
- In terms of environmental factors, pest infestations (e.g., swarming) most often impact those in ag/farming (80%), with flooding second in impact (among 62% of these respondents). Drought effects disproportionately impact ag over other parts of the chain (48%).

- The majority share of food loss (46%) occurs either in transport to the distributor/market or in inventory.
- Loss reasons are diverse here, though most common are **food trimming** (23%) and **over-production** (19%).
- Old/ineffective tools/machines create product waste in this industry when it comes to production/technical issues (60%), more often than any other industry. When looking at transportation, refrigeration and infrastructure issues are top drivers of loss (55% and 50%, respectively).
- Supplier/ingredient companies are least likely to have programs in place to reduce food loss (17%).



## Manufacturer / CPG Producer

- Similar to supplier/ingredient industry, manufacturers/CPG producer most food loss (44%) occurs in inventory or in transport to the distributor/market.
- Over-production is the single largest issue driving waste for this group (53%), followed by normal production processes like line starts (33%).
- Refrigeration and infrastructure issues drive transportation issues for producers (57% and 55% each).
- Manufacturers/producers are more likely to have programs in place to reduce food loss (42%) as well as food recovery/donation programs specifically (32%).

## A detailed understanding of industry status and needs is key to informing your product sourcing strategy



#### Distributor/Wholesaler/ Warehousing

- Food loss for these companies in LATAM skews slightly toward inventory (55%), with 45% occurring in transport.
- Expiration dates and excess inventory drive loss within this industry (70% and 56%, respectively).
- Refrigeration is the top issue when it specifically comes to transport (61%) and storage (83%) for distributors.
- When considering ways of recovering or donating products past sell-by date, this industry leads others for health and wellness concerns (93%, compared to the total average of 80%); it also coleads (with grocery) on actively working on innovations around expiration dates (41%).



#### **Retail Grocer**

- Most food loss occurs on shelf for retail grocery, attributed most to expiration dates. Customer waste is the second largest source of loss in grocery.
- Likely spurred by these expiration issues, most (63%) grocery respondents indicate their companies are actively working on solutions to extend shelf life.
- The largest share of excess food in grocery within LATAM is sold/given to employees (45%), higher than any other industry.
- Awareness of GFN is also highest among retail grocers (68%), though only a relatively average share of grocers in LATAM (16%) have a food recovery/donation program in place.



#### Food Service/Restaurant

- When it comes to food service, the largest share of food loss takes place in customer waste (31%), followed by on shelf (17%).
- Naturally, excess inventory (such as changes in consumer demand) contribute significantly to waste in LATAM's food service; among those experiencing planning issues, oversized portions or servings drive this trend the most (65%) which tend to occur on a daily to weekly basis.
- Most food service respondents (62%) indicate any increase in excess food due to COVID, higher than any other industry in the food chain.

#### **Key Findings: Across Industries**

- Top drivers of food loss regardless of industry include transportation, expiration dates, excess inventory (such as changes in customer/consumer demand), and machinery issues.
  - Refrigeration and adequate warehousing are top drivers of age/quality issues specifically.
- 51% of respondents in LATAM report transportation constraints or food expiration before distribution currently limit donation of lost food from their company, key challenges to address.
  - Respondents state their company would be interested in support with logistics and transportation (81%) or support with refrigeration and storing (80%). Connecting with each company to uncover specific points of loss and making donation seamless is crucial to a strong partnership.
- When it comes to LATAM companies, respondents express interest in partnership, with roughly respondents interested in being introduced to a local food bank to learn more (74%) and building connections with local food banks to partner and serve the community (67%).
  - Fuel interest around participation by both allowing and encouraging employee participation and promoting the company's support of the community, possibly by sharing stories similar to the Los Angeles Food Bank.

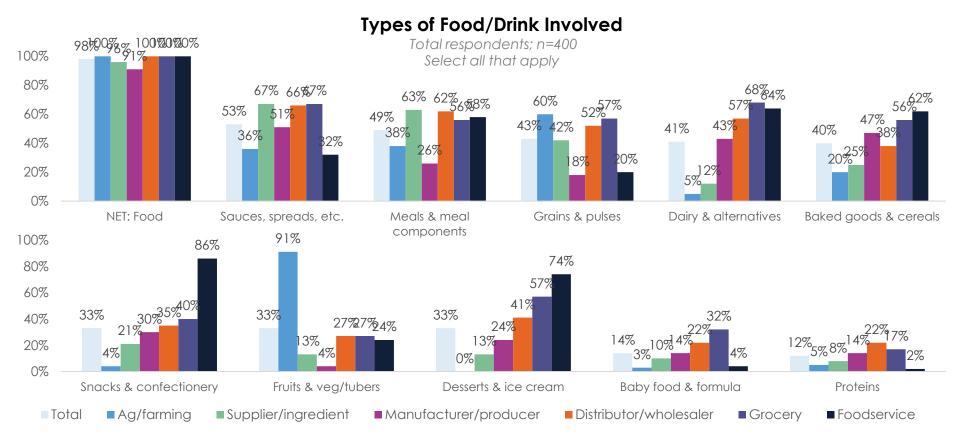


### FOOD MIX & FOOD LOSS

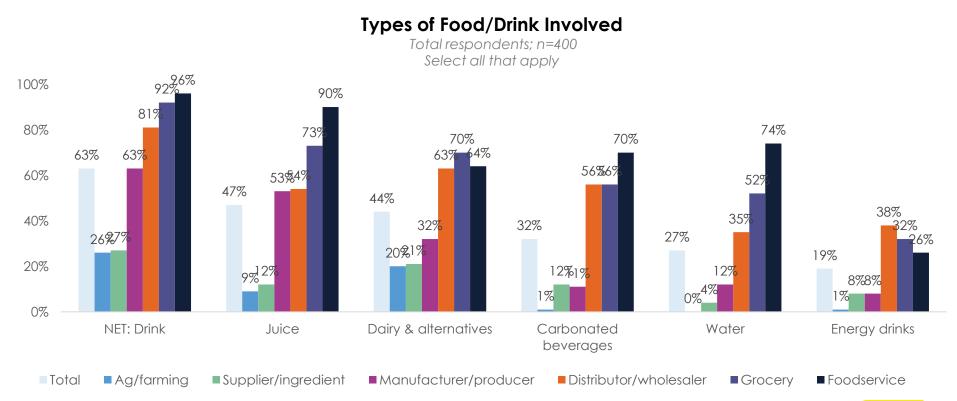
Understanding Food Mix



# Most respondents work in food, with prepared components like sauces and meals/components frequently involved (roughly 50% each).



# 63% of respondents work in drinks, with foodservice respondents the most heavily involved.



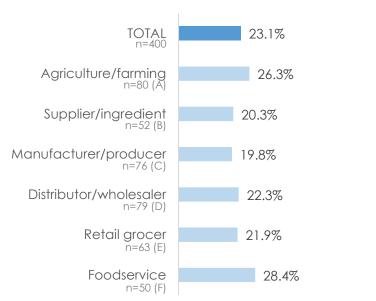


"Pérdida de alimentos" is the most widespread expression used, with just under 25% of all food/drink estimated to be lost at any point in the food supply chain.

# Use of "pérdida de alimentos" **Terminology** Total, n=40099% "Food loss" "Food waste"

#### Total Share of Food/Drink Lost

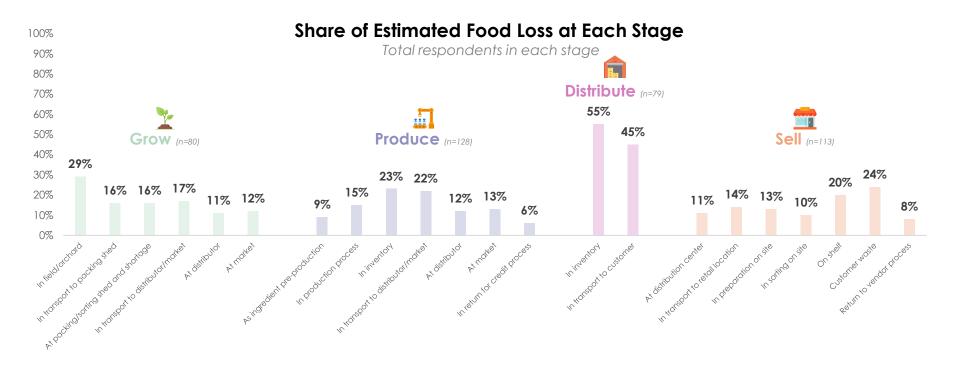
Self-estimated, by respondent industry





**A1.** Before we begin, though, how does your company reference food material that is not able to be sold for any reason? Is 'food loss' a good description? (Select one response) **A2.** Thinking, specifically, about the food and drink categories that your company **[FOODVERB]**s in **[COUNTRY]**, what is the total percentage of this type of food and drink that you estimate is lost at any point during the food supply chain? (Enter a percentage)

# Food loss causes are distributed relatively evenly across each industry; loss in agriculture skews earlier in that stage, while mid to later in other stages.



A3. Below is a list of seven stages of the food supply chain. Thinking about the total volume of food loss for your food and drink categories in [COUNTRY], how much would you estimate is lost at <u>each stage</u> in the food supply chain? Please enter the percentage of the total loss that occurs at each stage. The sum of the numbers you enter should equal 100. If you do not feel there is any food loss at a particular supply chain stage, please enter '0' next to that stage of the supply chain. Your best estimate is fine. (Enter a percentage. Must total 100.)



## Most respondents believe packaging (driven by machinery issues), transportation, and distribution (esp. expiration dates) contribute to food loss.

#### Reasons for Food Loss by Supply Chain Stage

Total respondents; n=400 Select all that apply

Packaging throughout		Transportation throughout		Distribution / wholesale / warehousing stage		Retail stage (grocery, foodservice)		Manufacture/ production stage		Agriculture/ farming stage*		Consumer consumption*		Food supplier/ ingredient stage*		
	Machinery issues	38%	Transportation issues	68%	Expiration dates	47%	Expiration dates	33%	Over-production	31%	Over-production	13%	Excess inventory / changes in demand	10%	Food trimming	6%
	Mislabeled foods / missing ingredients / allergens	33%	Weather impact	32%	Excess inventory / changes in demand	38%	Excess inventory / changes in demand	30%	Machinery issues	17%	Weather impact	12%	Expiration dates	9%	Over-production	6%
	Product blocking / mechanical mishandling	20%	Quality compromised by damage	27%	Stock rotation errors	34%	Seasonal / limited offer / promo items	20%	Normal production processes (line start/change overs)	16%	Normal production processes (line start/change overs)	9%	Seasonal / limited offer / promo items	8%	Normal production processes (line start/change overs)	6%
	Safety recalls / concerns	15%	Discontinued/slow moving products	21%	Product blocking / mechanical mishandling	28%	Imperfections (e.g., color, appearance)	19%			Food trimming	7%	Imperfections (e.g., color, appearance)	7%	Weather impact	5%
	Imperfections		Product blocking /				Stock rotation									

15%

Imperfections (e.g., color, appearance)

\*No single reason earned above 15% for consumer consumption and food supplier/ingredient stages; instead, top four reasons are displayed.

Quality



Stock rotation

(e.g., color,

appearance)

15%

mechanical

mishandling

Machinery issues

16%

Machinery issues

compromised by

26%

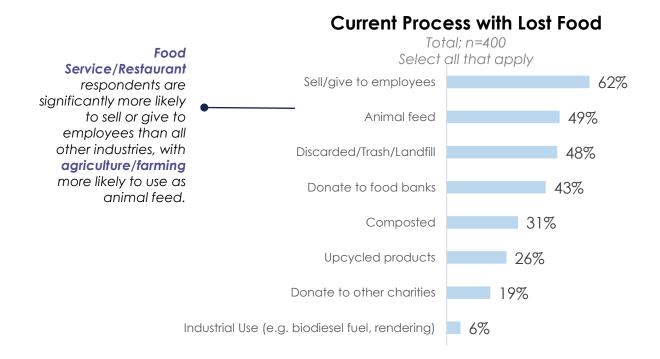
23%

## STATE OF FOOD LOSS

Current state of handling food loss and waste



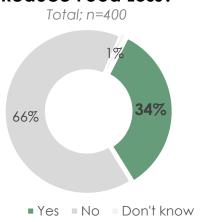
# 62% report that their company currently sells/gives lost food away to employees, with half stating it is used as animal feed or thrown out. Those familiar with food banks, as well as GFN are less likely to discard or throw it away.



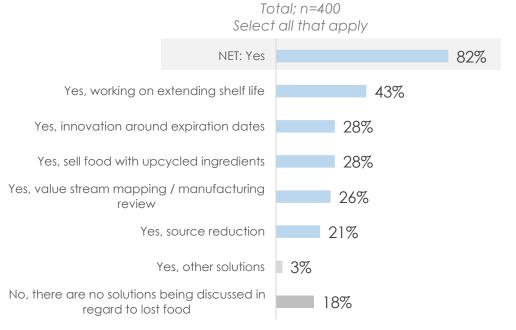


82% of companies are working on active solutions to repurpose lost food, only 34% report they have a current program or initiative in place. 43% of respondents state they are working on extending shelf life, followed by solutions around expiration date and upcycled ingredients.

## Current Programs/Initiatives to Reduce Food Loss?



#### **Active Solutions to Repurpose Lost Food**





## **28% report they are incentivized to overproduce.** LATAM respondents report lost food from overproduction is typically used for animal feed or composted.

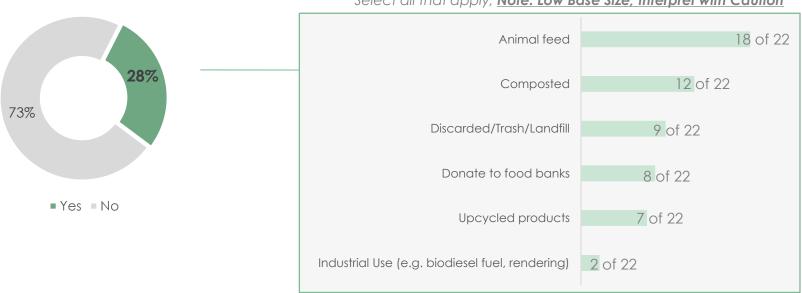


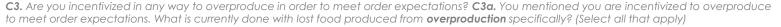
#### Incentivized to Overproduce?

Farming/Agriculture; n=80

#### Lost Food from Overproduction

Farming/Agriculture who overproduce for incentives; n=22\* Select all that apply; Note: Low Base Size; Interpret with Caution





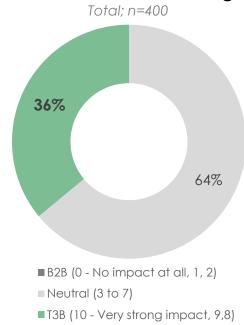


\*Low base size; interpret with caution

## Most respondents rated the impact of COVID-19 on how their company handles food loss a '5' or higher, with 36% feeling it has a strong impact.

#### Impact of COVID-19 on handling food loss

Respondents who express interest in a new or expanded food recovery or donation program are significantly more likely than those who do not to rate the impact of COVID as very strong (67% T3B score vs. 23%).

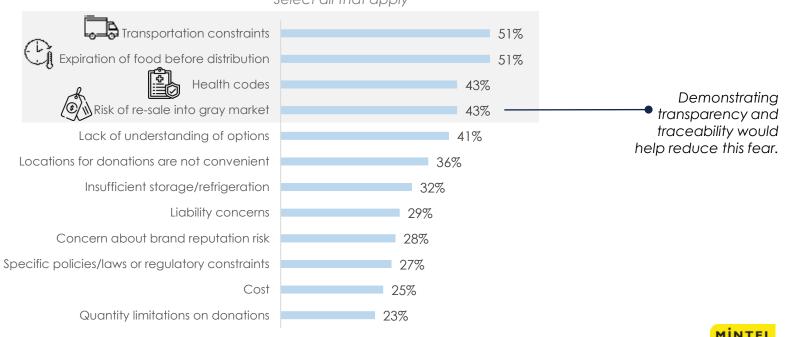




Transportation and food expiration emerge as the top factors that limit food donation, followed by health codes and re-sale risk. Limiting factors are not significantly different between countries or industries.

#### **Factors that Limit Donation**

Total; n=400 Select all that apply

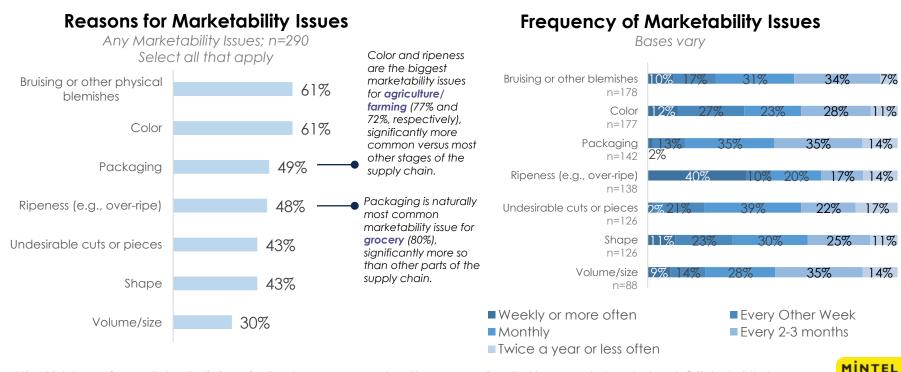


### **DETAILS: MARKETABILITY**

Discontinued / Slow moving product, Seasonal / Limited Offer / Promotional Items, Quality Compromised by Damage, Food Trimming, Mislabeled Foods / Mislabeled Ingredients / Allergens, Imperfections



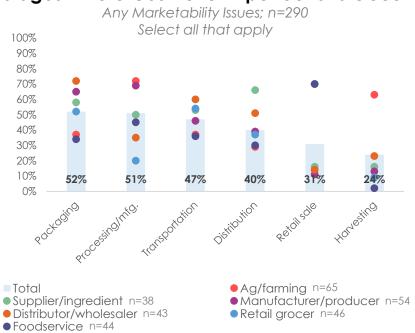
# Physical blemishes are the most universal marketability issue overall, but product ripeness, however, occurs more frequently (weekly-plus).



M1. Which types of cosmetic/aesthetic imperfections have you encountered in your operations that have created product waste? (Select all that apply.) M3. About how frequently do you experience imperfections and subsequent product waste in your operations for each of these areas? (Select one response for each row. Your best estimate is fine.)

# The packaging and processing stages see most cosmetic imperfections (packaging mostly in distribution and processing in ag and production).

#### **Stages Where Cosmetic Imperfections Occur**



#### **Marketability Assessment Location**



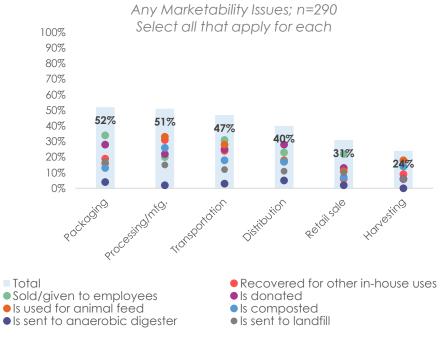
A vast majority of **agriculture**, **supplier**, **grocery**, and **foodservice** respondents (69%, 82%, 70%, and 80% respectively) assess marketability among "frontline" workers (e.g., pickers).

**Distributors/wholesalers** tend to assess on the frontline and with specific QA teams about the same. Meanwhile, **manufacturer/producer** companies skew toward specific QA teams (65%).



# Packaging imperfections tend to be routed toward employees or donations, while processing/manufacturing imperfections skew toward repurposing.

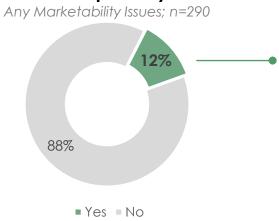
#### **Fate of Products with Imperfections**





## Efforts are seldom made to influence acceptability of imperfect products, but when they do, discounts are used or product quality is re-messaged.

## Ever Tried to Change/Influence Acceptability



Those who have a **food recovery or donation program in place** are directionally
more likely to have ever tried to
change/influence acceptability of
imperfect products than those without.

Most strategies to influence change/acceptability of imperfect products revolve around lowered price, but some have frustrations with this:

#### Sample verbatim (translated):

"We have tried this in the past, but it did not work well. We try to sell the rejected food at a lower price, but that hampers our brand image, so we stop doing it."

"We do not directly convince our partners; instead, we offer them products with minor defects at a discounted price, which helps us maintain our checking account."

"We have gotten tired of convincing our customer about the food product if it has some irregular shape but is good to consume. If the consumer agrees, we sell it at a reduced price."

"We have tried to sell our food product at a discount on a few occasions. If food is rejected due to any of our quality requirements, we have tried to convince our customers of the quality of the food."

"There are a lot of buyers ready to buy defective products until they are ready to be consumed, we just need to sell at a price lower than the base price."

"There are very few occasions when we need to persuade a buyer, as most customers understand if the package is partially broken and will buy the product at a lower price."

"There are smart shoppers associated with us who take the opportunity to buy products at a lower price, so it is easy for us to convince them."

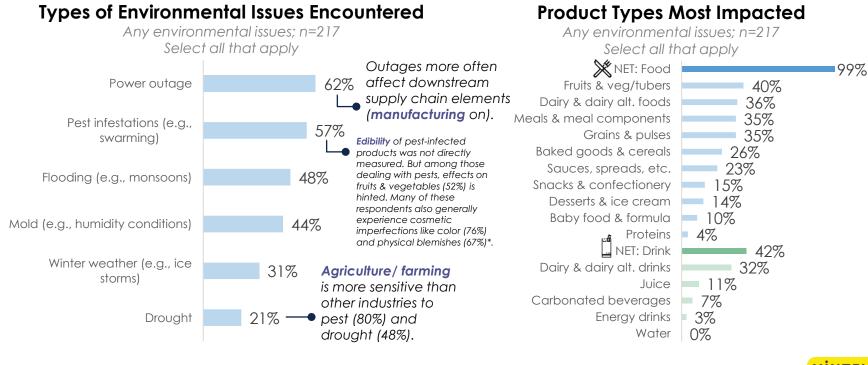


# DETAILS: ENVIRONMENTAL OR WEATHER FACTORS

Weather Impact



## Pests and power outages are the biggest environmental drivers of product waste, with pests affecting ag and power outages downstream in the chain.



E1. Which type(s) of environmental factors have you encountered in your operations that have created product waste? (Select all that apply.)

E4. Briefly, what types of products in your operations are most impacted by these weather events (and most likely to be wasted)? (Select all that apply.)

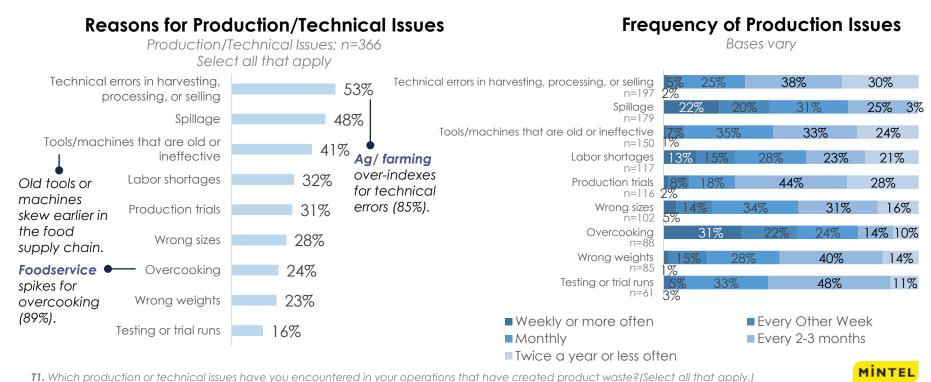
\*While some stored commodities may be considered technically edible even if pest-infected, a recent study here analyzes nutritional losses due to pests

# DETAILS: PRODUCTION & TECHNICAL FACTORS

Over-production, Machinery issues, Normal Production Processes, Stock Rotation, Product Blocking / Mechanical Mishandling / Loss of Power



# Technical errors and spillage are the most common production issues, with spillage occurring more frequently (most instances weekly to monthly).



<sup>71.</sup> Which production of rechilical issues have you encountered in your operations that have created product waster belief all that apply, f

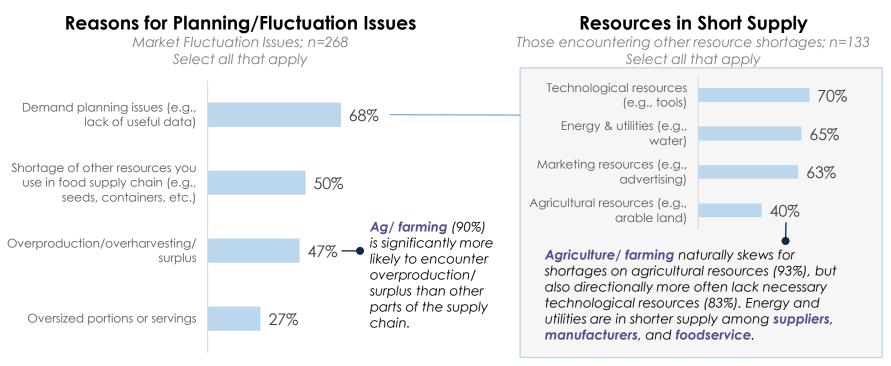
**<sup>72.</sup>** About how frequently do you experience production issues and subsequent product waste in your operations for each of these areas? (Select one response for each row. Your best estimate is fine.)

### **DETAILS: MARKET FLUCTUATIONS**

Excess Inventory / Changes in Customer / Consumer Demand

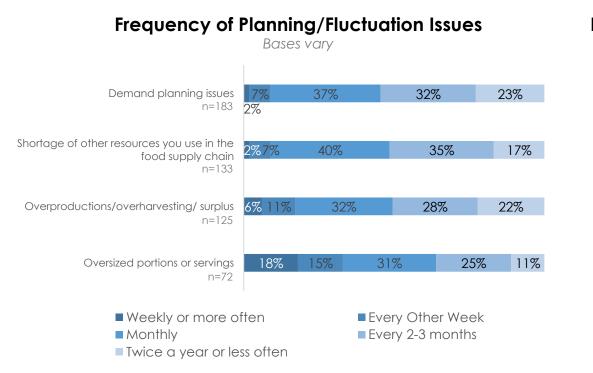


# Among those experiencing planning issues, demand planning (e.g., lack of useful data) is most common, followed closely by resource shortages.



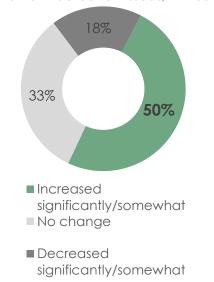


## The most common planning issues tend to happen on a monthly basis, though COVID has increased excess product for about half of all firms.



## Degree of COVID's Impact in Creating Excess Food/Drink





**P2.** About how frequently do you experience planning issues and subsequent product waste in your operations for each of these areas? (Select one response for each row. Your best estimate is fine.) **P4.** Thinking about your total volume of food loss for reasons selected, how has COVID impacted the amount of excess food created by your company? (Select one response)

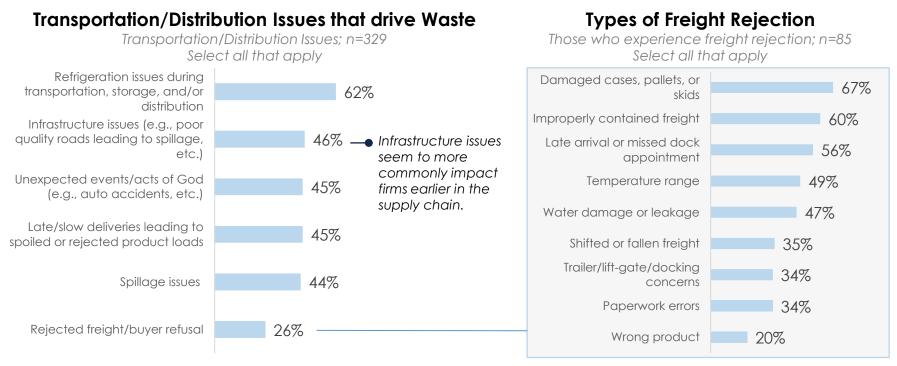


# DETAILS: TRANSPORTATION & DISTRIBUTION

Transportation Issue



## Most transportation issues stem from refrigeration. Freight rejection happens less, but is driven by damaged implements or improper containment.



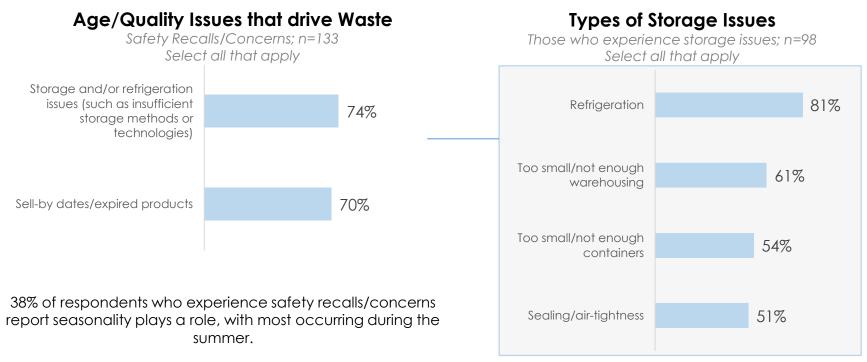


# DETAILS: PRODUCT AGE, CLOSE TO CODE, QUALITY DEGRADATION

Safety recalls / Concerns



## Storage and expiration issues occur at roughly the same rate in LATAM, with refrigeration and warehousing availability creating storage issues most.

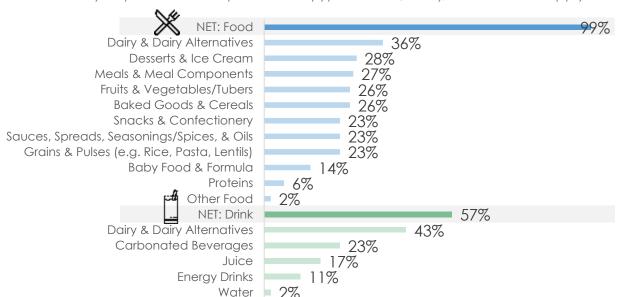




## Food products (especially dairy) are most impacted by safety issues. Health and wellness are behind most concerns for product recovery or donation.

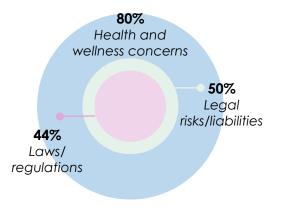
### Products Most Likely to Have Safety Recalls/Concerns

Those who selected Safety Recalls/Concerns;
Bases vary dependent on response at S5 (type of food/drink); Select all that apply



# Concerns for Recovering/Donating Food Past Sell-by-date

Safety Recalls/Concerns; n=133 Select all that apply





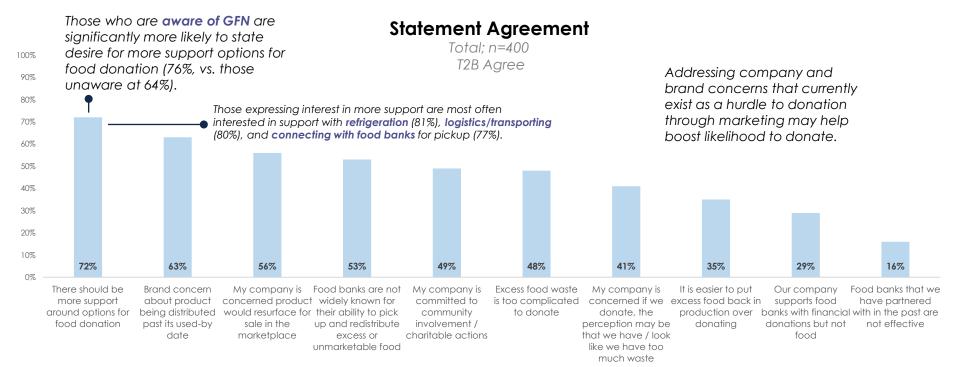


### FOOD RECOVERY LANDSCAPE

Food Bank Awareness & Interest



# 72% respondents agree there should be more support around food donation options. Circulation issues are a big barrier for donation, with 63% concerned about past-due distribution and 56% about resurfacing in the marketplace.



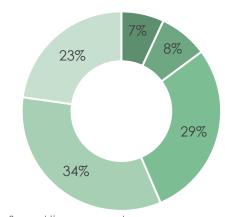


### Most have packaged goods (specifically dry) to donate, with most having excess food available once a month or every few weeks.



### Frequency of Excess Food

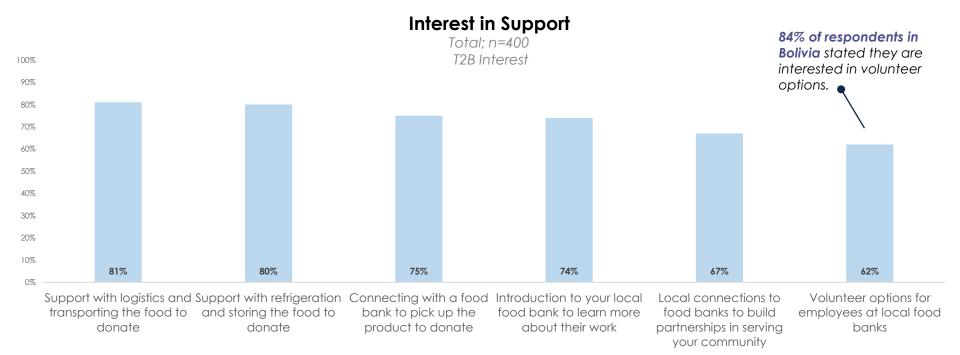
Total; n=400



- Several times per week
- Once per week
- Less than once a week, but several times per month
- Once a month
- Less often than once a month



# At least 80% of respondents state their company would be interested in transportation and storage support. LATAM respondents are also interested in understanding more about the process and feeling connected to the food bank.





# Transparency around practices and donation as well as assistance with coordinating the donation emerge as key factors to engage companies to work with a food recovery organization.

### Factors Required for a Food Recovery Organization

Total; n=400

"The option of volunteering for our employees, the easy pickup at our site, and the timely delivery of donated food are some of the factors to consider." – **Uruguay** (Retail Grocer)

"There should be more clarity

by the end of the food bank on the recipients of donations." – **Costa Rica** 

(Manufacturer / Consumer

Packaged Goods Producer)

organization must provide adequate support by providing transportation and experienced volunteers." – **Paraguay** (Agriculture/Farming)

"To work successfully with us, the

"There are some associated transportation costs when we donate food; It would be great if food recovery organizations can help us through the transportation process."

- Foundar

storage sup future." – **Nic**o

"We need adequate refrigeration and storage support to donate food in the future." – **Nicaragua** (Agriculture/Farming) (Distributor / Wholesaler / Warehousing)

"To work with us, you must support with your transportation and logistics." - **Bolivia** (Supplier / Ingredient Company) "Transparency on operations and awareness programs on reducing food waste." - **Guatemala** (Supplier / Ingredient Company)



### **FOOD BANK AWARENESS**

Food Bank Awareness & Participation

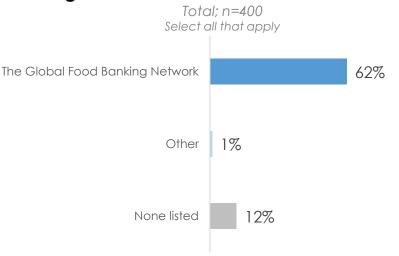


# **62% of respondents are aware of GFN, with 76% reporting awareness of food banks in general.** At least 70% of respondents in Ecuador, Dominican Republic and Nicaragua report awareness of GFN.

# Aware of Food Banks? Total; n=400 24% 76%

Yes No

### Organization Awareness: Food Charities



**D00.** Are you aware of food banks – organizations that operate in the way we've been discussing: accessing excess food from partners at all points of the supply chain and redistributing it to men women and children in need so that it feeds people and doesn't go to waste? **D0.** Below is a list of charitable and community organizations. Before taking the survey today, which of the following organizations were you already aware of? (Select all that apply)

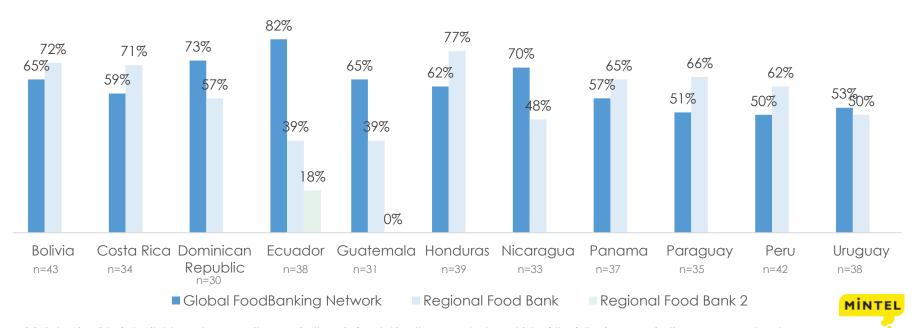


Awareness of GFN exceeds local food bank awareness in countries such as the Dominican Republic, Ecuador, Guatemala, Nicaragua and Uruguay. At least half of respondents in all countries have heard of GFN, closely behind some local food banks if not above it.

### Organization Awareness: Food Charities – By Country

Bases vary; Regional foodbanks vary dependent on country (see appendix for details)

Select all that apply



# The majority of respondents report they are aware of UNICEF, with only 40% stating their company currently works with any charitable organization. Of

those who do work with an organization, GFN and UNICEF are top.

#### **Organization Awareness: Other Charities** Total: n=400Select all that apply UNICEF 83% Red Cross/Red 34% Crescent World Vision 21% CARE 21% Caritas 5% Doctors without **Borders** Salvation Army 6%

5%

None of the above

### **Charities: Currently Work With**

Those aware of any organization; n=380

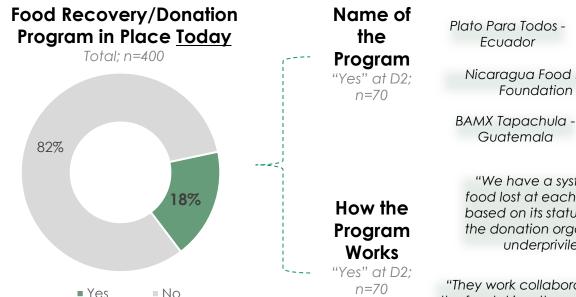
60%

State their company <u>does not</u> currently work with any charitable organization

Of those who do, top organizations are The Global Food Banking Network (11%) and UNICEF (9%) in addition to larger country specific food banks.



# Just 18% of LATAM respondents report their company has a food recovery/donation program in place today. Those who do report working with local food banks, with multiple respondents working with GFN and UNICEF.



Plato Para Todos Ecuador

Ecuador

Network – Honduras,
Uruguay, Peru, Dominican
Republic, Guatemala

Nicaragua Food Bank
Foundation

AFS COMITE
UNICEE – across COCHABAMBA

Global FoodBanking

UNICEF – across COCHABAN X Tapachula - multiple - Bolivia Guatemala countries

"We have a system that tells us the total amount of food lost at each of our locations. We segregate food based on its status for use, act accordingly, and notify the donation organization to distribute the food to the underprivileged" – Uruguay (UNICEF, GFN)

"They work collaboratively and send their volunteers for the food drive, they also give us the option to participate and donate food to the right people." – Panama (Banco de Alimentos Panama)

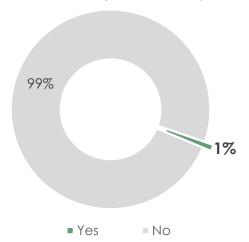


**D2.** Does your company have a **food recovery or donation program** in place today? (Select one response) D**2a.** What is the name of the food recovery or donation organization that your company currently works with? (Please briefly describe) **D2b.** In your own words, please describe how this **food recovery or donation** program works at your company? (Please briefly describe)

# Only 1% of respondents who <u>do not</u> have a program set up state their company has participated in a food recovery or donation program in the **past.** However, 30% of all respondents are interested in a new program.

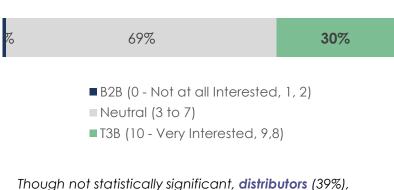
### Past Company Participation in Food Recovery/Donation Program

Those who do not currently have one in place; n=304



### Interest in Participating in New or Expanded Food Recovery/Donation Program

Total: n=400



manufacturer/CPG producers (33%), food service/restaurant (32%) and suppliers/ingredient companies (31%) are most likely to be interested.



D3. To your knowledge, has your company <u>ever</u> participated in a **food recovery or donation program** in the past? (Select one response)

D4. And using the scale below, please rate how interested your company would be in participating in <u>new or an expanded</u> food recovery or donation program within the next 12 months? (Select one response)

### **FIRMOGRAPHICS**

Firmographics



### **Firmographics**



- **Title:** Most respondents hold the title of Manager or Senior Manager.
- **Industry**: Respondents almost evenly represented each industry of the food supply chain.
- **Tenure:** The majority of respondents have been in the industry 5 to 14 years, and at their current company for about 5 to 9 years.
- Company Footprint: Most respondent firms are mid-sized: 67% report their company has 4 or fewer locations globally, with 65% having 50 to 499 employees.



### Food Charities by Country:

Country	Charities Displayed	
Bolivia	Banco de Alimentos de Bolivia	
Costa Rica	Banco de Alimentos Costa Rica	
Dominican Republic	Banco de Alimentos República Dominicana	
Ecuador	Banco de Alimentos Diakonía, Banco de Alimentos de Quito	
Guatemala	Banco de Alimentos Guatemala, Desarollo en Movimiento	
Honduras	Banco de Alimentos Honduras	
Nicaragua	Fundación Banco de Alimentos Nicaragua	
Panama	Banco de Alimentos Panamá	
Paraguay	Fundación Banco de Alimentos Paraguay	
Peru	Banco de Alimentos Peru	
Uruguay	Banco de Alimentos Uruguay	



### Terminology:

Potential reasons for food loss across each stage of food supply chain:	Directed To:	
Over-production	Production/Technical	
Excess inventory / changes in customer / consumer demand	Market Fluctuations	
Discontinued/slow moving products	Marketability	
Seasonal / limited offer / promotional items	Marketability	
Quality compromised by damage	Marketability	
Weather impact	Environmental or Weather Factors	
Safety recalls/concerns	Product age / close to code /quality degradation	
Food trimming	Marketability	
Mislabeled foods / missing ingredients / allergens	Marketability	
Machinery issues	Production/Technical	
Normal production processes [line start / change overs / underweights]	Production/Technical	
Product blocking / Mechanical mishandling / loss of power	Production/Technical	
Imperfections (e.g. color ,appearance)	Marketability	
Expiration dates	Product age / close to code /quality degradation	
Stock rotation errors	Production/Technical	
Transportation issue	Transportation/Distribution	MINTE

Reasons for Food Loss

### Potential Innovations and Food Waste

While still in the distant future, several developments may impact the way food waste is created and handled:



#### Automation and robotics in agriculture

More controlled dosages reduce input wastes, and 3D printing may use perishable or by-product waste



#### Personalized nutrition

Biologically tailored food deepens one's connection to the food system and reduce waste



#### Circular feed and upcycling

Production of microbial protein from organic waste streams increases economic value of waste



#### Smart and/or nano-tech packaging

Biosensors reduce consumer waste through behavioral nudges based on date labels



#### Cellular agriculture (lab-grown meat)

Prime cut alone is produced, mitigating waste created by traditional carcass trimming



#### Blockchain technology

Rapid response contaminant tracing helps avoid unnecessary food disposal and limit loss/waste



#### Non-thermal processing technologies

Traditionally perishable products are stored longerterm at room-temperature Understanding these technologies and their impact on the supply chain may not be necessary in the immediate, but looking forward, food banks may need to account for these in shaping their strategy of company engagement.



### **Questions? Get in Touch!**



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