Establishment Survey in the Food and Beverage Sector in Guatemala

Full Report

Lucy Cutting and Lauren Robertson

April 2022

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Recognitions

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Introduction

The American Institutes for Research (AIR),[1] funded by the US Department of Labor Bureau of International Labor Affairs, is implementing the project *Labor Market Supply and Demand in El Salvador, Guatemala, and Honduras: Leveraging Data to Build an Efficient Labor Market*. The objective of this project is to provide technical assistance to El Salvador, Guatemala, and Honduras to improve labor market efficiency and performance by assisting these countries to develop labor market information (LMI) systems that publish reliable, comprehensive, and current LMI in user-friendly formats. It also seeks to create local capacities in the use of LMI. One of the main components of this project is to facilitate the creation of a pilot establishment (see Appendix E.I for definition) survey for each country that captures labor demand data in a high-growth economic sector.

In collaboration with the Guatemalan Chamber of Food and Beverage (*Cámara Guatemalteca de Alimentos y Bebidas*) (CGAB) and the Guatemalan Chamber of Industry (*Cámara de Industria de Guatemala*) (CIG), the AIR team conducted a pilot telephone survey[2] of establishments between July and December 2021 in the food and beverage manufacturing (Appendix E.II) sector. This report disseminates the pilot survey findings from Guatemala.

What is an Establishment Survey?

An establishment survey collects data to generate and disseminate LMI related to employment characteristics that are in demand in a country's chosen sector.

The AIR team implemented standardized methodologies and international best practices to collect information that:

- Characterizes the labor demand of the primary positions in the chosen sector (e.g., educational training, requirements, competencies);
- Determines the number of current hires as well as the future demand for jobs in the chosen sector; and
- Identifies the current and medium-term training needs of the chosen sector.

1. IMPAQ International LLC, the implementing entity on past LMI establishments surveys, was acquired by AIR in May 2020, formerly operated as a wholly owned subsidiary of AIR in 2021, and as of January 1, 2022, is now AIR.
2. The survey title was the Food and Beverage Sector Survey in Guatemala 2021 (*la Encuesta de Establecimientos en el Sector de Alimentos y Bebidas (ENESAB) en Guatemala 2021).*

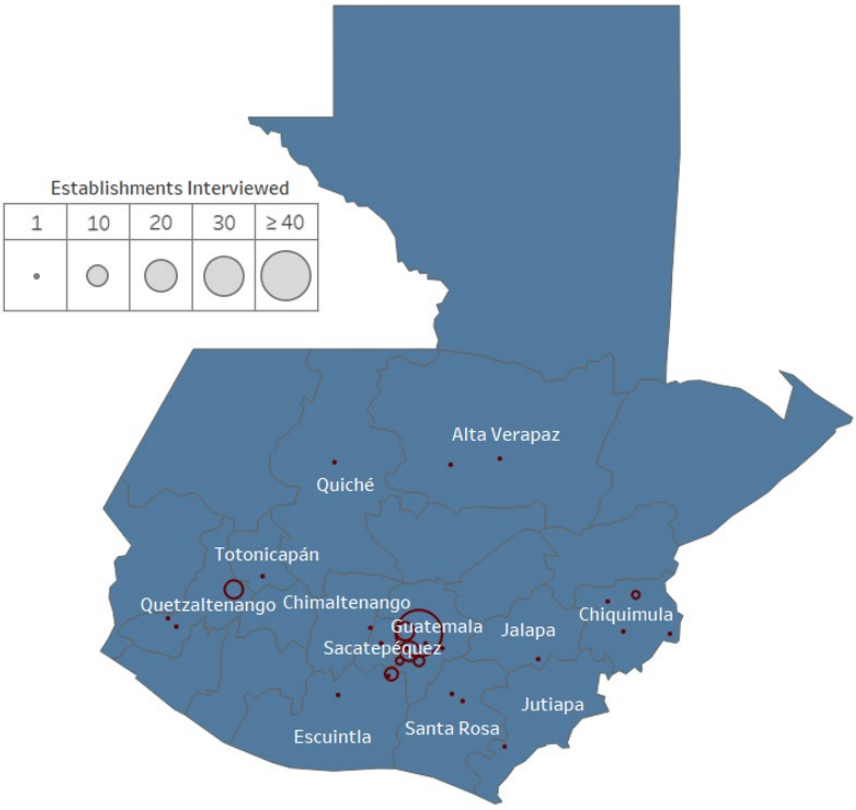
Nationally representative demand-side LMI could provide potential employees as well as universities and technical and vocational education and training institutions with crucial labor market demand information such as required qualifications, job positions that are in high demand, and remuneration across jobs. This information is a resource for potential employees' decision-making about education, training, and career goals as well as for educational institutions, providing critical information to update their curricula in response to current labor market needs.

Implementation of the Establishment Survey in the Food and Beverage Sector in Guatemala 2021

Geographic Reach

The AIR team successfully implemented the pilot survey in the departments of Guatemala that pertain to the registries sourced by local affiliates, including the Bank of Guatemala and the Guatemalan Chamber of Industry (see the Target Population and Survey Objective sub-section). Exhibit 1 illustrates the geographic distribution of the surveyed establishments[3] by department.[4]

Exhibit 1. Geographic Reach of the Establishment Survey, by Department



3. The term surveyed establishments refers to the 106 establishments that completed or partially completed the survey.
4. Survey respondents spanned 12 of the 22 departments of Guatemala. The 10 departments that are not present include Sololá, San Marcos, Retalhuleu, Suchitepéquez, Zacapa, El Progreso, Baja Verapaz, Huehuetenango, Izabal, and Petén.

Coverage by Size

During the data collection and data cleaning process, the AIR team decided to exclude establishments with fewer than two workers, which represents one of the eligibility criteria for the pilot establishment survey. This criterion reflects concerns that workers in very small establishments, namely establishments with less than two employees, typically execute a wide variety of tasks that correspond to more than one job position, making it difficult to classify their job position.

Unit of Analysis and Key Informants

The unit of analysis is the establishment, compensated employees, and job positions for filled and future demand. In most cases, the informant was the establishment's owner, manager, administrator, or human resources manager.

Target Population and Survey Objective

The population of interest for the pilot survey was private sector establishments that were operational with two or more employees between July 2020 and July 2021 and whose principal or secondary economic activity during that time included at least one of the following activities in the manufacturing sector: Manufacture of Food Products (Appendix E.III) and/or Manufacture of Beverages (Appendix E.IV).

Due to the lack of updated, nationally representative administrative records on establishments in the sector of interest, the AIR team identified establishments for this pilot survey with available data. More specifically, the AIR team compiled a list of potentially eligible establishments with three sources: (1) the Bank of Guatemala's 2013 National Directory of Companies and their Premises (*Directorio Nacional de Empresas y sus Locales*) (DINEL); (2) the compiled[5] business registry of the Guatemalan Chamber of Industry Guatemala (*Cámara de Industria de Guatemala*) (CIG), the National Competitiveness Program (*Programa Nacional de Competitividad*) (PRONACOM), and the Food and Beverage Union of Guatemala (*Gremial de Alimentos y Bebidas de Guatemala*) (GREMAB); and (3) the Trade Map database of the International Trade Centre (ITC), which we accessed and cleaned in March 2021.[6] In total, the establishment list for the pilot survey consisted of 255 establishments with economic activities or products that pertain to the food and beverage manufacturing sector. For further details on the establishment list construction, please refer to Appendix A.

5. This data source is itself a compilation of businesses from three different Guatemalan entities. AIR did not compile this specific data source but rather used it in its totality for the compiled establishment list for the pilot survey.
6. By source, the compiled pilot survey establishment list included 138 establishments from the DINEL Guatemala registry, 57 from the compiled CIG-PRONACOM-GREMAB business registry, and 60 from the Trade Map database. After accounting for duplicates among these three sources, we attempted to include all potentially eligible establishments (i.e., with economic activities and/or products relevant to the food and beverage manufacturing sector) from these sources with, at minimum, valid telephone numbers.

In considering the available data, the objective of the pilot survey was to take a census of local registries of establishments operating in the sector of interest. However, due to constraints in constructing the compiled establishment list and field challenges with telephone data collection (e.g., did not answer, refusals) (Appendix A), the pilot survey did not yield a census of these aforementioned Guatemalan registries. Of the 255 establishments we attempted to contact for the pilot survey, 106[7] establishments in the sector of interest responded to the survey, which represents a 48 percent response rate (Appendix A).

7. Among these 106 respondents, one respondent partially completed the survey.

Results

In this section, we present general information about the surveyed establishments as well as demographic data about their employees. We also highlight the characteristics of the key occupations that the surveyed establishments identified, including their educational requirements, core competencies, current employment levels, and future staff demands. We conclude this section with information regarding personnel training tendencies among surveyed establishments as well as information that specifically pertains to the state of these establishments in the context of the COVID-19 pandemic. All results reflect the situation of the establishments at the time of data collection, which occurred amid the COVID-19 pandemic, and are rounded to the nearest whole number.[8]

For general establishment-level information, we disaggregate the results by establishment size and by region where possible. We define establishment size in terms of number of employees, which includes four categories: (1) micro (1 to 10 employees)[9]; (2) small (11 to 80 employees); (3) medium (81 to 200 employees); and (4) large (more than 200 employees) (Appendix E.V). By region, we disaggregate results into four regions: (1) the Central Region, (2) the Metropolitan Region, (3) the Northern Region, and (4) the Southern Region.[10]

For occupation-level information, we disaggregate results by the job positions that surveyed establishments most frequently reported as their most numerous in terms of recruitment volume. These results depict the characteristics of the job positions, not of the workers who occupy these positions.

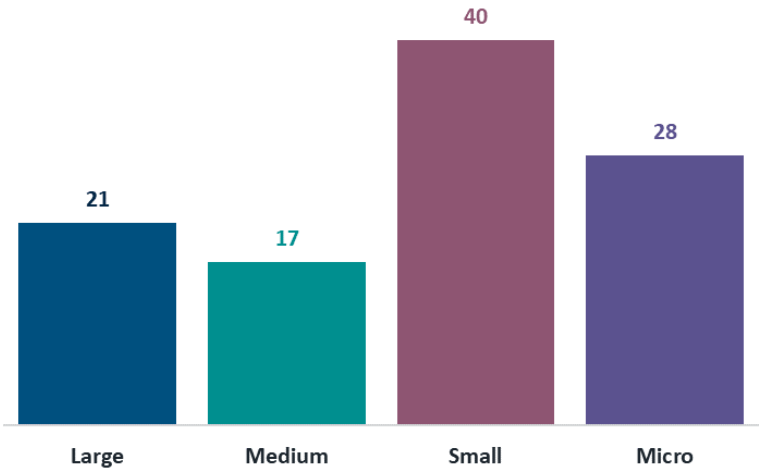
Due to the presence of outliers in the demographic data on establishment workers, we trimmed outliers at the upper bound of the 95th percentile for the total number of full- and part-time employees, which serves as the determinant for associated statistics on workers by establishment size (Exhibit 4), gender (Exhibit 5), age range (Exhibit 6), job position (Exhibit 7), and training module (Exhibit 15). See Appendix C for robustness checks (i.e., Winsorization).

8. Since we round results to the nearest whole number, some results expressed in percentages may total to more or less than 100 percent though they indicate the total. Instances in which this occurs in the Results Section is due to rounding error.
9. As previously mentioned in the Introduction Section, AIR only surveyed micro establishments that had a minimum of two employees for the pilot survey.
10. Due to the low number of respondents by department, we disaggregate results by region rather than department. We sourced the list of Guatemalan regions and their corresponding departments from local partners at the Guatemalan National Institute of Statistics (*Instituto Nacional de Estadística de Guatemala*). This list specifies seven regions: (1) the Metropolitan Region, (2) the North Region, (3) the North-East Region, (4) the North-West Region, (5) the South-East Region, (6) the South-West Region, (7) the Central Region, and (8) the Petén Region. For illustrative purposes, we combined the North, North-East, and North-West regions into the Northern Region (n = 8). We also combined the South-East and the South-West regions into the Southern Region (n = 14). For a list of departments by region, please refer to Appendix B.

Number of Establishments

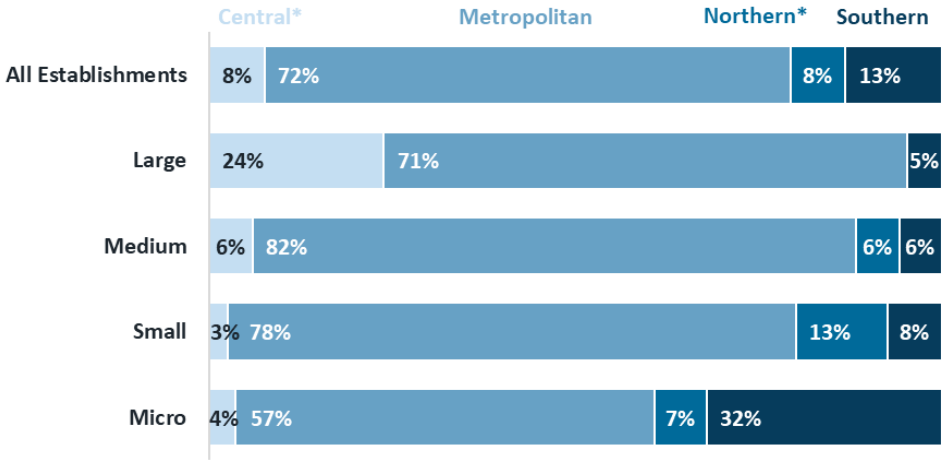
Of the 106 establishments in the food and beverage manufacturing sector that responded to the pilot survey, 26 percent (n = 28) are micro establishments, 38 percent (n = 40) are small establishments, 16 percent (n = 17) are medium establishments, and 20 percent (n = 21) are large establishments (Exhibit 2).

Exhibit 2. Number of Surveyed Establishments, by Establishment Size



As shown in Exhibit 3, the surveyed establishments are predominantly located in the Metropolitan Region (72 percent), which contains the department of Guatemala. This is consistent among establishment size. Compared to medium and small establishments, a greater share of large establishments (24 percent) is in the Central Region, and a larger proportion of micro establishments (32 percent) are in the Southern Region. However, there is a small sample size for large (n = 5) and small establishments (n = 9) in the corresponding regions.

Exhibit 3. Regional Distribution of Establishments, by Establishment Size and Region

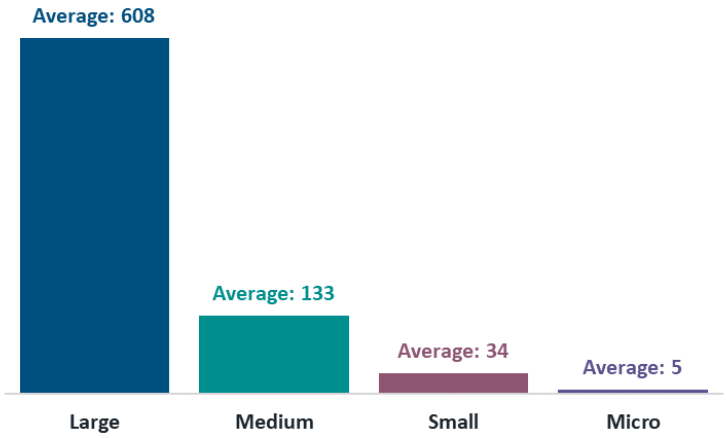


Note. *The total number of surveyed establishments in the Central and Northern Region was eight each. Although robust estimates cannot be made with such a limited sample, we report results from these regions for illustrative purposes and include them in all aggregate results.

General Findings about Employees

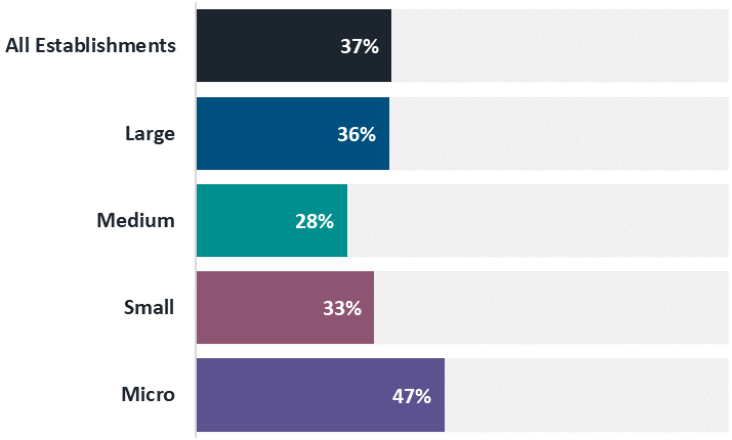
The surveyed establishments reported a total of 13,495 full- and part-time employees in 2021.[11] By establishment size, large establishments reported a total of 9,733 employees, which is equivalent to an average of 608 employees per establishment (Exhibit 4). Medium establishments reported 2,258 employees, representing an average of 133 employees per establishment. Small and micro establishments reported 1,352 and 152 employees, respectively, with an average of 34 and 5 employees, respectively, per establishment.

Exhibit 4. Average Number of Employees per Establishment in 2021, by Establishment Size



Of the surveyed establishments, females represent 37 percent of employees, on average (Exhibit 5). However, discrepancies exist between the establishment sizes. Compared to the other three establishment sizes, medium establishments report the lowest share of female employees (28 percent), on average. Micro establishments have the highest average rate of female labor force participation (47 percent), followed by large establishments (36 percent).

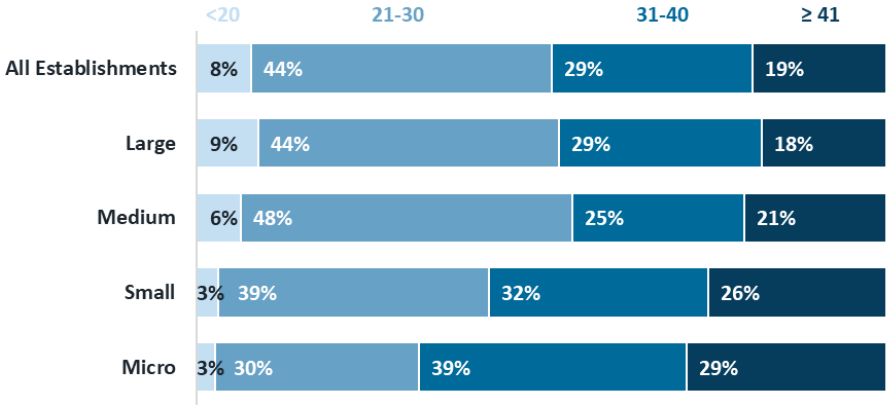
Exhibit 5. Average Female Labor Force Participation Rate, by Establishment Size



11. The total number of employees in 2021 corresponds to the pilot survey's reference period for this specific survey question, which asked establishments to report the number of full- and part-time employees they had within the last three months.

Among their employees, surveyed establishments reported that most, on average, are 21 to 30 years old (44 percent), followed by employees 31 to 40 years old (29 percent). While nearly a fifth (19 percent) of their employees are over 40 years old, only eight percent are under 21 years of age, on average (Exhibit 6). By establishment size, large establishments have a greater share of employees under the age of 21 (nine percent). By contrast, micro establishments report a higher proportion of employees ages 41 or older (29 percent) and a larger share of workers in the 31 to 40 age range (39 percent) relative to the other establishment sizes.

Exhibit 6. Worker Age Distribution, by Establishment Size



Note 1. Among survey respondents, 17 establishments, did not provide information on the number of workers by age range; by establishment size, this encompasses six large, four medium, and seven small establishments. After trimming outliers, this exhibit represents results for 86 of the 106 surveyed establishments.

Note 2. Given the outlier detection and treatment method (Appendix C), six large establishments report influential values for specific age ranges. Results for this exhibit are particularly sensitive to the outlier treatment method. Please refer to Appendix C for further details.

Key Occupations in the Food and Beverage Sector

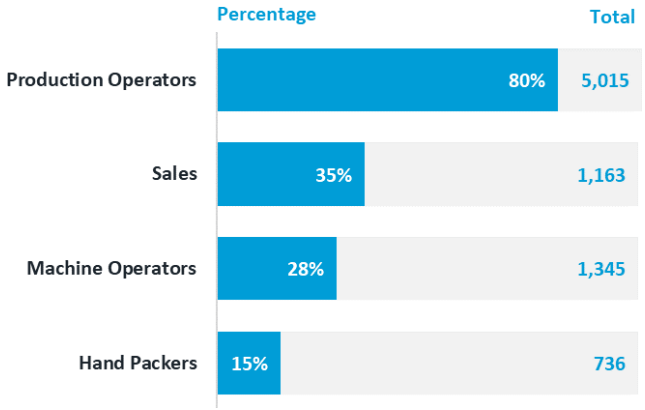
In this section, we present information on the characteristics of key job positions in the food and beverage manufacturing sector. Prior to conducting the pilot survey, the AIR team consulted local experts on the sector to identify (1) the most important job positions and (2) the positions with the highest recruitment volume. Through these consultations, AIR narrowed a broad list of job positions in the food and beverage manufacturing sector to 19 key ones. Of these 19 positions, the AIR team asked respondents to indicate up to six positions that they consider the largest in terms of recruitment volume for their establishment.[12] In the following section, we delineate the pilot survey results for these job positions, specifically reporting on those most frequently cited across the surveyed establishments.

12. While establishments were able to select up to six positions for the pilot survey, some reported as few as one job. The 19 key positions on the list were processing operators; machine operators; hand packers; cleaners and assistants; accountants; packaging, bottling and labeling machine operators; vehicle drivers and mobile heavy equipment operators; commercial agents and brokers; food and beverage tasters and classifiers; transport and storage workers; clerks; customer information services employees; employees in charge of the registration of materials and transportation; manufacturing industry supervisors; occupational, environmental and related health inspectors; mechanics and machine repairers; administrative and commercial directors; production and operations directors; and chemical engineers (i.e., food and beverage technologists). Respondents could also select "other" to specify job positions that were not in the aforementioned list.

Most Common Positions

Exhibit 7 displays the job positions with the highest recruitment volume, showing the percent of surveyed establishments that identified those positions among their most highly recruited as well as the number of employees for each respective position. Most establishments (80 percent) reported production operators (Appendix E.VI) as a highly recruited position, reporting a total of 5,015 employees (Appendix E.VII) for this position. Following this position, the most frequently cited positions across surveyed establishments were sales positions[13] (35 percent), machine operators (28 percent), and hand packers (15 percent). By position, these establishments employ a total of 1,163 as sales workers; 1,345 as machine operators; and 736 as hand packers.

Exhibit 7. Highly Recruited Job Positions among Surveyed Establishments and Number of Employees



Note. The total number of employees by job position solely represents the establishments that identified the position among their top six most highly recruited. By job position, the total number of observations: production operators (85), sales workers (37), machine operators (30), and hand packers (16).

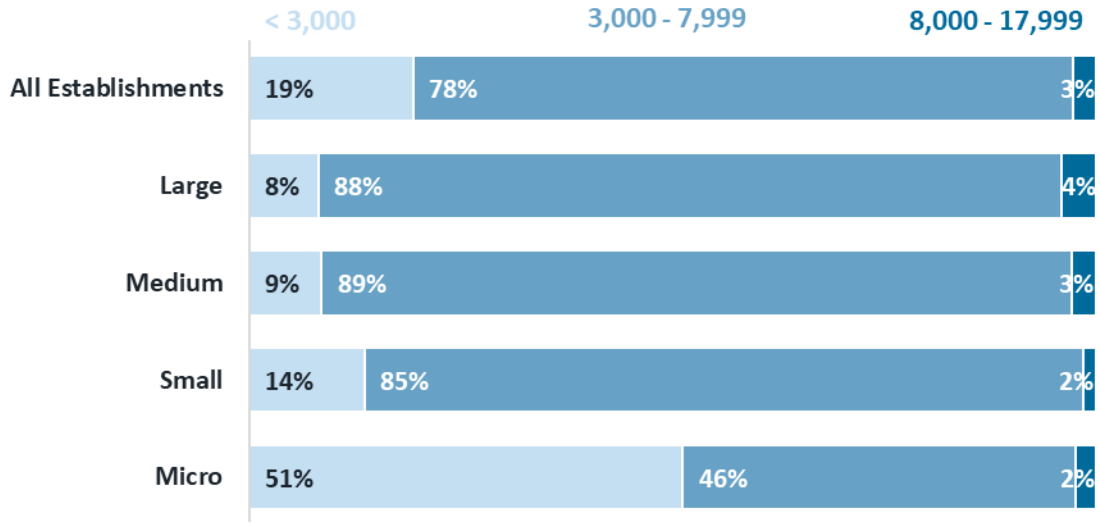
Food and Beverage Sector Remuneration

Among their most highly recruited job positions, survey respondents reported average monthly remuneration rates[14] for each respective position (Exhibit 8).[15] The monthly remuneration rate range that surveyed establishments most frequently reported was between 3,000 and 7,999 Quetzales (GTQ) per month across all jobs. For their most highly recruited job positions, over three quarters of large, medium, and small establishments (88, 89, and 85 percent, respectively) offer an average monthly salary in that range while just under half (46 percent) of micro establishments reported doing so.

13. The sales position is shorthand for commercial agents and brokers. We use this shorthand within the report for illustrative purposes.
14. The remuneration rates reflect base salary, overtime, benefits, in-kind remuneration, and other types of remuneration. The average monthly earnings in Guatemala in 2019 was 2,751 GTQ (ILOSTAT, 2019). In the ISIC-Rev.4: C. Manufacturing sector, the average 2019 salary was 2,994 GTQ (ILOSTAT Explorer, 2019). The gross national income per capita (Atlas method) for Guatemala in 2019 was 35,459 GTQ, which equates to an average of 2,955 GTQ per month (World Bank Data).
15. The third (8,000 to 12,999 GTQ) and fourth (13,000 to 17,999 GTQ) salary range options were combined into one category due to low frequencies. However, only small establishments reported offering a salary range greater than 12,999 GTQ, and no small establishments reported offering a salary range between 8,000 and 12,999 GTQ. The fifth salary range choice (equal to or greater than 18,999 GTQ) is not shown in the exhibit as no surveyed establishments reported offering a salary within that range for any of their most highly recruited job positions.

In general, the distribution suggests that as establishment size increases, so does the average monthly salary they offer for these highly recruited positions.[16] However, there is a notable jump between micro establishments and small establishments. More than half of micro establishments (51 percent) offer an average monthly salary less than 3,000 GTQ, whereas only 14 percent of small establishments offer a salary in that range.

Exhibit 8. Monthly Salary Range (in GTQ), by Establishment Size

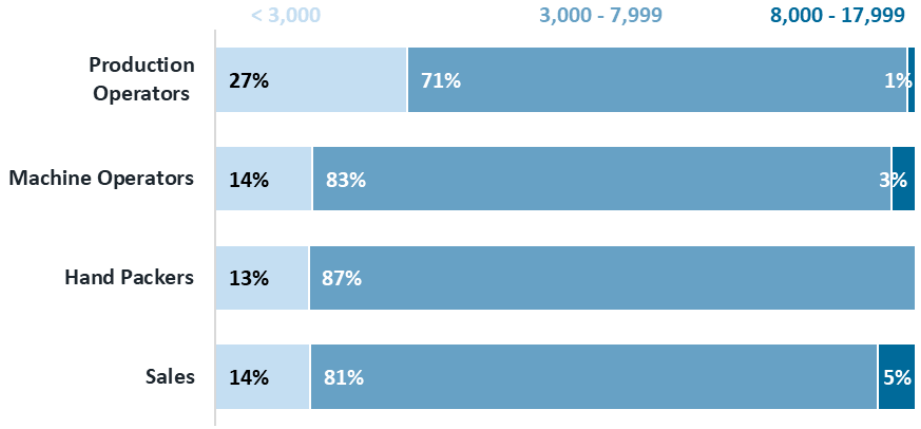


Note. The values reflect all job positions reported as most numerous by establishments (n = 191), which varies by establishment. Responses to the question about salary ranges depends on the positions that each establishment chose as one of the six most numerous. One survey respondent that partially completed the survey did not provide information on salary ranges for three job positions; therefore, this exhibit represents results for 191 of the 194 job positions that establishments reported as most numerous.

By job position, production operators are paid less on average than the other three highly recruited occupations: most establishments[17] (27 percent) reported paying production operators less than 3,000 GTQ per month (Exhibit 9).[18] Conversely, roughly the same percentage of establishments reported paying machine operators, hand packers, and sales workers a salary below that threshold (i.e., 3,000 GTQ); rather, they predominantly (more than 80 percent for each of the three positions) pay between 3,000 and 7,999 GTQ a month. None of the surveyed establishments reported paying hand packers a salary greater than 7,999 GTQ. For an estimation of average salary by job position, please refer to Appendix D.

16. The results in Exhibit 8 capture salaries for the most highly recruited job positions across surveyed establishments. As previously mentioned, respondents were able to indicate up to six positions, and the job positions they identified as highly recruited varied. Therefore, the results in Exhibit 8 do not solely reflect the top four positions across all surveyed establishments (i.e., production operators, sales, machine operators, and hand packers).
17. As previously stated, only establishments that reported these jobs among their most highly recruited provided this job-specific information on remuneration rate ranges. For example, 37 establishments provided this information for sales workers.
18. For the four most highly recruited positions, no surveyed establishments reported offering a salary range above 12,999. The results in the combined salary range (8,000 to 17,999) for Exhibit 9 only reflect the percentage of establishments offering a range between 8,000 and 12,000 GTQ.

Exhibit 9. Monthly Salary Range (in GTQ), by Job Position

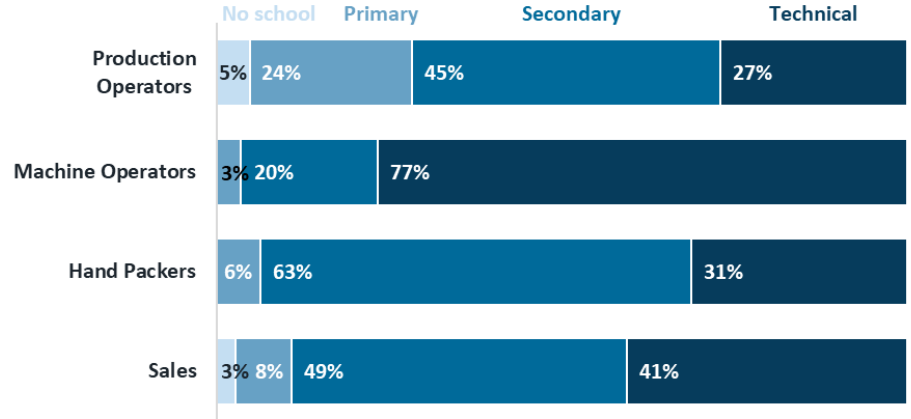


Note. The percentage of monthly salary range by job position solely represents the establishments that identified the position among their top six most highly recruited. By job position, the total number of observations (denominator): production operators (84), sales workers (37), machine operators (29), and hand packers (15). One survey respondent that partially completed the survey did not provide information on salary ranges for three job positions, namely production operators, machine operators, and hand packers.

Academic Training, Competencies, and other Requirements

Minimum education requirements are generally high across all positions. According to survey respondents, machine operators have noticeably higher minimum education requirements than production operators and hand packers (Exhibit 10). Seventy-seven percent of surveyed establishments require technical education for machine operators. For hand packers and production operators, most establishments (63, 45 percent, respectively) require a minimum of secondary education. All surveyed establishments require some education for machine operators and hand packers, and less than six percent reported they do not require any schooling for both production operators and sales workers. No surveyed establishments require a minimum of university education for any of the four job positions.

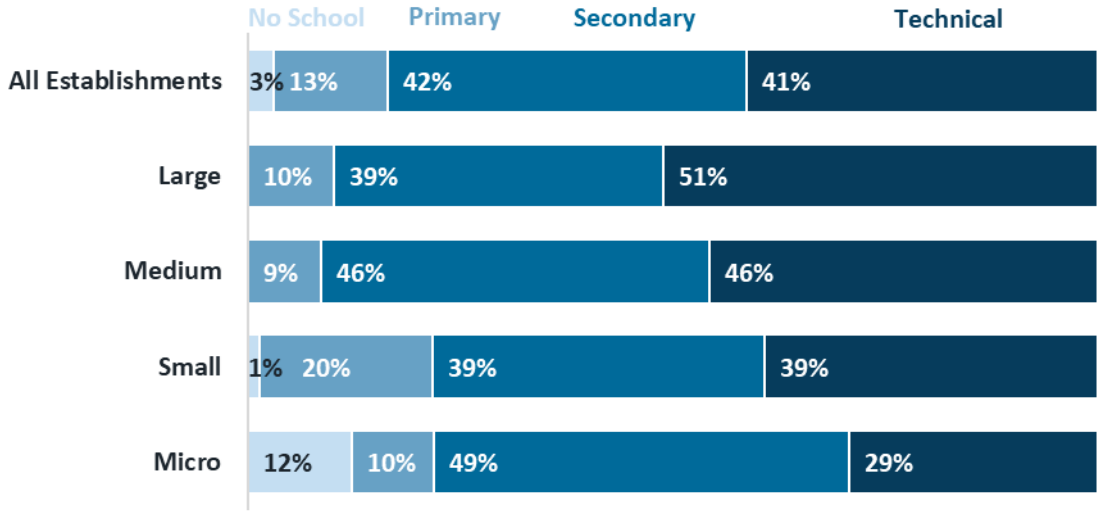
Exhibit 10. Minimum Required Academic Training, by Job Position



Note 1. The category technical refers to technical and vocational training and technical university education.
Note 2. The percentage of minimum required academic training by job position solely represents the establishments that identified the position among their top six most highly recruited. By job position, the total number of observations: production operators (85), sales workers (37), machine operators (30), and hand packers (16).

By establishment size, over half of large establishments (51 percent) require a minimum of technical education, and nearly half of micro establishments (49 percent) require a minimum of secondary education for their most highly recruited positions (Exhibit 11).[19] In general, as establishment size increases, so do the minimum education requirements. In particular, the requirement for post-secondary education increases the larger the establishment.

Exhibit 11. Minimum Required Academic Training, by Establishment Size



Note 1. The category technical refers to technical and vocational training and technical university education.

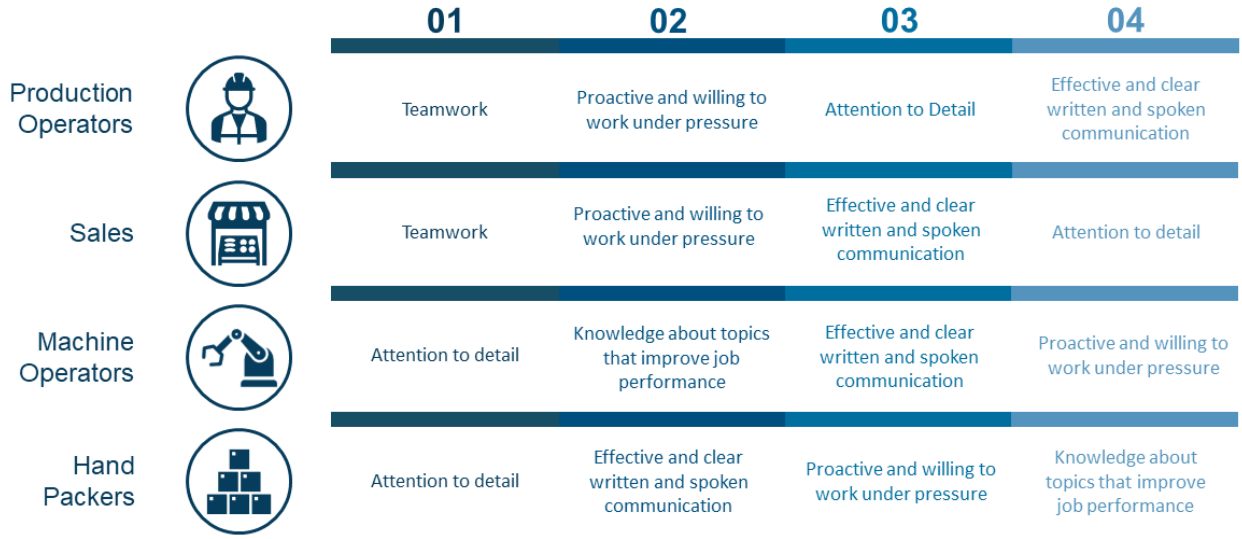
Note 2. The values reflect all job positions reported as most numerous by establishments (n = 194), which varies by establishment. Responses to the question about minimum required academic training depend on the positions that each establishment chose as one of the six most numerous.

AIR asked respondents to identify the most important skills for their most highly recruited job positions.[20] For production operators and sales workers, *teamwork* and *being proactive and willing to work under pressure* were the two most reported skills. For both machine operators and hand packers, *attention to detail* was the most reported skill, as well as *knowledge about topics that improve job performance* for machine operators. Another important skill for these four positions was *effective and clear written and spoken communication* (Exhibit 12).

19. Values reflect positions other than the four positions that establishments most frequently cited (i.e., production operators, machine operators, hand packers, and sales workers), as establishments had the option to list up to six job positions among their most numerous in terms of recruitment volume.

20. Establishments had the option to select up to five required skills per job position that they identified as most numerous. The survey listed 11 key job skills: (1) knowledge about topics that improve job performance, (2) effective and clear written and spoken communication, (3) knowledge and information dissemination abilities, (4) proactive and willingness to work under pressure, (5) innovation abilities, (6) leadership abilities, (7) time management, (8) capacity to generate solutions and offer good service to customers, (9) attention to detail, (10) teamwork, and (11) management in times of crisis. Respondents could also report other skills that were not in this list.

Exhibit 12. Required Skills in Order of Importance, by Job Position



Note. For production operators, *teamwork* and *being proactive and willing to work under* pressure were tied as the top two required skills listed by surveyed establishments. For machine operators, *attention to detail* and *knowledge about topics that improve job performance* were tied as the most important required skill, *and effective and clear written and spoken communication* and *proactive and willing to work under pressure* were tied as the third most important required skill.

For each of their most highly recruited job positions, establishments reported job requirements by order of importance (Exhibit 13). The most important requirement surveyed establishments reported varied among the four most common job positions.[21] *Having a health certificate* was listed as the most important requirement for production operators, *basic machine handling* was most important for machine operators, *living in the area* was most important for hand packers, and *lack of criminal and police records* was the most important requirement listed for sales workers. For hand packers, establishments reported *ability to work overtime*, *have a health certificate,* and *availability of schedule* equally as the second most important requirement. Likewise, establishments reported *have a health certificate* and *letters of recommendation* equally as the second most important requirement for sales workers. Establishments only listed *basic machine handling* and *ability to use specialized tools* as important requirements for machine operators.

21. Establishments had the option to select up to five job requirements per job position that they identified as most numerous. The 14 key job requirements listed in the survey included (1) live in the area, (2) ability to work overtime, (3) basic machinery handling skills, (4) have a health certificate, (5) ability to use specialized tools, (6) job-related certifications, (7) letters of recommendation, (8) membership in a professional association, (9) availability of schedule, (10) ability to work on repetitive tasks, (11) possession of a driver's license, (12) lack of criminal and police records, (13) product knowledge, and (14) knowledge of safety in food production. Respondents also had the option to report other requirements.

Exhibit 13. Job Requirements in Order of Importance, by Position

Note. For production operators, surveyed establishments listed both *letters of recommendation* and *lack of criminal and police records* as the third most important job requirement. For sales workers, *having a health certificate* and *letters of recommendation* were tied as the second most important job requirement. For hand packers, three job requirements were tied as the second most important job requirement: *ability to work overtime, have a health certificate,* and *availability of schedule*.

Personnel Training

The following section describes trends in personnel training among surveyed establishments, including trainings they conducted within the past 12 months as well as future needs for training.

Trainings Provided, Training Plan and Training Budget

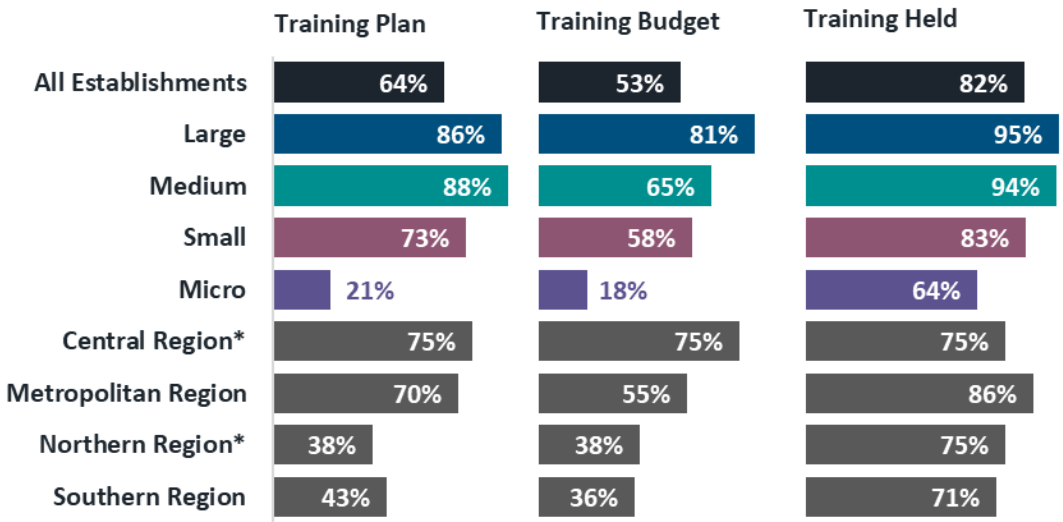
Most surveyed establishments have a training plan for their personnel (64 percent) and held trainings for their personnel in the past 12 months (82 percent); however, only 53 percent reportedly have a budget for personnel training (Exhibit 14). Among surveyed establishments, a vast majority of large, medium, and small establishments (86, 88, 73 percent, respectively) have a training plan, which compares high to micro establishments (21 percent). Likewise, most large, medium, and small establishments have a training budget (81, 65, and 58 percent, respectively) while fewer than a quarter of micro establishments do (18 percent).

By region, most surveyed establishments in the Central and Metropolitan Regions have a training plan (75 and 70 percent, respectively), which compares high to those in the Northern and Southern Region. Nevertheless, a greater proportion of surveyed establishments in the Central Region have a training budget (75 percent) than in the Metropolitan Region (55 percent). However, the total number of surveyed establishments in the Central and Northern Region was small (n = 8 each) and results may not reflect an accurate representation within those regions.

Most surveyed establishments (82 percent) conducted trainings for their personnel within the last 12 months. This trend was consistent across establishment sizes and regions, though a larger share of large and medium establishments (95 and 94 percent, respectively) conducted these trainings relative to small (83 percent) and micro (64 percent) establishments.

The establishments that did not conduct any trainings (n = 19) in the past 12 months indicated that they did not do so because they did not prioritize or perceive such trainings as necessary (n = 4) or they cited other reasons such as the COVID-19 pandemic (n = 4) and not having time for training (n = 3).

Exhibit 14. Proportion of Establishments with a Personnel Training Plan, Training Budget, and that Held Personnel Training in the Past 12 Months, by Establishment Size and Region



Note. *The total number of surveyed establishments in the Central and Northern Regions was eight each. Although robust estimates cannot be made with such a limited sample, results from these regions are reported for illustrative purposes and are included in all aggregate results.

Characteristics of the Personnel Trainings

Within the last 12 months, establishments that held trainings (n = 87) most often convened trainings on the following topics:

- Food Handling
- Biosecurity Protocols for COVID-19[22]
- Customer Service
- Professional Development and Human Resources

22. In general, Biosecurity Protocols for COVID-19 training included measures to mitigate the spread of COVID-19, such as use of face masks in public and common areas. Required measures varied by establishment.

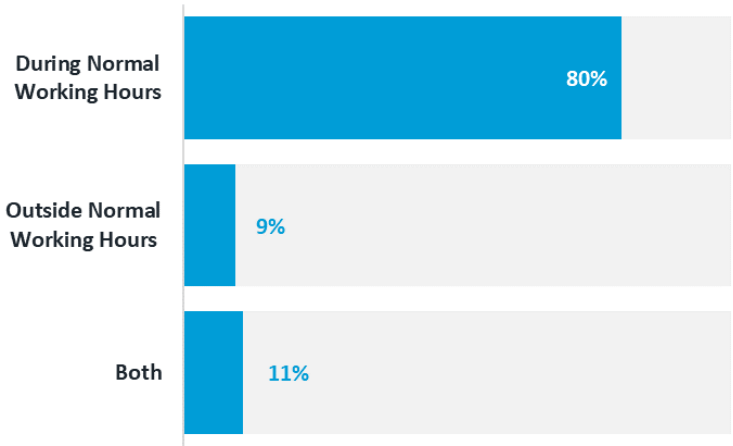
Among those topics, training on biosecurity protocols for COVID-19 reached the largest number of employees on average, followed by professional development and human resources, food handling, and customer service. Additionally, average training duration by topic generally varied between four and eight hours (Exhibit 15). The exception was professional development and human resources (17 hours).

Exhibit 15. Frequency of Training Topics and Average Personnel Trained and Average Hours, by Training Topic

Course Name	Frequency	Average Personnel	Average Hours
Food Handling	56	139	6
Biosecurity Protocols for COVID-19	36	185	4
Customer Service	16	70	8
Professional Development and Human Resources	10	154	17

Of the establishments that held trainings (n = 87), most facilitated them internally; however, a comparatively smaller share had other institutions (e.g., the ministry of public health or local health centers) facilitate these personnel trainings. In addition, most establishments (80 percent) only conducted their personnel trainings during the establishment's standard working hours[23] whereas nine percent only did so outside of normal working hours, and 11 percent conducted trainings both during and outside normal working hours (see Exhibit 16).

Exhibit 16. Training Schedule



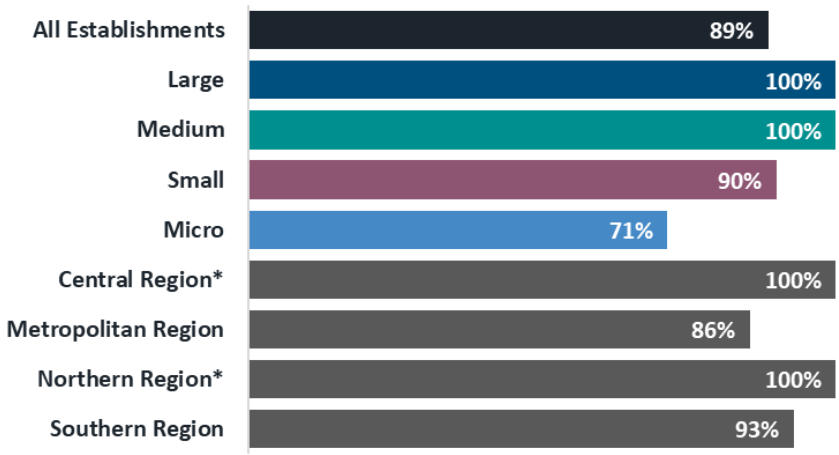
Note. The denominator for all establishments is 204 since it only reflects establishments that held personnel trainings in the past 12 months.

23. Standard working hours may vary from establishment to establishment.

Training Needs

Among surveyed establishments, 89 percent reported having training needs within the 12 months following their survey date. By establishment size, all large and medium establishments (100 percent) reported training needs whereas a comparatively smaller share of small (90 percent) and micro (71 percent) establishments reported as such (see Exhibit 17). By region, 100 percent of establishments in the Central and Northern Region reported training needs, and more establishments in the Southern Region (93 percent) reported training needs than those in the Metropolitan Region (86 percent).

Exhibit 17. Proportion of Establishments with Training Needs, by Size and Region



Note 1. *The total number of surveyed establishments in the Central and Northern Regions was eight each. Although robust estimates cannot be made with such a limited sample, results from these regions are reported for illustrative purposes and are included in all aggregate results.

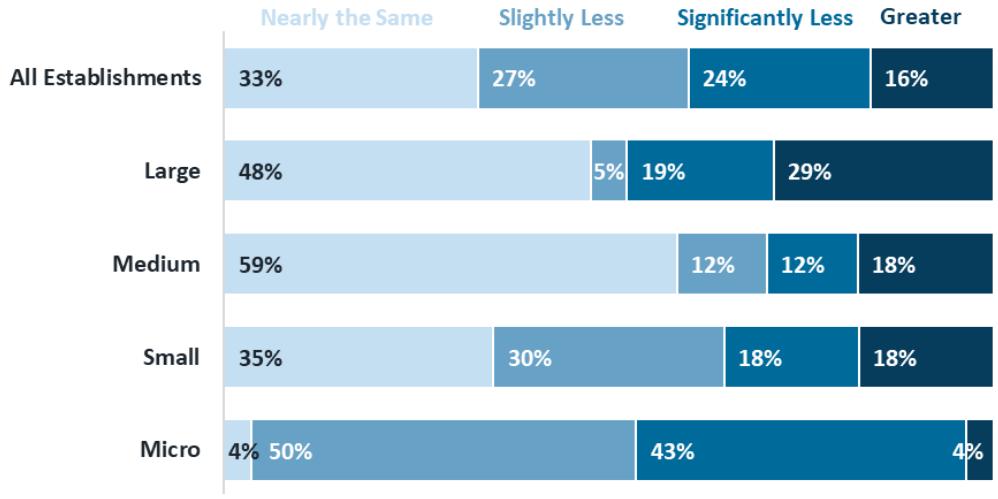
Note 2. Among the establishments with training needs (n = 94), the most frequently mentioned training topics include (1) food handling, (2) biosecurity protocols for COVID-19, and (3) customer service.

The State of the Food and Beverage Sector Amid the COVID-19 Pandemic

Given that data collection for this survey occurred during the COVID-19 pandemic, the results partially reflect pandemic-related changes among the surveyed establishments. Despite the challenges associated with the COVID-19 pandemic, however, all surveyed establishments reported they were open and operational—albeit to varying degrees—when contacted for the survey (Exhibit 18).[24] By establishment size, almost half of large establishments (48 percent) and more than half of medium establishments (59 percent) reported being open with nearly the same capacity. Large establishments (29 percent) reported having greater capacity relative to a pre-pandemic year, and 18 percent of both medium and small establishments reported greater capacity. Most micro establishments reported being open but with slightly less (50 percent) or significantly less capacity (43 percent) relative to a normal year.

24. Surveyed establishments were asked to report whether they were a) currently open, and if so, b) at what capacity relative to a "normal" year (i.e., "before the COVID-19 pandemic").

Exhibit 18. Operational Capacity Relative to a Pre-Pandemic Year, by Establishment Size

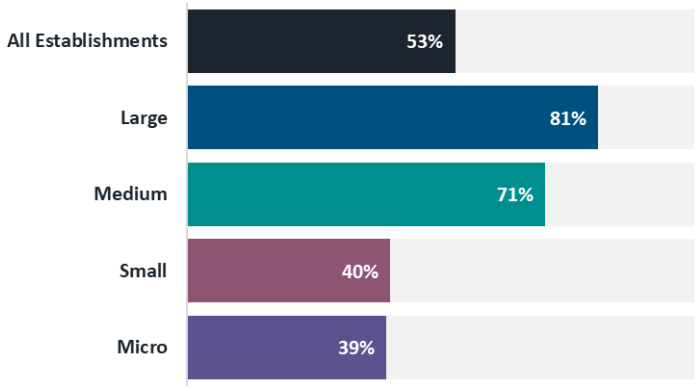


The establishments that were open when surveyed (n = 106) undertook various measures to remain open and reduce their pandemic-related economic losses. With respect to personnel and operational expenses, the most common measures were the reduction of hours and/or employee work schedules (51 percent) and layoffs (24 percent); nevertheless, more than a quarter of these establishments reported that they did not take any measures (29 percent). With respect to production expenses, the most frequent measure was partially reducing production, stocks, or inventories (36 percent). However, 40 percent reported that they did not take any production-related measures to reduce pandemic-related economic losses.

Changes in Personnel Demand

Most surveyed establishments (53 percent) indicated that they would require more staff in the next 12 months (Exhibit 19). When analyzing the projected increase in labor demand by establishment size, 81 percent of large, 71 percent of medium, 40 percent of small, and 39 percent of micro establishments expect increased demand for staff in the following 12 months. By job position, establishments that require additional staff (n = 56) expected greatest demand for production operators (61 percent) and sales positions (34 percent) in the next 12 months.

Exhibit 19. Proportion of Establishments that Project Increased Staff Demand, by Establishment Size



Final Reflections

In this report, we present results from the pilot establishment survey for the food and beverage manufacturing sector in Guatemala, focusing on variation by establishment size with respect to labor demand, personnel dynamics, and training needs. While the pilot survey results do not represent sector trends due to the sample design and size, they underscore the potential insights establishment surveys could yield on labor market dynamics, such as future labor demand, within the food and beverage manufacturing sector.

In our presentation of establishment-level information, two personnel demographic trends stand out: (1) the most representative age group among employees is 21 to 30 years, which accounts for 44 percent of reported workers, and (2) female labor participation accounts for less than half (37 percent) of the reported workforce but varies by establishment size, with micro and large establishments having a higher representation than medium and small establishments.

In addition to these demographic trends among respondents' personnel, it appears that the key job position across respondents is production operators, which greatly outpaced the other highly recruited job positions (i.e., sales workers, machine operators, and hand packers) for their establishments. While production operators are the most highly recruited, they also appear to earn lower monthly remuneration relative to the other three job positions according to pilot survey respondents. Further, minimum education requirements were relatively high among the most highly recruited positions. However, surveyed establishments reported the highest education requirements for machine operators. More than 70 percent of large and medium establishments anticipate needing more staff in the next 12 months, compared to roughly 40 percent for small and micro establishments. Among these establishments, they expect an increase in staff demand for production operators (61 percent) and sales workers (34 percent) in the next 12 months. While machine operators and hand packers were among currently highly recruited positions across establishments, establishments that indicated need for future personnel seldom indicated intent to hire for these positions in the future.

Lastly, while all surveyed establishments reported being open and operational when contacted for the survey, their operational capacity relative to a pre-pandemic year varied between the different establishment sizes. The vast majority of micro establishments reported having less capacity to receive clients compared to a pre-pandemic year whereas the majority of large, medium, and small establishments reported having nearly the same capacity. Additionally, compared to micro establishments, a higher proportion of large, medium, and small establishments reported they had greater capacity to receive clients relative to a normal year.

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World Bank Data. GNI per capita, Atlas method (current (US$) – Guatemala. *World Bank national accounts data, and OECD National Accounts data files*. https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=GT

Appendix A. Establishment List Construction and Response Rate

Since Guatemala does not have an updated, nationally representative registry of establishments in the food and beverage manufacturing sector, AIR compiled a list of potentially eligible establishments for the pilot survey with available data. As noted in the Introduction Section, the AIR team constructed this establishment list with three sources: (1) the Bank of Guatemala's 2013 National Directory of Companies and their Premises (*Directorio Nacional de Empresas y sus Locales*) (DINEL); (2) the compiled business registry of the Guatemalan Chamber of Industry (*Cámara de Industria de Guatemala*) (CIG), the National Competitiveness Program (*Programa Nacional de Competitividad*) (PRONACOM), and the Food and Beverage Union of Guatemala (*Gremial de Alimentos y Bebidas de Guatemala*) (GREMAB); and (3) the Trade Map database of the International Trade Centre (ITC), which we accessed and cleaned in March 2021.

The objective of the pilot survey was to take a census of local registries, offering information regarding their specific target populations. Since CIG was one of AIR's local survey implementing partners in Guatemala, AIR prioritized the compiled CIG-PRONACOM-GREMAB business registry, taking it as the basis for the compiled establishment list. However, due to the limited number of distinct establishments in the CIG-PRONACOM-GREMAB registry that produced goods relevant to the sector of interest (n = 118), AIR sought to augment the establishment list by including the DINEL registry, which had more establishments in the sector of interest (n = 306) but was outdated and lacked contact information for 24 percent these 306 potentially eligible establishments.

Prior to survey data collection activities, AIR attempted to (1) complete the missing contact information for the establishments in the DINEL registry and (2) verify the existence of establishments, using the contact information from the three data sources. For the former, AIR conducted systematic online searches through Google and social media platforms (i.e., Facebook, Instagram, Twitter, LinkedIn) to locate missing establishment contact information, namely a telephone number. Although we were unable to locate this information for under half of these establishments (n = 33), we able to do so for an additional 63 establishments through screening calls, which we conducted prior to fielding the telephone survey.

We conducted initial screening calls with all three data sources prior to survey data collection activities due to concerns regarding outdated and missing information. In these screening calls, we endeavored to verify the existence of each establishment with the available contact information; we also attempted to verify the accuracy of their existing contact information as well as complete missing contact information (e.g., telephone numbers, emails) when applicable. If we were unable to verify the establishment through these initial screening calls, we eliminated them from the establishment list for the survey.

Given the constraints in constructing the compiled establishment list exclusively with the compiled CIG-PRONACOM-GREMAB business registry and the DINEL registry as well as challenges with telephone survey data collection (e.g., non-response, refusals), AIR decided to complement the local registries with the Trade Map database, adding 193 distinct, non-duplicate establishments to the pilot survey establishment list. See Exhibit A1 for the final survey response rates, which we predominantly calculated with formulas from the American Association for Public Opinion Research (AAPOR) *Standard Definitions* (2016). We specify our response rate formulas below.

Exhibit A1. AAPOR Response Rates

AAPOR Response Rates	Survey Screener	Survey Part 1	Survey Part 2	Consolidated
Eligibility Rate (E)	83%	100%	100%	**83%**
Response Rate (RR1)	48%	100%	99%	**48%**
Contact Rate (CONT1)	73%	100%	100%	**73%**
Rejection Rate (REF1)	25%	0%	1%	**25%**
Cooperation Rate (COOP1)	66%	100%	99%	**66%**

AAPOR's **Response Rate RR1** includes Complete Interviews (I) in the numerator. The denominator includes Eligible (Complete Interview [I], Partial Interview [P], Refusal [R], Non-Contact [NC], Other cases of Non-Response [O]) and Unknown Eligibility (Unknown [UH], Other cases of Unknown [UO]) cases. The denominator excludes Not Eligible (NE) cases. The formula for calculating the Response Rate RR1:

$$RR1 = 100 * \frac{I}{(I + P) + (R + NC + O) + (UH + UO)}$$

AAPOR's **Cooperation Rate COOP1** includes Complete Interviews (I) in the numerator and eligible, contacted cases (I, P, R, O) in the denominator. The denominator excludes Not Contacted (NC) cases; Unknown Eligibility (UH, UO) cases; and Not Eligible (NE) cases. The formula for calculating the Cooperation Rate COOP1:

$$COOP1 = 100 * \frac{I}{(I + P) + R + O}$$

AAPOR's **Contact Rate CONT1** includes cases in the numerator where it was possible to contact someone on the phone and invite them to participate in the study. These cases correspond to Complete (I) and Partial (P) Interviews, Rejections (R), and Other Cases of Non-Response (O). The denominator includes Eligible (I, P, R, NC, O) and Unknown Eligibility (UH, UO) cases. The denominator excludes Not Eligible (NE) cases. The formula for calculating the Contact Rate CONT1:

$$CONT1 = 100 * \frac{(I + P) + R + O}{(I + P) + (R + NC + O) + (UH + UO)}$$

AAPOR's **Rejection Rate REF1** includes Rejections (R) in the numerator and Eligible (I, P, R, NC, O) and Unknown Eligibility (UH, UO) cases in the denominator. The denominator excludes Not Eligible (NE) cases. The formula for calculating the Rejection Rate REF1:

$$REF1 = 100 * \frac{R}{(I + P) + (R + NC + O) + (UH + UO)}$$

The AAPOR does not propose a formula to calculate the **Eligibility Rate (E)**[25] for surveys but rather suggests that each study should use the most appropriate formula to estimate the percentage of cases in the sample that could have been eligible for the study. The AAPOR (2016) refers to the manuscript by Smith (2009), which presents and discusses different calculation formulas for eligibility rates as well as the assumptions associated with each of them. For this pilot survey, we used one of the formulas from Smith (2009) to calculate the Eligibility Rate, where the Eligible cases (I, P, R, NC, O) are in the numerator, and the Eligible (I, P, R, NC, O) and the Not Eligible (NE) cases are in the denominator. The denominator excludes Unknown Eligibility (UH, UO) cases. The formula for calculating the Eligibility Rate E:

$$E = 100 * \frac{(I + P) + (R + NC + O)}{(I + P) + (R + NC + O) + (NE)}$$

25. The Anglo-Saxon literature refers to the Out-of-Sample Rate, which is the complement of the Eligibility Rate (E) and is calculated as (100%-E).

Appendix B. Regional Definition

Exhibit B1 below shows the correspondence between the eight official Guatemalan regions, which local partners at the Guatemalan National Institute of Statistics provided, and the consolidated regions we used for illustrative purposes in the Results Section. The exhibit also shows these regions' corresponding departments.

Exhibit B1. Guatemala Regions and Departments

Official Guatemalan Regions	Consolidated Regions	Corresponding Departments
Metropolitan		*Guatemala*
Central		*Chimaltenango, Escuintla, Sacatepéquez*
North	**Northern**	*Baja Verapaz, Alta Verapaz*
North-East		*Chiquimula, El Progreso, Izabal, Zacapa*
North-West		*Quiché, Huehuetenango*
South-East	**Southern**	*Jalapa, Jutiapa, Santa Rosa*
South-West		*Quetzaltenango, Retalhuleu, San Marcos, Sololá, Suchitepéquez, Totonicapán*
Petén*		*Petén*

Note. *We did not include the Petén Region in the analysis as no establishments in this region completed the survey.

Appendix C. Robustness Checks

As previously mentioned in the Introduction Section, we trimmed outliers for demographic data on establishment workers at the upper bound of the 95th percentile for the total number of full- and part-time employees as well as for associated statistics on workers by establishment size (Exhibit 4), gender (Exhibit 5), age range (Exhibit 6), job position (Exhibit 7), and training module (Exhibit 15).

To demonstrate the sensitivity of these aforementioned results by outlier treatment method, we document illustrative robustness checks below.[26] More specifically, we winsorized the demographic data on establishment workers with the 95th percentile of each variable, anchoring our outlier detection for these variables to the total number of full- and part-time employees. This method of outlier detection,[27] which we also implemented for the trimmed mean, is consistent with the survey design insofar as it places an upper-bound constraint on demographic variables for establishment workers. This constraint is conditioned on the total number of full- and part-time employees the respondent reported.

Comparative Statistics: Measures of Central Tendency

In considering the centrality of the total number of full- and part-time employees in our outlier treatment method, we first present several measures of central tendency, namely the median, winsorized mean, and trimmed mean,[28] of this variable (Exhibit C1).

Exhibit C1. Full- and Part-Time Employees, by Measure of Central Tendency and Establishment Size

Measure of Central Tendency	All Establishments	Large	Medium	Small	Micro
Median	35	750	120	30	5
Winsorized Mean	203	844	133	34	5
Trimmed Mean	127	608	133	34	5

In a similar fashion to Exhibit C1, we present three key worker demographic variables by outlier treatment method. These variables are particularly salient in the purview of this report and thus serve as illustrative robustness checks.

26. With a larger sample, we recommend those replicating the establishment survey conduct more intensive robustness checks and consider additional outlier detection and treatment (e.g., imputing the median) methods. Given the limited number of pilot survey respondents, their non-random composition, and the scope of this pilot survey, our sensitivity analysis is purely illustrative.
27. For related practices with firm-level data, please refer to Aguinis et al. (2013) and Ishikawa et al. (2010), among others.
28. The trimmed mean calculations are in the Results Section. We include them in the appendix tables to facilitate comparison between outlier treatment methods.

Exhibit C2. Proportion of Female Employees, by Outlier Treatment Method and Establishment Size

Outlier Treatment Method	All Establishments	Large	Medium	Small	Micro
Winsorized	26%	24%	28%	33%	45%
Trimmed	37%	36%	28%	33%	47%

Exhibit C3. Proportion of Employees, by Age Range (Winsorized) and Establishment Size

	≤ 20	21 - 30	31 - 40	≥ 41
All Establishments	8%	46%	27%	19%
Large	9%	46%	27%	19%
Medium	6%	48%	25%	21%
Small	3%	39%	32%	26%
Micro	3%	30%	39%	29%

Note 1. Among survey respondents, 17 establishments, did not provide information on the number of workers by age range; by establishment size, this encompasses six large, four medium, and seven small establishments. After trimming outliers, this exhibit represents results for 86 of the 106 surveyed establishments.

Note 2. Given the outlier detection and treatment method, six large establishments report influential values for specific age ranges. While these influential values potentially reflect lumpy, multimodal distributions of employees by age range, which may be consistent with ex ante expectations, it also skews the share of workers by age range in this exhibit. Therefore, results for this exhibit are particularly sensitive to the outlier treatment method.

Exhibit C4. Number Employees, by Outlier Treatment Method and Job Position

Outlier Treatment Method	Production Operators	Machine Operators	Hand Packers	Sales Workers
Winsorized	7,096	2,625	1,086	1,749
Trimmed	5,015	1,345	736	1,163

Appendix D. Estimated Average Salary by Job Position

The average salary is an estimate based on the salary ranges the surveyed establishments reported for each of their highly recruited job positions (Exhibit D1). The estimate uses the midpoint of each salary range, rounded to an even number, and defines the lower bound as 1,000 GTQ less than the minimum salary (3,000 GTQ) and the upper bound as 1,000 GTQ greater than the maximum salary (17,999 GTQ). For example, for the 3,000 to 7,999 GTQ salary range, we use 5,500 GTQ as the midpoint.

Exhibit D1. Average Salary (GTQ), by Job Position

	Production Operators	Machine Operators	Hand Packers	Sales Workers
Average Salary (GTQ)	4,738	5,259	5,100	5,365

Note. The number of establishments that reported the average salary for the following positions: production operators (n = 84), machine operators (n = 29), hand packers (n = 15), and sales workers (n = 37).

Appendix E. Definitions

I. Establishment: a part of a business with less decision-making autonomy that depends upon the business for administrative matters.

II. In the context of this report, the term manufacturing alludes to Section C, Manufacturing, of the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4 (2009). This ISIC, Revision 4 section encompasses one of the eligibility criteria for the pilot survey's target population. The term alludes to the distinction between food and beverage *manufacturing* economic activities and other food and beverage economic activities within the ISIC, Revision 4 such as wholesale and retail trade or accommodation and food service activities.

III. This sector corresponds to Division 10 of the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4 (2009). At the four-digit level, this includes the following classes: processing and preserving of meat (1010); processing and preserving of fish, crustaceans and mollusks (1020); processing and preserving of fruit and vegetables (1030); manufacture of vegetable and animal oils and fats (1040); manufacture of dairy products (1050); manufacture of grain mill products (1061); manufacture of starches and starch products (1062); manufacture of bakery products (1071); manufacture of sugar (1072); manufacture of cocoa, chocolate and sugar confectionery (1073); manufacture of macaroni, noodles, couscous and similar farinaceous products (1074); manufacture of prepared meals and dishes (1075); manufacture of other food products not elsewhere classified (1079); and manufacture of prepared animal feeds (1080).

IV. This sector corresponds to Division 11 of the ISIC, Revision 4. At the four-digit level, this includes the following classes: distilling, rectifying and blending of spirits (1101); manufacture of wines (1102); manufacture of malt liquors and malt (1103); and manufacture of soft drinks, production of mineral waters and other bottled waters (1104).

V. The employee ranges for the establishment size categories correspond to the specifications of the Guatemalan Ministry of Economy's Vice Ministry of the Development of Micro, Small, and Medium Enterprises (*Viceministerio de Desarrollo de la Microempresa, Pequeña, y Mediana Empresa*), which we verified with local affiliates from the Food and Beverage Union of Guatemala as well as through a governmental agreement (Ministry of Economy, 2015).

VI. This job position corresponds to the International Standard Classification of Occupations (ISCO) (2008) Minor Group 751, Food Processing and Related Trades Workers apart from Unit Group 7516, Tobacco Preparers and Tobacco Products Makers (ILO, 2012). Other Unit Groups in this Minor Group include butchers, fishmongers and related food preparers (7511); bakers, pastry-cooks and confectionery makers (7512); dairy products makers (7513); fruit, vegetable

and related preservers (7514); and food and beverage tasters and graders (7515). For the Spanish translation of this job position, we used the equivalent term in the Honduran National Occupational Classifier, Revision 2018 (*Clasificador Nacional de Ocupaciones de Honduras, Revisión 2018*) (INE, 2019).

VII. For the pilot survey, respondents reported the number of employees by position based on their high and low seasons of production, if applicable. The survey required that respondents report these two values only if (1) they reported seasonal variation in production volume (81 percent) *and* (2) if they hired more personnel during their high season (29 percent). Otherwise, the survey only required that respondents report one value for their number of employees by position. To aggregate the number of employees by position, we created a single, weighted value among the surveyed establishments that hire more employees during their high season. To construct this weighted average, we used the number of months in each establishments' respective high and low seasons as the weights. In short, the total employees by position within this report represent this weighed average combined with the number of employees by position reported by establishments (1) that did not have a high season or (2) that did not hire more employees during their high season.

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