IPCid
working paper

DOI: http://dx.doi.org/10.38116/ipcid-wp003

IPCid Working Paper **Number 003**
December, 2025

Front-of-pack nutrition labeling in Chile: How micro, small and medium-sized food enterprises respond

Jazmín Muñoz, Marcos Mora and Sofía Boza
Department of Rural Management and Innovation, University of Chile

Israel Klug, Maria Xipsiti, and Ornella Tiboni
Food and Nutrition Division, Food and Agriculture Organization of the United Nations

IPCid ipea Institute for Applied Economic Research

IPCid Working Paper No. 003
Front-of-pack nutrition labeling in Chile: How micro, small and medium-sized food enterprises respond
By Jazmín Muñoz, Marcos Mora, Sofía Boza, Israel Klug, Maria Xipsiti and Ornella Tiboni

Copyright© 2025
Institute for Applied Economic Research (Ipea)

This Working Paper is part of the technical cooperation between the Institute for Applied Economic Research (Ipea) and the Food and Agriculture Organization of the United Nations (FAO), as established in the Memorandum of Understanding signed on 14 December 2023. This partnership aims to foster knowledge exchange and policy advice on social protection systems in rural areas, social protection for fishers and natural resources management, and food security in nutrition.

The text and data in this publication may be reproduced as long as the source is cited. Reproductions for commercial purposes are forbidden.

The International Policy Centre for Inclusive Development (IPCid) is a pillar for the internationalisation of public policy within the Brazilian public sector. The Centre promotes knowledge sharing on public policies between Brazil and its partners, while strengthening South-South cooperation and mutual learning in the Global South.

The IPCid disseminates the findings of its work in progress to encourage the exchange of ideas about development issues. The papers are signed by the authors and should be cited accordingly. The findings, interpretations and conclusions expressed therein are those of the authors and do not necessarily reflect the views or policies of the Centre, the Government of Brazil or the institutions with which the authors are affiliated.

This publication is available online at www.ipea.gov.br. For further information on IPCid publications, please feel free to contact ipcid@ipea.gov.br.

Suggested citation: Muñoz, J., M. Mora, S. Boza, I. Klug, M. Xipsiti, and O. Tiboni. 2025. *Front-of-pack nutrition labeling in Chile: How micro, small and medium-sized food enterprises respond.* IPCid Working Paper, No. 3. Brasília: International Policy Centre for Inclusive Development.

DOI: http://dx.doi.org/10.38116/ipcid-wp003

SUMMARY

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

ACHIPIA: *Agencia Chilena para la Inocuidad y Calidad Alimentaria* (Chilean Agency for Food Safety and Quality)

APL: *Acuerdos de Producción Limpia* (Clean Production Agreements)

CARS: *Comisiones Asesoras Regionales en Inocuidad y Calidad Alimentaria* (Regional Advisory Commissions in Food Safety and Quality)

CECTA-USACH: *Centro de Estudios en Ciencia y Tecnología de los Alimentos de la Universidad de Santiago* (Center of Science and Food Technology Studies of the University of Santiago)

CLP: *Peso Chileno* (Chilean Peso)

CORFO: *Corporación de Fomento de la Producción* (Chilean Economic Development Agency)

DFL: *Decreto con Fuerza de Ley* (Decree with Force of Law)

DIPOL: *División de Políticas Públicas* (Division of Public Policies)

FDA: U.S. Food and Drug Administration

FIA: *Fundación para la Innovación Agraria* (Foundation for Agricultural Innovation)

FOP: Front-of-Package

FOPNL: Front-of-Pack Nutrition Labeling

FOSIS: *Fondo de Solidaridad e Inversión Social* (Solidarity and Social Investment Fund)

GMP: Good Manufacturing Practices

INDAP: *Instituto de Desarrollo Agropecuario* (Institute for Agricultural and Livestock Development)

INE: *Instituto Nacional de Estadísticas* (National Statistics Institute)

INIA: *Instituto de Investigaciones Agropecuarias* (Institute of Agricultural and Livestock Research)

JUNAEB: *Junta Nacional de Auxilio Escolar y Becas* (National Board of Student Aid and Scholarships)

MIDESO: *Ministerio de Desarrollo Social y Familia* (Ministry of Social Development and Family)

MINECON: *Ministerio de Economía, Fomento y Turismo* (Ministry of Economy, Development, and Tourism)

MINSAL: *Ministerio de Salud* (Ministry of Health)

MSMEs: Micro, Small, and Medium-sized Enterprises

PAHO: Pan American Health Organization

PDI: *Programa de Desarrollo de Inversiones* (Investments Development Program)

PRODESAL: *Programa de Desarrollo Local* (Local Development Program)

PTI: *Programas Territoriales Integrados* (Horticultural Integrated Territorial Programs)

RSA: *Reglamento Sanitario de los Alimentos* (Sanitary Regulation of Foods)

SENCE: *Servicio Nacional de Capacitación y Empleo* (National Training and Employment Service)

SERCOTEC: *Servicio de Cooperación Técnica* (Technical Cooperation Service)

SEREMI: *Secretaría Regional Ministerial* (Regional Ministerial Secretariat)

SII: *Servicio de Impuestos Internos* (Internal Revenue Service)

UF: *Unidad de Fomento* (Inflation-indexed unit of account)

UNICEF: United Nations Children's Fund

USDA: United States Department of Agriculture

1 ABSTRACT

This working paper examines the responses of Micro, Small, and Medium-sized Enterprises (MSMEs) to the implementation of Law 20.606 in Chile, focusing on the mandatory Front-of-Pack Nutrition Labeling (FOPNL). While the impact of FOPNL on large industries and consumer behavior is increasingly documented, the specific challenges and actions of smaller enterprises remain under-researched. Utilizing a descriptive approach, this case study analyses distinct food processing companies to identify the factors that foster or limit their compliance and engagement with this new regulation. The findings reveal that MSMEs responses are shaped by a complex interplay of internal capabilities, access to financial and technical support, market and value chain dynamics, consumer preferences, product characteristics, and processing options. While public support has been concentrated in awareness campaigns and labeling training, the study reveals broader implications. It highlights gaps in public support measures regarding finance, technical services, product development and reformulations, food composition tables, standardized and sanitary-certified food processing, and formal business development. The paper concludes with a conceptual model and policy implications, aiming to inform further studies and strengthen institutional frameworks to improve the sustainability and competitiveness of MSMEs navigating food labelling regulations.

Keywords: Front-of-pack nutrition labeling (FOPNL); MSMEs; Food processing; Public policy support; Chile.

2 INTRODUCTION

Front-of-pack nutrition labeling (FOPNL) is a form of supplementary nutrition information that presents simplified information on the front-of-pack of pre-packaged foods. It can include symbols/graphics, text or a combination thereof that provide information on the overall nutritional value of the food and/or on nutrients included in the FOPNL. The Codex Alimentarius has recently adopted international guidelines on front-of-pack nutrition labeling.[1]

This study explores how smaller-sized food processing enterprises respond to front-of-pack nutrition labeling (FOPNL) regulations in Chile, a relatively under-researched area. Most existing studies have primarily focused on large companies due to their significant market share and the intended broader impact of FOPNL on food environments (Corvalán et al., 2021). Previous studies also describe the policy process, the geographical distribution of FOPNL regulations in the Latin America and Caribbean region, the main institutions involved, and the type of labels adopted (FAO, PAHO & UNICEF, 2023; Crosbie et al., 2023). However, the challenges faced by smaller enterprises in responding to these regulations have not been sufficiently addressed. This is an important topic, not least because governments commonly recognize the significant role of these smaller-sized enterprises in job creation, innovation, growth, and food security and have introduced supportive policies for them. However, there is limited understanding of how such support can be tailored to help these enterprises navigate FOPNL regulations.

1. See: https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXG%2B2-1985%252FCXG_002e.pdf.

The study aims to contribute to filling this gap by investigating how smaller-sized food processing enterprises handle FOPNL in a comprehensive manner, identifying factors that facilitate or hinder their efforts, and providing insights for policies and institutions. This report will pinpoint areas of support and policy and institutional frameworks that could enhance smaller enterprises' responses to FOPNL in Chile. Additionally, it will describe the economic significance of the Chilean food processing micro, small, and medium-sized enterprise (MSME) subsector, the distribution of company sizes, and the main food categories and processing activities. The goal is to create a conceptual model, supporting future studies and policies for these enterprises concerning FOPNL.

This report comprises seven main sections, starting with a background on Chilean Law 20606 about the Nutritional Composition of Foods and Advertisements, which describes the objectives of this regulation, and its third phase of implementation focused on MSMEs. The background section also presents the typology of smaller-sized enterprises and main economic indicators. A description of the study methodology follows. In sequence, a review of the MSME food processing in Chile is provided; it includes a description of the economic data, such as the number of companies, sales volume, and the number and distribution of workers by gender. In addition, the main food processing activities within the MSMEs are detailed. Afterwards, the report describes the policy framework, listing policies, public institutions and main programs that support MSMEs. Additionally, the report describes initiatives to enhance compliance of smaller-sized food processing enterprises with FOPNL. The following sections are on the case studies presenting primary data on how micro and small enterprises respond to FOPNL, followed by a discussion triangulating the main findings presented in all previous sections. The final section will consider the main contributions of this study to policies and future research.

3 BACKGROUND

Law 20606 on Nutritional Composition of Foods and Advertisement, commonly referred to in Chile as the "Labeling Law", is a piece of legislation introduced in 2007 by the Senate Health Committee. It was designed to regulate the commercialization of foods that are highly energy-dense or with a high content of sugar, salt, and saturated fats emphasizing the importance of transparently and consistently informing consumers. After years of deliberation, Law 20606 was approved in 2012, but it was not until June 2015 that it was implemented through the Decree No. 13 of the Sanitary Regulation of Foods (RSA), gradually coming into effect one year later (FAO and PAHO, 2017).

The law was introduced as a response to the high prevalence of obesity in Chile. The rationale is that providing detailed, easy-to-read information, alongside regulating the commercialization and advertisement of foods, can empower consumers to make healthier food purchasing choices (Boza et al., 2019). Data reveals that more than half of the Chilean children are overweight or obese: 27.3 per cent of school-age children (from elementary to the first year of high school; ages five to fifteen) are overweight and 31 per cent are obese (JUNAEB, 2022)[2]. Additionally, 39.8 per cent of people over fifteen years old are overweight, 31.2 per cent are obese, and 3.2 per cent are morbidly obese (MINSAL, 2017).

2. Figures from Informe Mapa Nutricional, which does not retrieve data from private schools.

Although Law 20606 is mainly known by the "High in" labels, its application is focused on the production, distribution, merchandising, and consumption of foods, with three main scopes. The first one is the mandatory front-of-package nutrition labeling for processed foods containing higher than threshold levels of energy, saturated fats, sugar, and sodium. This choice was based on the risk these nutrients may pose to human health when consumed in excess.

The second scope of the law is the ban on advertising targeted at children under 14 years old of foods containing at least one "High in" label. Finally, the law includes a component on education and promotion of healthier lifestyles, which includes the prohibition of the sale in schools of foods that are highly energy-dense and with a high content of sugar, salt, and saturated fats, as established in the law.

The law gained broad acceptance among the population (DIPOL, 2017, 2018; Corvalán et al., 2021), influenced consumer purchasing decisions (Crovetto et al., 2020; Barahona et al., 2020), food product development (e.g. reformulation) and marketing strategies of larger companies (Corvalán et al., 2021). In addition, in aggregate terms, it was not shown to have impacted jobs, wages and output of the food production subsector (Corvalán et al., 2021).

The label consists of an octagon, emulating a stop sign, in a black background and white borders, containing the words "High in" plus the nutrient for which the threshold is exceeded, and the words "Ministry of Health," as shown in Figure 1.

FIGURE 1. Warning front-of-package labels (MINSAL, 2016)

Source: MINSAL, 2016.

TABLE 1. Thresholds of targeted nutrients and timeframe of restrictiveness

Nutrient	Classification	Implementation 27 June 2016	24 months from implementation	36 months from implementation
Energy	Solid (kcal/100g)	350	300	275
	Liquid (kcal/100ml)	100	80	70
Sodium	Solid (mg/100g)	800	500	400
	Liquid (mg/100ml)	100	100	100
Sugar	Solid (g/100g)	22.5	15	10
	Liquid (g/100ml)	6	5	5
Saturated fats	Solid (g/100g)	6	5	4
	Liquid (g/100ml)	3	3	3

Source: Authors' elaboration.

The size, design of the stamps, additional technical specifications, and the nutrient density thresholds for energy, sugars, saturated fats, and sodium were determined by MINSAL through a modification to the Decree No. 13 of the Sanitary Regulation of Foods (RSA). This regulation specifies that any food available for sale, including imported food, must have the respective warning labels if the thresholds are exceeded. Thresholds are set based on the density of targeted nutrients expressed in portions of 100 grams for solids and 100 milliliters for liquids and were designed to come into effect progressively, becoming increasingly restrictive over time, as shown in Table 1.

The mandatory implementation of Law 20606 came into effect on June 27, 2016, after a one-year grace period for all enterprises, regardless of their size. Nonetheless, Decree No. 13 granted micro and small-sized enterprises, defined according to Chilean Law 20.416, a further extension of thirty-six months before applying these labeling obligations. Attending to the request[3] of the Ministry of Economy, Development, and Tourism (MINECON) on the exemption of micro-sized food processing businesses from the labeling requirements, an additional extension of thirty-six months for micro-enterprises was granted.[4] Thus, the grace period for small companies ended on June 27, 2019, and the extension for micro-enterprises finalized on June 27, 2022.

Smaller-sized companies, i.e., micro, small, and medium scale enterprises (MSMEs), are regulated under the Chilean Law 20416. It classifies enterprises into three categories based on their annual sales value (Art. 2). However, MSMEs can also be measured by number of workers, according to Decree with Force of Law Number 1 (DFL-1) on the Labor Code (Art. 505 bis.). These classifications are shown in Table 2.

TABLE 2. Categories of smaller-sized enterprises in Chile

Size of the enterprise	Annual net sales (UF*)	Number of workers
Micro	0 – 2,400	1 – 9
Small	>2,400 – 25,000	10 – 49
Medium	>25,000 – 100,000	50 – 199

Note: *UF: The "Unidad de Fomento" (UF) is an inflation-indexed unit of account, calculated and published by the Central Bank of Chile. Its value on December 1, 2022, was CLP $ 34,817.58 (USD 38.91).

Source: Authors' elaboration.

Enterprises selling less than 93,384 dollars per year are micro, less than 972,750 dollars but more than 93,384 dollars are small, and medium-sized enterprises sell less than 3.891 million dollars but more than 972,750 dollars per year (these figures may vary according to the exchange rate with Chilean pesos).

In 2021, MSMEs represented 82 per cent of the total number of food processing companies in Chile and sold $2.4 billion (SII, 2022), which suggests the importance of these enterprises in metrics such as employment. Indeed, 34 per cent of the labor in the food processing subsector works for an MSME. Thus, MSMEs constitute most of the businesses regulated by Law 20606. This study focuses on the recent and evolving responses of smaller-sized food processing entrepreneurs to the front-of-packaging nutrition labeling (FOPNL) in the context of supportive policy measures to MSMEs in Chile.

3. Memorandum (Oficio) Ord. N. 2727, on March 21, 2019, from the Ministry of Economy, Development and Tourism.

4. Decree 20. June 25, 2019. Available at: https://www.bcn.cl/leychile/navegar?idNorma=1133453&idParte=10035504.

4 METHODOLOGY

Guided by Yin (2014), this study employs a descriptive case study approach to document how smaller-sized food processing enterprises navigate front-of-package nutrition labeling regulations (FOPNL). Additionally, it uses an exploratory approach to examine variations in responses among these companies, describe the support available and their access to it, and identify fostering and limiting factors in the responses of selected companies to FOPNL.

The study design facilitates analytical generalization, aiming to gain insights to identify variables and the interplay among these variables relevant for analyzing smaller-sized enterprises' responses to FOPNL nutrition labeling in different contexts (Flyvbjerg, 2006). These insights can inform policy-oriented research aiming at strategies for enhancing smaller-sized companies' response to FOPNL in different contexts. Unlike statistical generalization, which extrapolates results from a sample to a larger population based on probabilities, analytical generalization applies insights from case studies to develop or refine conceptual models (Flyvbjerg, 2006).

The research deliberately selected specific cases of smaller-sized food processing enterprises with varying responses to front-of-package nutrition labeling to maximize the information utility from small samples and single cases (Flyvbjerg, 2006; Yin, 2014).
This selection aimed to provide case-specific, in-depth insights into how different smaller-sized food processing enterprises respond to FOPNL. The selection criteria, established through stakeholder consultation held on 16 November 2021 and involving government, researchers, industry, and supporting institutions, encompassed:

- Companies manufacturing diverse food products for distinct target markets.
- Companies exhibiting varying responses to front-of-package nutrition labeling (FOPNL).
- Companies receiving or not receiving public sector support.
- Companies engaged, and not engaged, in food development initiatives aimed at responding to FOPNL.
- Companies demonstrating higher business capabilities compared to selected peers.
- Companies with enhanced integration into distribution channels relative to selected counterparts.

The criteria to select companies are aligned with scholarly and policy-oriented publications pointing to the critical roles of research and development, public support, supply chain integration, market orientation, and business capabilities and technical knowledge in fostering innovation among smaller enterprises (Davcik et al. 2021; Stanley and John, 1994; Storey, 2022; Michael E, 2018; Prajogo & Olhager, 2012).

The study selected three companies from responses received to ten invitations, encompassing varied responses to front-of-pack nutrition labeling regulations. For instance, these responses include companies reformulating recipes, rebranding, conducting marketing or information campaigns, exploring new distribution channels, and simply complying with labeling requirements. One selected enterprise participated in a food product research and development initiative; two received public sector support; companies presented varying technical and business capabilities, market integration levels and operated across different geographic regions and food products.

Enterprises' data were retrieved following the application of guided interviews conducted between August and September 2022, both face-to-face and through video calls. Interviews followed a semi-structured guide containing open-ended questions related to selected indicators clustered in eight different categories: business and entrepreneurs' characteristics, product characteristics and production processes, strategies adopted to comply with Law 20606, investments and costs associated with adopted strategies, knowledge and usefulness of policy measures, support received, opportunities and constraints of support received, main additional challenges and gaps identified. The study employed qualitative content analysis to classify the transcription of interviews into the eight topics, contrasting the three companies to explore fostering and limiting factors to their responses to front-of-package nutrition labeling regulations. It produced in-depth descriptions documenting how smaller-sized food processing enterprises addressed the challenges and requirements of front-of-package (FOP) nutrition labeling regulation.

The data for characterizing the MSME food processing subsector and existing policies and interventions supportive of smaller-sized enterprises were gathered through a mixed-method approach. This approach included a stakeholder consultation held on 16 November 2021 with key representatives from government, industry, subject matter experts, academia, and institutions supporting MSMEs. The consultation was complemented by a review of policy documents and supporting literature to describe national and sub-national policy measures, institutions, and initiatives supporting MSMEs. The description included stakeholders' and subject matter experts' insights on fostering and limiting factors to MSMEs responses to front-of-package nutrition labeling regulations. Insights were collected during the stakeholder consultation and in follow-up conversations.

Data extraction from the National Internal Revenue Service (2022) was used to describe the relative size of the MSME food processing subsector, for instance, economic data of MSME food processing subsector, number of companies, sales, volume, and number and distribution of workers by gender, the main food categories and processing activities performed and the relative importance within the micro and small food processing subsector. The qualitative analysis based on assessed documents and stakeholders' inputs aimed to pinpoint which supportive policies for smaller-sized food processing businesses factor in specific considerations on their needs to respond to FOPNL. Additionally, it describes and assesses the coverage of initiatives specifically designed to enhance MSMEs responses to front-of-package nutrition labeling and discusses coverage adequacy based on data extracted from the National Internal Revenue Service (2022).

The discussion triangulates findings to identify supportive policies and institutions that have the potential to enhance MSMEs responses to front-of-package nutrition labeling regulations. The potential of these policies and institutions is based on their mandates to address the fostering and limiting factors identified. The study's findings thus outline the key variables and their interplay in shaping these enterprises' responses to FOPNL. It provides a road map to future empirical frameworks aiming to provide an evidence base for developing tailored policies and interventions for enhancing the sustainability and effectiveness of smaller-sized businesses' responses to FOPNL.

The methodology has limitations. While the selection of three companies followed specific criteria, it may not fully capture all of the factors influencing smaller-sized food processing responses to FOPNL. Furthermore, secondary data from the National Internal Revenue Service (2022) offered detailed description of MSMEs food categories and activities, but they didn't

specify how many smaller-sized food processing enterprises produce products subject to FOPNL. This limited the analysis to the assumptions that all smaller-sized food processors can sell products subject to the regulation.

5 MICRO, SMALL, AND MEDIUM-SIZED FOOD PROCESSING IN CHILE: A REVIEW

The classification previously shown in Table 2 applies to all companies in Chile, including those within the food processing subsector. While the food processing subsector is not explicitly defined in the national statistics, it encompasses all economic activities where raw food is transformed into processed products. The Chilean Internal Revenue Service (SII) identifies fourteen distinct economic activities within eight subsectors of the manufacturing industry that fall under the food processing subsector, are regulated by Law 20606, and produce foods that can require "High in" labels. These activities and subsectors are listed in Table 3.

TABLE 3. Economic activities and subsectors within the food processing in 2021

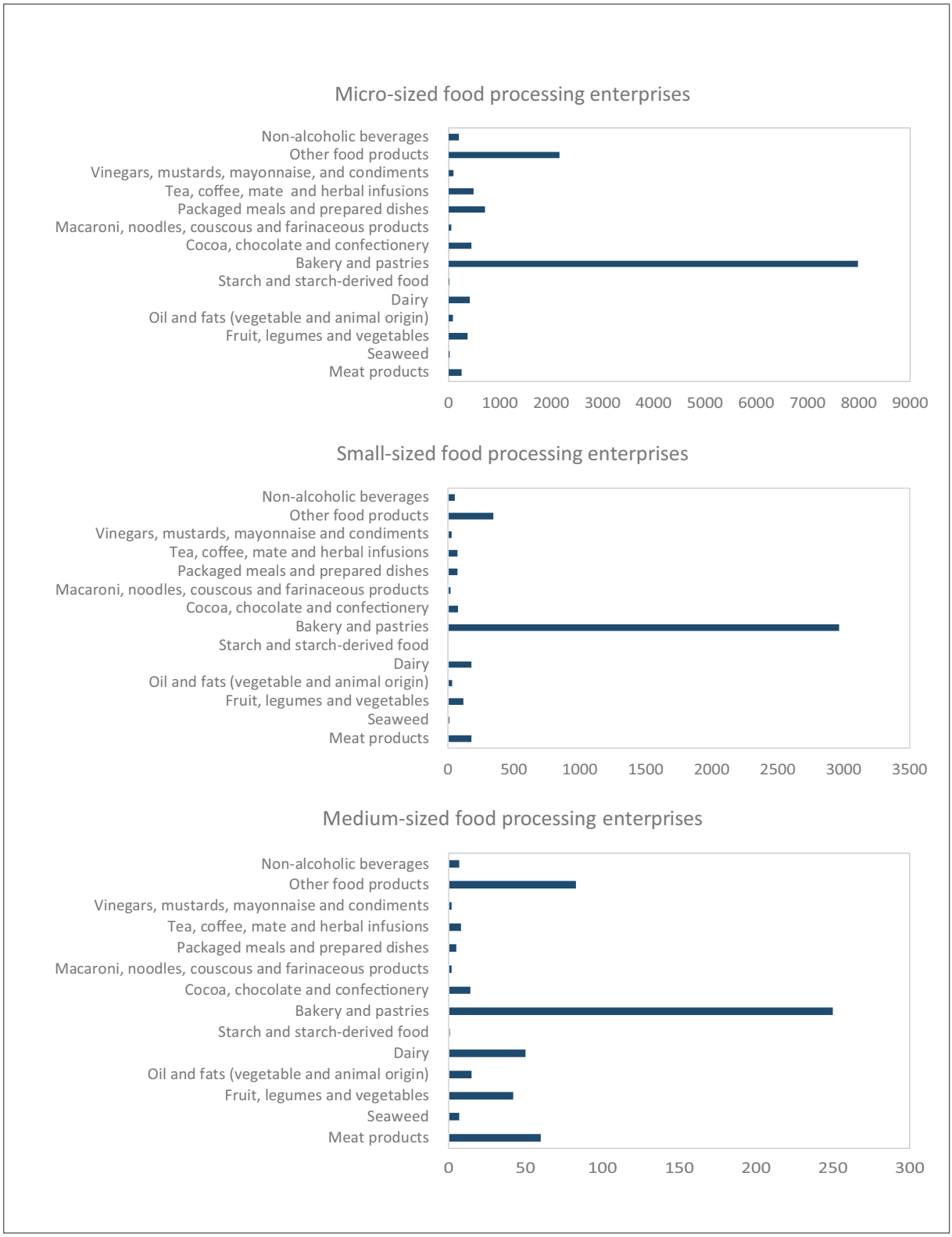
Economic activity	Subsector
Meat and meat products production and conservation	Meat production and conservation
Seaweed production and processing	Fish and seafood production and conservation
Production and conservation of fruit, legumes, and vegetables	Production and conservation of fruit, legumes, and vegetables
Production of oil and fats from vegetable and animal origin (except butter)	Production of oil and fats from vegetable and animal origin
Dairy production	Dairy production
Manufacture of starches and starch-derived products	Manufacture of milling products, starches, and starch-derived products
Manufacture of bakery and pastry products	Manufacture of other food products
Manufacture of cocoa, chocolate, and confectionery products	
Manufacture of macaroni, noodles, couscous, and similar farinaceous products	
Preparation of packaged meals and prepared dishes, labeled and with nutritional information	
Preparation of tea, coffee, mate, and herbal infusions	
Preparation of vinegars, mustards, mayonnaise, and condiments in general	
Manufacture of other food products (not previously classified)	
Production of non-alcoholic beverages	Production of alcoholic and non-alcoholic beverages

Source: Authors' elaboration with data from SII, 2022.

Table 3 represents a wide range of processed food products across Chile. Food processing activities vary greatly, shaped by the country's diverse climates and agricultural and livestock production systems. For instance, in the north, producers turn olives into oil and spreads, while goat farmers make cheese. The temperate central regions focus on preserving fruits, legumes, and vegetables, with many producing jams and preserves. In the south, dairy and meat processing dominate, while coastal areas emphasize seafood, though most are sold raw

and not subject to Law 20606. Thus, the subsector classification adopted by national statistics encompasses a broad scope of products.

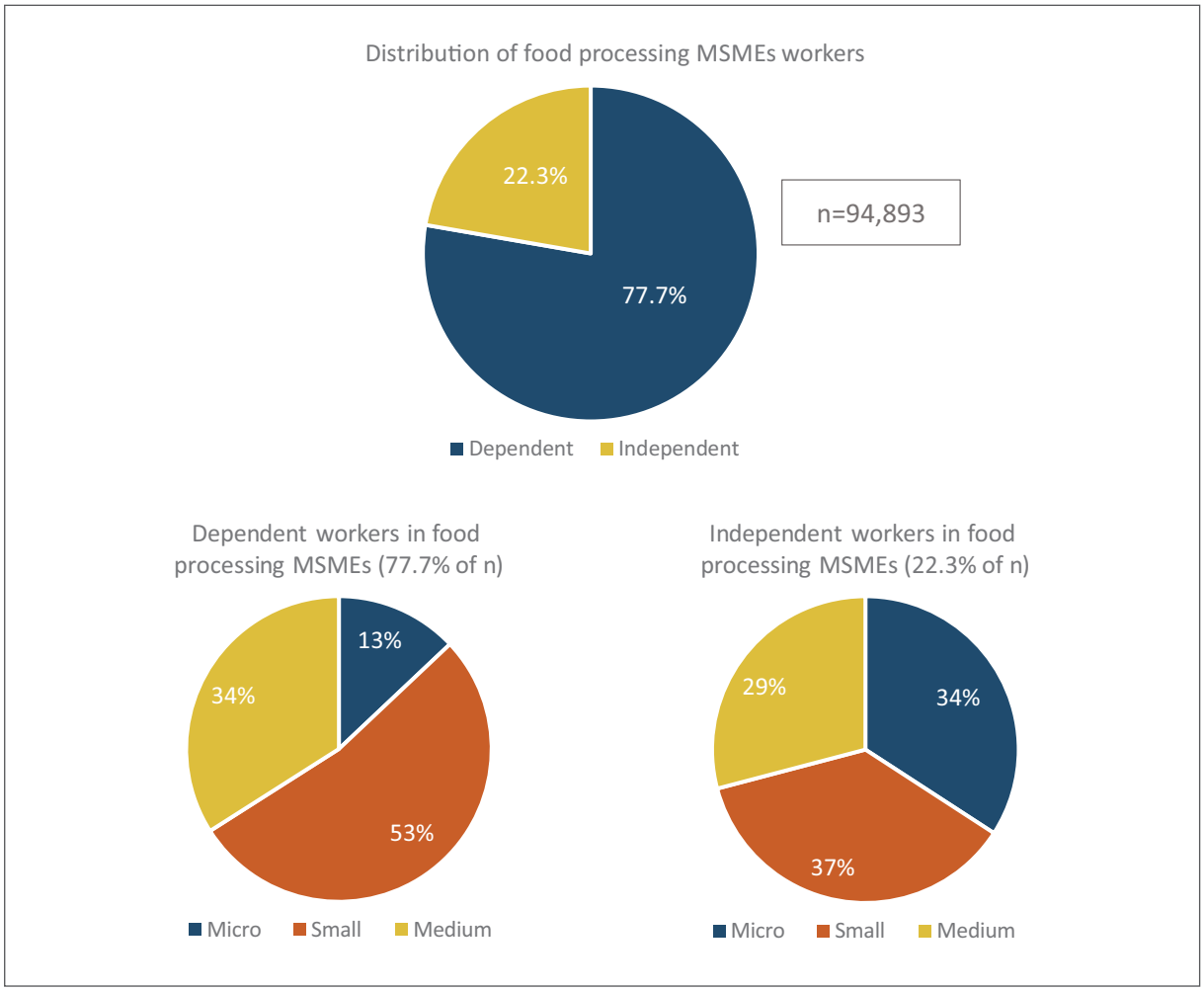
FIGURE 2. Number of food processing MSMEs by economic activity



Source: Authors' elaboration with information from SII, 2022.

According to the SII (2022), in 2021, there were 21,879 food processing companies registered and fiscally formalized in Chile. Of them, 60.6 per cent were micro-enterprises (n=13,258), 18.9 per cent were small enterprises (n=4,144), and 2.5 per cent were medium enterprises (n=546).[5] The whole segment reported a total sales income of $27.7 billion,[6] with micro-enterprises reporting sales for $273.3 million, small enterprises $1.2 billion, and medium enterprises for $927.8 million. This means that even though smaller-sized food processing enterprises represent the greatest percentage in number of food processing companies, they only account for 8.6 per cent of the total sales revenue. In detail, micro-enterprises account for 1.0 per cent of the total sales revenue of the food processing businesses, and small and medium-sized enterprises account for 4.3 per cent and 3.3 per cent, respectively. On average a single micro-enterprise sells $20,611, a small enterprise sells $286,973, and a medium enterprise sells $1,699,332 in a year, revealing the significant disparity between the three categories of smaller-sized companies.

FIGURE 3. Characterization of food processing MSMEs' workers



Source: Authors' elaboration with information from SII, 2022.

5. There were 302 large companies registered in 2021, accounting for the 91.4 per cent of the sales income of the year. There were also 3,629 enterprises that did not report sales in 2021.

6. Data in the SII is expressed in UF but was converted to US dollars using the exchange rate from December 1, 2022 (hereinafter all UF figures will be expressed in USD from December 1, 2022).

The most common economic activity of Chilean food processing MSMEs is the manufacture of bakery and pastry products (see Figure 2). This activity is carried out by 60.2 per cent of micro-sized enterprises, 71.5 per cent of small enterprises, and 45.8 per cent of medium-sized enterprises. The data are consistent with the proportion of sales income of the activity over the entire food processing subsector: 68.2 per cent, 72.0 per cent, and 44.2 per cent, in micro, small, and medium-sized enterprises, respectively. The preparation of packaged meals and prepared dishes, and the preparation of tea, coffee, mate, and herbal infusions are the distant second and third most common activities for micro-enterprises, with 703 and 487 companies, respectively, representing 4.2 per cent and 3.0 per cent of sales income from the food processing subsector.

Larger companies tend to focus more on high-value foods such as dairy, meat and meat products, and fruit, legumes, and vegetables. For small and medium-sized enterprises (SMEs), the second and third most important activities are "meat and meat products," with 177 small and 60 medium companies, and "dairy," with 176 small and 50 medium-sized enterprises (without considering the category "other food products" in any of the size categories). Small and medium-sized companies within the activity "meat and meat products" account for 5.3 per cent and 12.9 per cent of the sales income of small and medium food processing companies, respectively. Small and medium companies within the activity "dairy" account for 4.5 per cent and 9.9 per cent of small and medium food processing sales income. This is followed by fruit, legumes, and vegetables, where 116 small enterprises produce 3.5 per cent of small food processing companies` income, and 42 medium-sized enterprises produce 9.9 per cent.

The food processing subsector employs 278,946 people, of which 34.0 per cent (n=94,893) work in an MSME. 77.7 per cent of the smaller-sized food processing companies' workers are dependent employees, and the remaining 22.3 per cent are independent contractors or free workers. The workforce in food processing MSMEs represents 2.09 per cent of the labor force in the country, out of all the companies registered in the SII. The details for MSMEs are shown in Figure 3.

As it is shown, in 2021 almost a third of the workforce from the food processing subsector worked for an MSME, which is surprising given that smaller-sized enterprises employ almost half (47 per cent) of the total workers in all sectors. Some authors even suggest a higher percentage, with MSMEs across all industries providing up to 65 per cent of the jobs in Chile (Rodríguez-Auad and Campero, 2020). Specifically, within the food processing subsector, 30.4 per cent of the dependent employees work for a food processing MSME, while 57.9 per cent of the independent contractors in the food processing industry work for a micro, small, or medium-scale company (see Table 4).

TABLE 4. Workers by type, economic (sub)sector, and company size in Chile

Type of worker	Sector or subsector	Company size	Total
Dependent	All sectors	All	9,805,302
		MSME	4,329,525
	Food processing	All	242,463
		MSME	73,759
Independent contractor	All sectors	All	3,524,074
		MSME	1,927,957
	Food processing	All	36,483
		MSME	21,134

Source: Authors' elaboration with data from SII, 2022.

The food processing subsector is an important source of jobs for women. 47.1 per cent of the workers are female, 87.0 per cent of whom are dependent employees, and 13.0 per cent of whom are independent workers. For smaller-sized food processing companies, 50.4 per cent of the labor force is female: 30,417 dependent employees and 9,505 independent contractors. In relative terms, 50.5 per cent of dependent employees and 49.9 per cent of independent contractors in food processing MSMEs are women.

While discussing these figures, it is important to bear in mind that the economic data on food processing MSMEs primarily reflects formal, registered companies. However, there are high levels of informality, especially among micro-sized enterprises. According to SII data from 2021, 21.5 per cent of the companies in the manufacturing sector belong to the food processing subsector, employing 27.2 per cent of the manufacturing industry. These numbers are likely much higher when informal operations are considered. MINECON (2020) reports that only 36.1 per cent of manufacturing micro enterprises are formal, while Sáez (2020) estimated that 79.2 per cent of companies in the manufacturing industry operate informally. These informal enterprises are unregistered with the SII, likely lack proper accounting practices, and often cannot separate business income and expenses from those of the household finances.

Although medium and smallholder farmers represent over 90 per cent of agricultural producers in Chile (Berdegué and López, 2018) and are distributed across all 15 regions, food processing companies are likely not commonly owned by smallholders. Research by Boza et al. (2015) found that only 29.5 per cent of participants in Local Development Programs (PRODESAL)[7] engage in food processing, while more recent studies (Boza et al., 2022) show that just 8 per cent of beneficiaries of Horticultural Integrated Territorial Programs (PTI)[8] own a processing plant. Suggesting that most smallholder farmers do not engage in food processing for commercialization. The 2021 Silvo-agricultural and Livestock Census reveals that 55.9 per cent of these farmers own less than 10 hectares, and 30.8 per cent own between 10 and 50 hectares. However, while representing over 90 per cent of agricultural producers, smallholder farmers own only 0.7 per cent of all agricultural land, and medium-holder farmers own 2.2 per cent (INE, 2021).

6 OVERVIEW OF SUPPORT TO MICRO, SMALL, AND MEDIUM-SIZED FOOD PROCESSING ENTERPRISES

In this section, we give a description of the main institutions, policy measures and initiatives that support food processing MSMEs by collecting information from secondary and primary sources (i.e., a stakeholder consultation complemented by a review of policy documents and supporting literature, as previously described in the methodology section).

6.1 NATIONAL AND SUB-NATIONAL INSTITUTIONS, POLICY MEASURES AND INITIATIVES SUPPORTING MSMES

Support for food processing MSMEs comes from a network of development institutions from the central government, ministries, municipalities, guilds, linked to universities, and private

7. See: https://www.chileatiende.gob.cl/fichas/1681-programa-de-desarrollo-de-accion-local-prodesal.

8. See: https://www.sii.cl/portales/mipyme/modulo_fomento/pti.htm.

agencies. Despite efforts to build strong networks in support of MSMEs, the involvement of sub-national institutions has had less of an effect on MSMEs policies (Rodríguez-Auad & Campero, 2020).

Municipalities, for instance, have an Office of Productive Development, but, with some exceptions, they do not have a significant impact due to their lack of resources. Their support basically consists of guiding entrepreneurs to formalize their businesses, on how to pay patents and taxes, and to inform them about subsidies and other funding opportunities. Universities and private initiatives mostly focus on research and development of foods, but these organizations also depend on public sector financial support, which most of the times partially funds their activities.

Some of them are listed in Table 5. In addition, some of their most important programs and policies are detailed in Table 6.

In general, institutions have been focused on enhancing productivity, competitiveness, associational activities, and access to funding through subsidies, co-payments, credit guarantees and special loans for MSMEs. One line of support is based on aid to start enterprises, and with that, to finance investments, implementing business plans, and developing businesses management actions, like training and marketing actions and access to technical assistance.

TABLE 5. National and sub-national institutions that support MSMEs

Level of specialization*	Institution	Main type of support	Dependent Ministry
High	Subsecretary of Economy and Smaller-Sized Enterprises	Production development policies and plans to increase productivity; business acceleration	Economy, Development, and Tourism
	CORFO	Goods, services, and funding in all areas	Economy, Development, and Tourism
	SERCOTEC	Services and subsidies in management and entrepreneurship to micro and small enterprises	
	BancoEstado MicroEmpresas	Funding to micro enterprises	Finance
	PROCHILE	Goods, services, and funding for access to international markets	External Affairs
Partial	INDAP	Services and funding (subsidies) in management and entrepreneurship to agricultural micro and small enterprises (also informal enterprises)	Agriculture
Partial	FOSIS	Services and funding (subsidies) in management and entrepreneurship to micro and small enterprises (also informal enterprises)	Social Development and Family
	SENCE	Trainings to MSMEs (also informal enterprises)	Labor and Social Security
Low	FIA	Goods, services, and funding for innovation, management, and market access	Agriculture
	ACHIPIA	Food safety, trainings, technology, and R&D	
	Department of Nutrition and Foods	Food safety, sanitary food regulation compliance and training	Health

Note: *Specialization regarding the proportion of programs addressed to MSMEs. High: 70 per cent or more; Partial: 20 per cent or more; Low: Specific programs for MSMEs.

Source: Adapted from Rodríguez-Auad and Campero, 2020.

Programs include *Capital Semilla Emprende* and *Capital Abeja Emprende*, from SERCOTEC, which give subsidies aimed at micro-sized entrepreneurs. *Capital Abeja* is particularly relevant, as it is an initiative focused on micro-enterprises owned by women, and further contributes to decreasing the gender gap in entrepreneurial environments.

TABLE 6. Main policy measures and initiatives supporting MSMEs.

Programs / policy	Target public	Type	Objectives	Scope	Link
Capital Semilla Emprende	Micro	Subsidy	Start-up of new enterprises to implement a business plan	National but application dates may differ by region	www.sercotec.cl/capital-semilla-emprende/
Capital Abeja Emprende	Micro	Subsidy	Start-up of new enterprises owned by women to implement a business plan	National but application dates may differ by region	www.sercotec.cl/capital-abeja-emprende/
Crece, Fondo de Desarrollo de Negocios	Micro and Small	Subsidy	Promotes growth, consolidation and/or access to new businesses of MSE	National but application dates may differ by region	www.sercotec.cl/crece/
Formación Empresarial	Micro and Small	Training	Provides knowledge on management and development of business skills	National but application dates may differ by region	www.sercotec.cl/formacion-empresarial/
Semilla Inicia	All sizes	Subsidy	Encourages the creation and start-up of new dynamic ventures with high growth potential	National	www.corfo.cl/sites/cpp/convocatorias/movil/semilla_inicia
Semilla Expande	Micro	Subsidy	Co-finance activities for the initial growth and commercial takeoff of the venture	National	www.corfo.cl/sites/cpp/movil/semilla-expande
Crédito CORFO MIPYME	MSME	Credit	Expanding and/or improving the financing offer for MSMEs through Non-Banking Financial Intermediaries	National	www.corfo.cl/sites/cpp/convocatorias/movil/credito_corfo_mipyme
Garantías CORFO para inversión y capital de trabajo	MSME	Guarantee	Supports long-term funding at financial entities. The guarantee can be used to obtain credit, leasing and factoring	National	www.corfo.cl/sites/cpp/convocatorias/fogain
Garantías CORFO Comercio Exterior	MSME	Guarantee	Supports credits that finance investment or working capital for exporting or producing MSMEs and investment projects in indigenous lands	National	www.corfo.cl/sites/cpp/convocatorias/cobex
Programa Desarrollo de Inversiones (PDI)	INDAP users (Micro)	Subsidy	Supports development of individual or associative investment projects for the incubation, expansion and/or diversification of agricultural or related businesses from Family Farming	National	www.indap.gob.cl/plataforma-de-servicios/programa-desarrollo-de-inversiones-pdi
Programa de Desarrollo Local (PRODESAL)	INDAP users (Micro)	Subsidies and training	Increase the income from forestry, agriculture and related activities of Micro-producers, by selling surpluses to the market as a complement to the total household income	National, managed through municipalities	https://www.indap.gob.cl/plataforma-de-servicios/programa-de-desarrollo-local-prodesal

Source: Authors' elaboration with information from SERCOTEC, CORFO, and INDAP, 2022.

The programs from CORFO are mostly focused on all smaller-sized enterprises that sell at least 200 UF in a year. CORFO manages some of the most important aids for MSMEs, *Semilla Inicia* (formerly known as *Capital Semilla*) and *Semilla Expande*, which provide subsidies to co-finance ventures of high growth potential in their initial stages. According to ClioDinámica (with data from CORFO, 2018), agroindustry and food is the fourth most benefited segment with *Capital Semilla*, with 14.9 per cent of the subsidies awarded between 2010 and 2015. In addition, CORFO also acts as a guarantor for MSMEs at financing institutions.

Lately, the focus has also been on improving the entrepreneurial environment. This is to ease requirements and make MSMEs regulation and fiscal formalization accessible for entrepreneurs. One example is the strengthening of the online system for creating a business in one day, called *"Tu empresa en un día,"*[9] with a cost of less than $1.50 to the entrepreneur (Carrasco, 2020).

Another example is the National MSME Registration, which helps entrepreneurs access benefits and government assistance faster and more easily. In 2010, a regulatory framework for MSMEs was created through Law 20.416, known as the "SME Statute." This established a new institutional framework to promote the development of smaller-sized enterprises. The purpose of the law is to facilitate the development of smaller companies through the adaptation and creation of regulatory norms that govern their initiation, operation, and termination, based on their size and degree of development.

An important institution that serves agricultural and food enterprises is INDAP. They provide services, subsidies, and training to their users, who must be registered. Users should not have assets for more than 3,500 UF, exploit up to 12 hectares of basic irrigation, or live and work on the farm. Additionally, their income must come mainly from agricultural, forestry, or livestock exploitation activities. Some of their main programs for food entrepreneurs are the Investments Development Program (PDI) and the Local Development Program (PRODESAL), which provide subsidies and training to INDAP users. One of the current focuses of INDAP is promoting the economic development of family farmers.

None of the policies, programs or initiatives this study investigated is tailored to enhance MSMEs' responses to FOPNL, rather, they are focused on general economic, business and managerial support. These policies are available for MSMEs from all economic sectors, hence, depending on the economic activity of the company, the support could also be redirected to comply with the sanitary regulation of foods, which includes the obtention of the sanitary license and compliance with Law 20606. For instance, the *Formación Empresarial* Service offers courses, seminars, and workshops aimed at delivering information allowing the development of knowledge, skills and abilities by entrepreneurs (SERCOTEC, 2022). Thus, a specific training module on Law 20606 could also be provided by this service. Indeed, it may complement the online course on the Labeling Law developed by MINSAL and SERCOTEC, described in 5.1.2.

Additionally, the SEREMI of Health has carried out trainings on Law 20606 in different regions of the country. These have been focused on entrepreneurs but also on technical advisors from INDAP, who are usually in charge of the implementation of the institution's programs. In this regard, trained, qualified advisors could guide micro and small producers not only to the sanitary

9. See: https://www.registrodeempresasysociedades.cl.

regulation compliance but also in the obtention of marketing labels like those presented in 5.1.4., likewise in the correct use of the "High in" labels to comprehensively support entrepreneurs on labeling and business and products development. This is especially relevant for food processing micro entrepreneurs who are INDAP users under the PRODESAL and PDI programs.

6.2 SUPPORT TO ENHANCE COMPLIANCE OF MICRO AND SMALL-SIZE FOOD PROCESSING ENTERPRISES TO FOPNL

6.2.1 Awareness raising

During the initial 36-month grace period for small enterprises, and the subsequent 36 months for micro-enterprises, the implementation of Law 20606 has been continuously assessed.

According to data gathered through the stakeholder consultation with the Ministry of Health and the Ministry of Agriculture, the public sector's first significant outreach to micro and small enterprises began in 2017, following the enactment of Law 20606. This effort was marked by a multi-sectoral collaboration among government services, focusing on supporting micro and small entrepreneurs. To help understand the labeling requirements outlined in Law 20606, manuals and videos were developed, which will be discussed in the following subsection.

Subsequent media campaigns targeted food processing MSMEs, aiming to raise awareness about labeling requirements and available training resources. These campaigns included web-based courses with instructions on calculating the content of key nutrients and applying the appropriate labels.

At the decentralized level, the public sector has funded initiatives. Representatives from the SEREMI of Health confirmed that the central government allocated additional resources to regions to support regional workshops on front-of-package labeling for targeted nutrients. In each region, a new temporary position was created to manage and organize these workshops and related follow-up activities. The training and workshops at the regional level were based on multi-sectoral collaboration, with each institution contributing additional support through its regular programs.

6.2.2 Training and associated materials

The collaborative work between MINSAL, MINECON, INDAP, and ACHIPIA helped elaborate the "Manual for Nutritional Labeling of Foods" (updated in 2019; see Figure 4),[10] which describes and explains the technical requirements regarding the "High in" labels that products that exceed the thresholds of energy, sodium, saturated fats, and sugars need to adopt. The manual includes instructions on calculating the content of targeted nutrients and deciding which labels to include. In 2018, participating agencies and ministries also developed video tutorials, turning the manual's subjects into audiovisual content to facilitate the spread of information and the adaptation of producers. These tutorials are available on the MINSAL website.[11]

Following the implementation of the law, the MINSAL carried out various actions that sought to promote the development of healthy food environments in the different regions of the country.

10. See Annex.

11. See: https://www.minsal.cl/ley-de-alimentos-manual-etiquetado-nutricional/.

One of the main activities related to food processing MSMEs was the implementation of Schools for Promoters. These schools aimed to promote the development of citizens' participation and understanding of Law 20606. According to DIPOL (2017), at the national level, 21 Schools were held for public officials in 14 regions of the country, with approximately 1,500 participants, and 29 Schools for social leaders in the 15 regions of the country, with 1,900 participants.

FIGURE 4. Extract from the Manual for Nutritional Labeling of Foods

Source: Author's ellaboration.

Additionally, according to a representative from MINSAL, there was cross-sector work between MINSAL, INDAP, ACHIPIA, and the Service of Technical Cooperation (SERCOTEC) from MINECON at a central level. The activities started in 2018 when technical instruction for micro-entrepreneurs on mandatory nutritional labeling, including the front-of-package warning sign, was planned. These sessions were attended by producers, technical advisors from government institutions and consultants from the private sector. Training sessions started in 2019 at a decentralized level, and their regional implementation and management were overseen by the Solidarity and Social Investment Fund (FOSIS), funded by the Ministry of Social Development and Family (MIDESO). According to their data, more than a thousand people were trained through this initiative. Still, several entrepreneurs were not aware of the sessions, as was discussed in the stakeholder consultation. Unfortunately, there is no publicly available and disaggregated data on the extent of the sessions at the regional or subnational level.

Also, in 2019, an online course on the front-of-package label to comply with Law 20606 was designed by MINSAL and SERCOTEC and made available to the public in early 2020. The course comprises two modules in which the technical specifications of the mandatory

labels are described. The course is available on the SERCOTEC website,[12] and any interested stakeholder can sign up for the capsule for free. The online course has been advertised in media campaigns, which increased participation tenfold during the advertising period. The details are shown in Table 7.

TABLE 7. Flow of inscriptions on the "Labeling Law" online course

Month	Inscriptions	Finalized	Finalized (%)
2020			
October	137	95	69
November	1232	600	49
December	97	79	81
2021			
January	66	55	83
February	59	43	72
March	41	24	59
April	71	50	70.4
May	39	35	90
June	45	32	71
July	43	27	63
August	54	40	74
September	48	30	63
October	36	27	75

Source: MINSAL's presentation in the consultation, November 16, 2021.

Meanwhile, ACHIPIA organized regional training sessions on nutritional labeling for micro and small-sized enterprises, executed through the Regional Advisory Commissions in Food Safety and Quality (CARs). ACHIPIA coordinated them at the central level and the SEREMI of Agriculture at the regional level. These theoretical and practical sessions are aimed at educating people on Law 20606 and labeling through the use of food composition tables. The workshops were carried out in 2019, and 625 people were trained in the regions Biobío, La Araucanía, Tarapacá, Arica y Parinacota, Maule, O'Higgins, Aysén, and the Metropolitan Region.

6.2.3 Research and development of food products

Law 20606 on FOPNL has been shown to have encouraged the industry to reformulate foods that exceeded targeted nutrients and to develop alternatives (Corvalán et al., 2021). In the same vein, ACHIPIA, INDAP, and Transforma Alimentos have collaborated on a pilot project to help some MSMEs benefit from reformulation and the market repositioning of reformulated food products.

Transforma Alimentos is a public-private initiative from the Ministry of Agriculture that promotes the Chilean food industry and helps micro, small, and medium-sized food enterprises reformulate their products. The objective of the project was to develop and implement targeted nutrient reduction plans through technological improvements and the

12. See: https://capacitacion.sercotec.cl/portal/cursos/ley-de-etiquetado.

adoption of Good Manufacturing Practices. The plans were validated by MINSAL, allowing the commercialization of reformulated food products with fewer or none of the Law 20606 FOPNL.

The implementation of the project was granted to the Centre of Science and Food Technology Studies from the University of Santiago (CECTA-USACH). The project was carried out under the Agreements on Clean Production of Healthy Foods (APLAS), which included a diagnosis of selected food products, a negotiation on technological routes, the signing of the agreement with entrepreneurs and the public sector who engaged in one of the plans, and finally, the implementation through workshops, training, audits, and continuous monitoring.

The initiative targeted smaller-sized and sanitary-certified producers, and participation was voluntary. The economic activities and locations of the participating MSMEs were:

- Processed meats from the Biobío Region.
- Jams and preserved fruit from Del Maule Region.
- Cheese from Biobío and Los Ríos Regions.

As a representative from ACHIPIA pointed out during the stakeholder consultation, there were two more regions initially considered for the project, O'Higgins and La Araucanía. Still, they could not be included due to the lack of sanitary-certified, fiscally registered micro-enterprises.

An important aspect that was considered in the implementation of the project was the reduction of targeted nutrients while keeping the quality associated with the artisanal production methods of each food. According to representatives from ACHIPIA and CECTA-USACH, this was achieved. Within the project, workshops were also carried out on calculating production costs, developing marketing strategies, and calculating the nutrient composition of processed foods.

6.2.4 Interlinkages with other supportive measures

During the stakeholder consultation, a representative from INDAP outlined several government initiatives to support food processing MSMEs, focusing on food safety, fiscal formalization and marketing strategies linked to labeling quality attributes. The discussion emphasized that initiatives to enhance food processing MSMEs' responses to FOPNL are influenced by comprehensive efforts to promote the sustainability of smaller-sized food processing businesses.

For two decades, these efforts have been integral in helping food processing businesses navigate the regulatory landscape. They began with investments aimed at securing Sanitary Licenses and guiding entrepreneurs towards fiscal formalization. In partnership with MINSAL, a technical guide was developed to help small and medium-sized food processing plants achieve sanitary certification, detailing the necessary technical specifications and compliance requirements.[13]

The initiative to link marketing with labeling quality attributes began with the *"Sabores del Campo"* program (Fig. 5a). It focused on two dimensions. The first was food safety, which included support, monitoring, and audits of production processes. This encompassed assistance with the sanitary certification process, the implementation of Good Manufacturing Practices, and

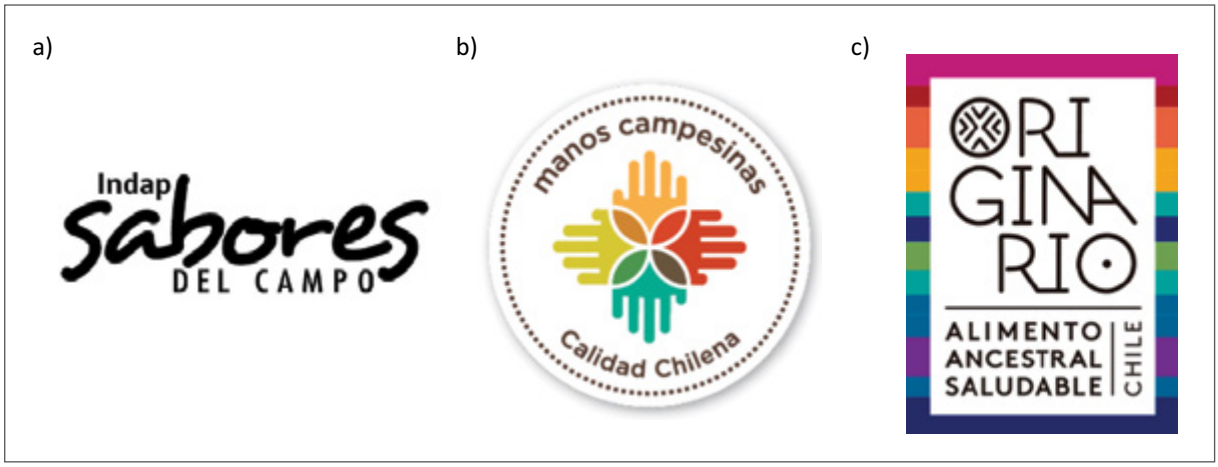
13. See Annex.

conducting microbiological and nutrient analyses of food products. The second area concentrated on business development, offering services such as market research, commercialization and trade consulting, management, and marketing support, including logo and label design.

The Food Labeling Program was offered between 2006 and 2009. It was introduced to improve the image and labeling of the foods produced by smallholder farmers. It focused on standardizing company logos and labels while ensuring compliance with nutrition labeling requirements. In 2015, INDAP and the University of Chile developed the *"Manos Campesinas"* label (Fig. 5b). This label certifies that foods produced by family farmers meet safety requirements and current legal regulations, are artisan-made, and support local development. Market research indicates that, in addition to flavor, these were some of the most valued attributes associated with the label.

In 2021 INDAP and Elige Vivir Sano[14] implemented the *"Sello Originario"* program (Fig. 5c). This label is linked to a certification that foods were produced by native smallholder farmers using local raw materials, are artisan-made, and do not have any FOPNL "High in" labels. By doing so, it helps these products appeal to health-conscious consumers, thereby supporting the commercial sustainability of smallholder businesses.

FIGURE 5. a. *Sabores del Campo* label, b. *Manos Campesinas* label, c. *Sello Originario* label



Source: Author's ellaboration.

7 CASE STUDIES

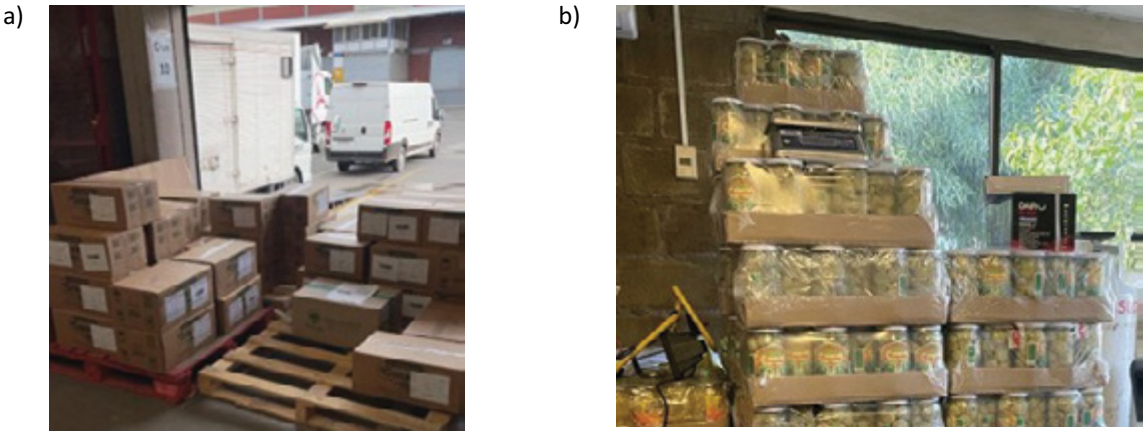
In this section, we present cases of micro and small food processing enterprises and their responses to FOPNL, Law 20.606. Three companies were selected to participate: *Enterprise a*, located in the Copiapó municipality which produces olives and olive preparations; *Enterprise b*, a business from the commune of Licantén in Del Maule Region that makes jams, fruit preserves, chutneys, spreads, and *manjar*; and *Enterprise c*, a food company focused on the production of processed artichokes and preserved papayas, located in the commune of Maipú in the Metropolitan Region of Santiago (Figure 6).

14. See: http://eligevivirsano.gob.cl/sobre-nosotros/.

FIGURE 6. a. Enterprise *a* product, b. Enterprise *b* product, c. Enterprise *c* product

Source: Photo by the authors.

FIGURE 7. Enterprise *c* facilities



Source: Photo by the authors.

FIGURE 8. Visit to Enterprise *b* at *Expo Mundo Rural*

Source: Photo by the authors.

7.1 BUSINESSES AND ENTREPRENEURS' CHARACTERISTICS

TABLE 8. Responses to indicators of businesses and entrepreneurs' characteristics

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Age of the company (or year of establishment)	2007	2007	1980
Age since fiscal formalization (or year of formalization)	2016	1993, 2006 addition of line of business	1980
Type of ownership (family business, limited society, etc.)	Natural person (2 different owners)	Natural person	Limited liability company (*Sociedad Agroindustrial*)
Number of workers	Variable. Farm: 1 permanent worker, 7-10 to harvest period. Factory: just the owner	2 permanent workers (husband and son), 2 seasonal workers from November to May	9 permanent workers and 2-3 more in demanding seasons
Educational level of the manager	Bachelor's degree (Languages and architectonic design)	Upper secondary education	Short-cycle tertiary education (Food technician)
Difference in sales level due to law implementation	No differences observed	Not informed	No differences observed
Current annual sales level (CLP)	$12,000,000	Not informed	$200,000,000

Source: Authors' elaboration.

As informed by the entrepreneur *a*, Enterprise *a* is a micro-sized company. The representative of the company pointed out that the business is divided into two, the processing company, in which she is the legal owner, and a 5-hectares olive farm legally owned by her husband. Additionally, she uses 2.5 hectares from the Institute of Agricultural and Livestock Development (INDAP) under a commodatum agreement. Her husband is the provider of raw olives to Enterprise *a*'s business, billing her once or twice per year. The company started production in 2007, but its fiscal formalization was in 2016. Regarding the number of workers, the entrepreneur mentioned that the farm has only 1 permanent worker who looks after cultural practices and guards the farm. During the harvest period, they hire 7 to 10 more employees, in addition to a couple of people who do harvesting work in exchange of living in the farm. In the processing factory, most of times the entrepreneur *a* works alone and in busiest periods she can use the help of a relative. Both the entrepreneur and her husband hold a bachelor's degree.

Regarding the level of sales, the entrepreneur *a* indicated that before Law 20606 implementation, i.e., 2017-2018, the processing company had an annual level of sales of approximately CLP $12,000,000, an amount she describes as "very good." By those years, their main channel was the direct sale to the public. In 2019, she started to use the labels, and she reported that sales shrunk. However, that same year, there was a social outburst in the country, and in 2020, the COVID pandemic deepened the bad economic results for her business, selling approximately 33 per cent less in value. The entrepreneur *a* was not able to determine if the application of the "High in" labels was a key factor affecting her sales. Instead, she blames the social crisis and the pandemic. Only in 2022 was the company able to recover sales levels from 2018, although their main current clients are 20 gourmet stores throughout the country, especially the ones located in the Tarapacá Region and in Patagonia. Lately, Enterprise *a* has

been implementing agrotourism activities, selling the same quantity in 1 hour at the same price as in 2 days at a rural fair. In addition, in 2022, the company was able to introduce its products in a local supermarket (*Unimarc*), under the program *"100% nuestro,"* aimed at displaying and selling products made by micro-sized entrepreneurs.

Enterprise *b* is a food-processing company owned by a family farmer (entrepreneur *b*). As she declared, her business is a micro-sized enterprise, although she was not able to inform us of sales levels. The enterprise was established in 2007, the same year it started production, even though its fiscal formalization occurred in 2006 after adding a line of business to the entrepreneur register at the Internal Revenue Service (SII). Entrepreneur *b* produces the foods, also, her son and husband work permanently in the company, helping in production and sales. There are 2 additional people who are hired occasionally, mainly between November and May of each year, following the most demanding production periods. Regarding the level of instruction of the manager of the company, the entrepreneur *b* finished her upper-secondary education. Enterprise *b*'s main customers are tourists from Licantén and other coastal communes nearby, gourmet stores, and chocolate shops. Another important customer of the company is "*Tiendas Mundo Rural*," which are stores created under an INDAP short commercialization circuit program aimed at bringing closer goods made by family farmers to urban centers. As entrepreneur *b* acknowledges, she is not aware of the level of sales of her business, alleging that her son is in charge of that data. It was not possible to retrieve the information.

On the other hand, Enterprise *c*, a limited liability company, was described as a micro-sized food enterprise by its representative. However, according to the information provided by the representative, Enterprise *c* can be categorized as a small-sized company by sales and the total number of workers. Entrepreneur *c* is the spouse of the manager, who is a food technician. The business was born in 1980, the same year of its fiscal formalization. In its origins, the company started growing artichokes in the owners' 10 hectares farm, but due to the lack of water for irrigation and constant thefts, they decided to buy raw artichokes and papayas from local farmers to process them into preserves. Enterprise *c* employs 9 permanent workers; 2 or 3 more people are hired during demanding seasons. They reported an annual average sales level of CLP $200 million during the last 5 years, with no observed differences before and after the implementation of the law. Their main clients are a supermarket chain and gourmet stores. As entrepreneur *c* claims, they have had long relationships with loyal customers.

Enterprise *a* prepares foodstuff made from raw olives. One of its production lines focuses on natural olives, which are sold in 3 different packages by size, and olives with spices packed in glass jars. Most olives are prepared under traditional techniques, although entrepreneur a acknowledges she is currently venturing in the production of "Greek olives", which is a type of preparation that do not uses water but vinegar, sugar, and salt. The company also makes extra-virgin olive oil sold in 3 different sizes, in addition to olive oil with rosemary leaves. Another line of products are natural olive spreads, some of them with addition of *merkén* chili and garlic, sold in two different sizes to general public and a 300 g format to restaurants. Finally, the company sells sea salt with rosemary and Greek olives, and an infusion made from olive tree leaves.

7.2 PRODUCT CHARACTERISTICS AND PRODUCTION PROCESSES

TABLE 9. Responses to indicators of product characteristics and production processes

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Description of products	Olives, olive oil, olive spreads, olive leaf infusions, cosmetics	Jams, fruit preserves, chutneys, spreads, and *manjar* or *dulce de leche.*	Ready-to-use artichoke hearts and preserved papayas
Products subject to regulation	Olives and spreads	All but jams and *manjar* made with sweeteners (sugar-free)	Papayas
Nutritional labeling before Law 20606	Yes, but only olives and olive oil	Yes	Yes
Additional labeling (e.g. Manos Campesinas, Comercio Justo, Sello de Origen, etc.)	Manos Campesinas, GMP from supermarket chain (Unimarc in 2022)	Manos Campesinas.	No
Elaboration technology (i.e., is artisan made?)	Artisan made, although they make chutney and spreads with machines since 2020	Artisan made	Artisan made
Enterprise has equipment or machinery	Spreads and chutney maker, pasteurizing kettle, oil press, olive sorter	Industrial stoves, stainless steel countertops, fridge, scullery sink, precision scale, thermometer, pH meter	Industrial stoves, sealers, scales, cold storage
Value of equipment or machinery, if applicable (CLP)	$34,500,000	$15,000,000	Not informed

Source: Authors' elaboration.

All Enterprise *a*'s products are artisan-made, although since 2020, the company has used the help of a machine to prepare spreads and chutneys. Enterprise *a* products subject to the law are olives and olive spreads. Entrepreneur *a* points out that before Law 20606 only olives and olive oil had nutrition labeling, i.e. nutrition fact tables. Since 2019, she has been working on the enterprise labeling strategy as a result of her participation in a project from the Foundation for the Agricultural Innovation (FIA), which is further detailed in the next criteria. Enterprise *a* has the *Manos Campesinas* label, and a good manufacturing practices (GMP) label from the company's participation in the program *100% Nuestro*, managed by the Chilean supermarket chain *Unimarc*. Regarding machinery and equipment, the entrepreneur *a* declares to own a spread and chutney maker valued at $7,000,000, and a pasteurizing kettle valued at $5,000,000, both bought in 2020 with the aid of the Service of Technical Cooperation (SERCOTEC). Additionally, the company holds an oil press bought in 2022 with support from INDAP and valued at $22,000,000, and an olive sorter that costed $500,000 back in 2007. All values are expressed in Chilean pesos.

Enterprise *b* sells mostly fruit preparations like jams and fruit preserves. They also prepare chutneys, spreads, and *manjar* or *dulce de leche*. The company has developed more than 60 varieties of products, including a sugar-free line. Most of their creations are presented in jars containing 260 and 500 grams. Entrepreneur *b* states that most of her products are subject to the FOPNL regulation, with the exception of those made with sucralose and tagatose. She declares to have had nutrition labeling (nutrition facts tables) before the implementation of Law 20606, as well as the *Manos Campesinas* label. Regarding production techniques, all their

foods are artisan-made. According to the entrepreneur, they own machinery and equipment valued at CLP $15,000,000, among which are industrial stoves, stainless steel countertops, a fridge, a scullery sink, a precision scale, a thermometer, and a pH meter.

Enterprise *c* elaborates ready-to-use artichoke hearts and preserved papayas. Their artichokes come in plastic packages of 400 and 1600 grams, jars of 1000 grams, and their papayas also come in jars of 1000 grams. Only papayas are subject to the FOPNL regulation since they are preserved in refined sugar, whilst artichokes are low in sodium. The representative of the company expressed that all Enterprise *c*'s products had nutrition facts tables before the regulation. They do not have any additional labels. Furthermore, all their production is artisan-made. Regarding equipment, the company owns industrial stoves, sealers, scales, and cold storage.

FIGURE 9. Enterprise *b* workers at their facilities in Licantén

Source: Photo by the authors.

7.3 STRATEGIES ADOPTED TO COMPLY WITH LAW 20606

TABLE 10. Responses to indicators of strategies adopted to comply with law 20606

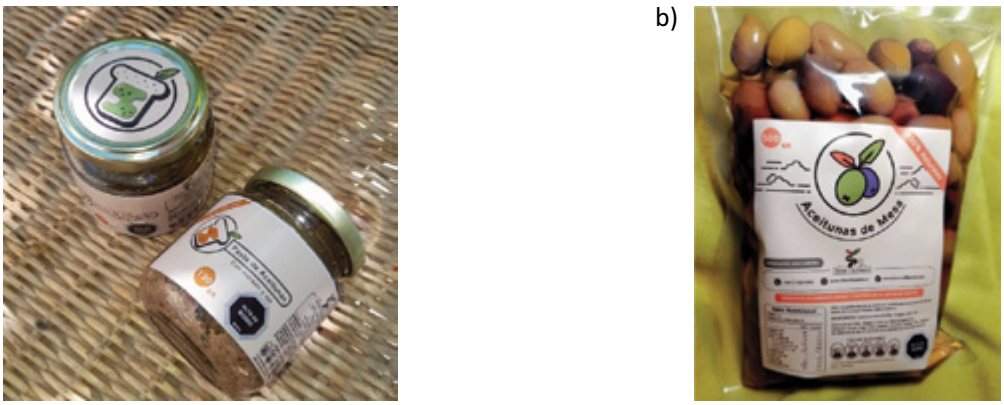
Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Did the entrepreneur apply new labeling?	Yes (in 2019)	Only on demand	Yes (in 2019)
Which labels did their apply? (If applicable)	High in sodium	High in sugars, High in sodium	High in sugars
Which products (or a proportion of their total) are subject to labeling?	Olives and spreads	All but those containing sweeteners	Papayas
Did the entrepreneur reformulate products?	No	Lowering sugar and salt contents to all products	No
Which products (or a proportion of their total) were reformulated?	Not applicable	All	Not applicable
Did the entrepreneur adopt any additional strategy? (e.g., new commercial opportunities)	Renewed logo and label design, brochures for products	Before Law 20606 the company started making sugar-free products	No

Source: Authors' elaboration.

Regarding the adopted strategies to comply with Law 20606, in 2019 Enterprise *a* started to add High in Sodium labeling to olives and spreads (Fig. 10), initially following nutritional information from the USDA food composition tables, and then from the results of nutrient composition analyses made for each of its products. The company did not reformulate products, even though the entrepreneur expressed the intention of following a low-sodium olives recipe developed by the Institute of Agricultural and Livestock Research (INIA). In addition, in the same year, the entrepreneur *a* implemented a branding strategy focused on renewing logo and label designs, as well as introducing products brochures. As a result, it was necessary to conduct a market analysis. However, the labeling renewal was subject to the technical capabilities of the company's printers.

FIGURE 10. Enterprise *a* products with High in Sodium labels

a) b)



Source: Photo by the authors.

FIGURE 11. Papayas with High in Sugars label from Enterprise *c*

Source: Photo by the authors.

Enterprise *b* applies High in Sugars and High in Sodium labels depending on the product. They add the labels only on request, justifying that their competitors have not implemented the labeling. The entrepreneur fears that customers might assume that Enterprise *b*'s foods are

unhealthy in comparison to the competition. All their products are subject to labeling, with the only exception of those made using sweeteners. Entrepreneur *b* states that all her products were reformulated, specifically using less sugar and salt. Nonetheless, she does not believe it can be ruled out that the use of High in labels with the new recipes. She advocates for their recipes and for the use of sugar and salt as natural preservatives.

On the other hand, Enterprise *c* applies High in Sugars labels to their preserved papayas since 2019 (Fig. 11), following the request of its main customer, a supermarket. They did not reformulate their products, claiming to have constant sales that are enough for their capacity.

7.4 INVESTMENTS AND COSTS ASSOCIATED WITH ADOPTED STRATEGIES

TABLE 11. Responses to indicators of investments and costs associated with adopted strategies

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Difference in unitary costs of products due to labeling	No difference but cost of renewing brand label	No difference but cost of High in adhesive labels	No observed difference
Difference in unitary costs of products due to reformulation	Not applicable	Most products have less sugar, hence costs lowered; higher costs only when using sweeteners (amount not informed)	Not applicable
Cost of labeling implementation (CLP)	$17,000,000 (branding strategy)	Low expenditure (data not informed)	Low expenditure (data not informed)
Cost of reformulation implementation	Not applicable	Not informed	Not applicable
Investments related to application of the law (CLP)	$830,000 in compounds studies	$600,000 in equipment.	No investments
Financial losses (CLP)	No	$800,000 in products made with tagatose	No

Source: Authors' elaboration.

Regarding investments and costs incurred by the enterprises to comply with the regulation, the three companies did not observe substantial differences in unitary costs of their products due to the implementation of the "High in" labeling. In general, the only additional cost was the adhesive label, which companies rated as negligible since they could purchase them directly from the vendors to add them to their packaging. The three companies stated they print their labels upon demand, hence there are no significant losses related to packaging. Regarding cost differences due to product reformulation, Enterprise *b*, which was the only company that reformulated its products, informed that costs should have decreased, since their new recipes contain less sugar, with the only exception being jams made with sweeteners. However, they did not present detailed estimates or statistics.
In relation to the cost of labeling implementation, the representative from Enterprise *a* estimated that the branding strategy investment rises up to CLP $17,000,000, of which 7 to 10 million were allocated solely to label design studies (brand) and marketing plan. The remaining amount was used to design a website and to buy furniture. Certainly, these figures overestimate the investments made to respond to Law 20606. In the project, the entrepreneur *b* only accounted for CLP $2 million, whilst FIA contributed the remaining CLP $15 million. Enterprise *b* and Enterprise *c* expressed a low expenditure related to labeling

implementation, although they did not provide a specific amount. Another investment informed by Enterprise *a* added up to CLP $130,000 for polyphenols studies and CLP $700,000 for nutritional analyses of spreads. In 2016, Enterprise *b* also incurred investments accounting for CLP $600,000 in equipment related to responses to the law, specifically an accuracy scale, a pH meter, and a thermometer. The only company that acknowledge financial losses was Enterprise *b*, which made sugar-free jams, adding tagatose as part of its product reformulation strategy. Tagatose is a natural sweetener, healthier than its substitutes but more expensive. According to the entrepreneur *b*, jams made with tagatose were priced 3 times higher than those made using sucralose, and the latter were 30 per cent more expensive than those made of sugar. Additionally, the products made with sweeteners contained 90 grams less than the jams made with sugar. Entrepreneur *b* reported that in 2020, when the pandemic began, the company dropped its sales and especially those of jams made with tagatose, since the price was higher than those made with sugar and their shelf life was shorter. She estimates that her losses were approximately CLP $800,000.

7.5 KNOWLEDGE AND USEFULNESS OF SUPPORT MEASURES

TABLE 12. Responses to indicators of knowledge and usefulness of support measures

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Awareness of the timeframe of the law	Yes	Yes	Yes
Awareness of the additional extended timeframe for microenterprises (impl. 2022)	No	No	No
Impressions of general support to MSMEs (not focused on their enterprises)	Good support from INDAP	In general, good support from INDAP, but poor support and training on Law 20606	Never received official information of support policies

Source: Authors' elaboration.

The representatives from Enterprise *a*, Enterprise *b*, and Enterprise *c* confirmed having known the initial timeframe of Law 20606. However, they were not aware of the additional 36-month extension, which ended in June 2022, for micro-sized enterprises to comply with the regulation. The 3 companies were informed of these developments at the first stakeholder consultation organized under this research. The representative of Enterprise *a* claimed to have received the information from a food engineer hired under a SERCOTEC project in which she participated. In general, she considered that support for MSMEs has been good, especially from INDAP talks. On the other hand, the representative of Enterprise *b* declared that the trainings to MSMEs regarding Law 20606 implementation has been very basic, and the support to MSMEs is still deficient, for instance, in terms of aid to nutritional analyses. Nonetheless, she also considered that INDAP offers good general support to food MSMEs. The representative of Enterprise *c* affirmed that they had never received official information from the public sector; they first heard of the new regulation on local news.

7.6 SUPPORT RECEIVED

TABLE 13. Responses to indicators of support received

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Did the entrepreneur receive training on law 20606?	Yes	Yes	Yes
Did the entrepreneur receive training on law 20606 from the public sector?	Yes	Yes	No
Type of public training (if) received: manuals, videos, online courses, etc.	Manual (MINSAL), Microsoft Excel® spreadsheet	Online workshop (SERCOTEC) and courses (INDAP)	Not applicable.
Did the entrepreneur receive training on law 20606 from the private sector (retailers, agencies, etc.)?	No	No	Yes, from a supermarket chain
Type of private training (if) received: manuals, videos, online courses, etc.	Not applicable	Not applicable	On-site technical support from supermarket advisor regarding to labels design
Additional supportive measures (i.e., participation in other food labeling programs)	Participant in Manos Campesinas and GMP programs	Participant in *Manos Campesinas*	No

Source: Authors' elaboration.

All the companies confirmed they have received external support on Law 20606. Enterprise *c*'s workers received guidance from their main customer, a supermarket chain, by a technical advisor who visited the company and coached them on the "High in" labels design. On the contrary, Enterprise *b* received some training from the public sector, through workshops and online courses from INDAP and SERCOTEC, focused on sugar reduction. However, they also heard of the law for the first time on TV news. The representative of Enterprise *a* has access to a manual for nutritional labeling focused on Law 20606, developed by the Ministry of Health (MINSAL), as well as a spreadsheet to calculate critical nutrients in her products. In addition, Enterprise *a* and Enterprise *b* have the *Manos Campesinas* certification. Enterprise *a* also owns a Good Manufacturing Practices certification from the supermarket chain *Unimarc*, as it was previously exposed in the second criterion on product characteristics and production processes.

FIGURE 12. Products from Enterprises *a* and *c* at supermarket gondolas

a)

b)

Source: Photo by the authors.

7.7 OPPORTUNITIES AND CONSTRAINTS OF SUPPORT RECEIVED

TABLE 14. Responses to indicators of opportunities and constraints of support received

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Awareness of trainings and measures exposed at the workshop	Yes	Yes	No
Opinions on support received, usefulness and limitations	Good support. Critical of the process and requirements to apply the labels	Good. However, she argues that there should be more support for nutritional analyses	Not applicable
Opinions of technical advisors	Good but public advisors constantly changing	Good in general, depending on the training	Not applicable
Access to funding	Yes, mainly due to her knowledge on project preparation	Yes, credits and subsidies	Funding through banks; subsidies are very low to their needs

Source: Authors' elaboration.

The representatives from Enterprise *a* and Enterprise *b* were aware of the trainings and measures exposed at the stakeholder consultation organized under this research, whereas the representative of Enterprise *c* did not receive this information. As she revealed, the company did not receive support from the public sector; on the one hand, because of the negative attitude of the manager regarding getting external help, and on the other hand, because the subsidies given by public institutions are very low to their necessities and expectations. By way of example, they requested help from the Chilean Economic Development Agency (CORFO) to finance equipment worth CLP $18,000,000. The subsidy only covered around 20-25 per cent, so they were unable to purchase the equipment. In general, Enterprise *c* has good access to funding through private banks. Besides, the only support received by the company regarding the law was the technical advice on labeling design by its supermarket client.

The representative from Enterprise *a* revealed that her company has received good and complete support from public institutions, but she assumes it is mainly due to her good educational level and knowledge of tools to reach the assistance. For instance, using a laptop or the internet. One of her milestones was the opportunity to visit olive oil factories in Italy, thanks to funding from public institutions. Nonetheless, she considered that FDA's food composition tables are hard to interpret, and the nutrient composition values do not reflect Chilean products. Overall, she was grateful for technical advisors, but as public development programs are lengthy, there is a great rotation of specialists. Consequently, it is necessary to start over as a new professional is hired into the program. As for access to financing, the entrepreneur considered herself "lucky" since she received several subsidies. She emphasized that this is due to her knowledge of project preparation. Indeed, she also assisted neighboring entrepreneurs in applying for public funds.

On the other hand, entrepreneur *b* has received support to buy jars and a sealing machine from CORFO, to implement a clean line for the processing channel as a waste management measure from SERCOTEC, and to buy industrial countertops and other kitchen equipment from FOSIS. She is constantly invited to rural fairs organized by INDAP. In addition, she also used bank credits from *BancoEstado* (State-run commercial bank). Entrepreneur *b* has a good opinion on technical advisors in terms of product reformulation, especially in training on sugar reduction for jams and fruit preserves. However, she acknowledged that some recipes shown in one of the

trainings were not healthier than hers. To illustrate, one advisor used cornstarch as a thickener for jams, which makes them to come up with more calories. Overall, in line with entrepreneur *a*'s opinion, entrepreneur *b* considers that FDA's food composition tables are not representative of Chilean products, suggesting more trainings and funds for nutritional analyses.

7.8 MAIN ADDITIONAL CHALLENGES AND GAPS IDENTIFIED

TABLE 15. Responses to indicators of main additional challenges and gaps identified

Indicator	Enterprise *a*	Enterprise *b*	Enterprise *c*
Impressions on the law and its usefulness	The idea is good in aiming to offset obesity, but application is hard and expensive if each food were analyzed. Critics on reformulation of products using synthetic components	It might be useful, but clients are not concerned with the number of labels. People are used to eating sugary foods	Useful to fight obesity. People read the labels when purchasing foods and apparently tend to prefer those foods with less "High in" labels
Impressions on the application to MSMEs	Difficult to interpret FDA tables	Not much aid and inspection, just on nutritional information.	Not clear how the supervision to MSMEs complying works.
Considerations on food labeling requirements and businesses formalization	Fiscal formalization and accounting complying is hard, much demanding on MSMEs regarding tax and costs control; good knowledge on sanitary licenses	Food labeling requirements can be expensive and difficult to comply with. Public institutions are stricter and more exigent with formal businesses regarding to labeling and accounting than those who are not fiscally formalized	Fiscal formalization was easy, as well as obtaining the sanitary license. They were guided by the SEREMI of Health by the time they opened the business. However, there has been no sanitary inspection throughout the years

Source: Authors' elaboration.

In general, the three enterprises agreed on the necessity to use public instruments to contribute to reducing the incidence of obesity. However, their impressions on the application of the law and the reception by Chilean consumers differ. To the representative of Enterprise *c*, the regulation seemed helpful to influence consumers' choice. People would consider FOPNL when purchasing groceries, and apparently tend to prefer those foods with fewer "High in" labels. Instead, the representative of Enterprise *b* considered the law might be useful, but has noticed that customers are not concerned with nutrition labels on the front of the package. People are used to eating sugary foods. In fact, she reported her sugar-free products are almost exclusively bought by people with dietary restrictions and diabetes. For the representative of Enterprise *a*, the intention of the law is good in terms of targeting obesity, but its application is difficult in terms of inspection.

According to the entrepreneur, FDA's food composition tables are difficult to interpret and read, suggesting that the mandatory applications of labels should be based on nutritional analyses instead. However, she acknowledged the high cost and low viability of such a requirement. She also highlighted the importance of sugar and sodium as natural, low-cost preservatives. The reformulation of products might not be a good solution if substitutes raise costs and are perceived by consumers as unhealthy or unnatural. Similarly, but focusing on the application of the law by MSMEs, both Enterprise *b* and Enterprise *c* representatives agreed that the sanitary inspection from national authorities is mostly on nutrition fact tables that

are usually on the back of the package. Finally, regarding food labeling requirements and businesses formalization, the entrepreneur *a* declares that fiscal formalization and accounting compliance could be difficult for small-sized entrepreneurs, especially in terms of tax and costs control. Entrepreneur *c* pointed out that fiscal formalization was easy, as well as obtaining the sanitary license. For her part, entrepreneur *b* expressed that food labeling requirements could be difficult to meet and also expensive for MSMEs, especially if products are subjected to nutritional analyses.

8 DISCUSSION

The varying responses of the interviewed smaller-sized food processing enterprises to Front-of-Pack Nutrition Labeling (FOPNL) under Chile's Law 20.606 highlight the influence of business capabilities and technical knowledge, product characteristics, finance and costs, market orientation, consumer preferences, supply chain factors, and support structures.

The companies' level of business capabilities and technical knowledge varies, influencing their response to FOPNL. Enterprise A, managed by an individual with a bachelor's degree, revealed that a good educational level and knowledge of the tools to reach assistance were crucial. Enterprise A was proactive in implementing FOPNL and developing a comprehensive strategy. In contrast, Enterprise B, with a manager possessing upper secondary education, showed less structured strategic planning for responding to FOPNL, such as applying labels only on demand and incurring financial losses associated with reformulated products, though receiving comprehensive support from public institutions. Enterprise C, led by a food technician, had higher integration with distribution channels, receiving direct guidance from a supermarket chain, which likely contributed to its successful compliance without product reformulation. Enterprises with higher levels of business capabilities and technical knowledge were more proactive and successful in navigating the challenges of FOPNL. At the same time, those with fewer resources and lower educational backgrounds faced more difficulties, particularly in terms of product reformulation and market orientation.

The products' portfolio, food products characteristics and processing options influenced how each enterprise responded to FOPNL. Enterprise A's olives and spreads required specific labeling due to their sodium content and restricted possibilities for reducing it without changing quality attributes valued by consumers. While it did not reformulate its products, the enterprise explored new recipes to preserve olives and emphasized branding and information to mitigate potential negative perceptions of FOPNL. Enterprise B had most of its products subject to labeling, pushing the company to reformulate by reducing sugar and salt content. Enterprise C, with a limited range of products subject to labeling (only papayas), did not reformulate, relying on its consistent sales and established market relationships.

Financial support shaped the responses of these enterprises to FOPNL. Enterprise A invested in rebranding and marketing, supported by external funding, which eased the financial burden. The cost of labeling compliance for Enterprise B was relatively low. Still, the company received comprehensive free-of-cost public support by participating in a research and product reformulation project to reduce targeted nutrients and workshops for calculating production costs, developing marketing strategies, and calculating the nutrient composition of processed foods. Enterprise B faced financial losses due to its unsuccessful commercialization of products reformulated with expensive sweeteners. Enterprise C reported minimal financial

impact, largely because it did not need to reformulate its products, and its stable market position absorbed its low labeling costs. The case study data show that the financial access and losses incurred when smaller-sized enterprises by dealing with the FOP nutrition labeling requirements may vary according to the strategies adopted, consumers' responses, and the cost and level of financial support received.

Consumer preferences and market orientation also played crucial roles. Enterprise A, targeting gourmet stores and engaging in agrotourism, saw rebranding through a renewed logo, label design, and brochures tailored to inform consumers as a strategy to enhance product appeal. Enterprise B, catering primarily to tourists and niche markets, feared that labeling would negatively influence consumer perceptions, leading to its cautious and selective application of labels. Subsequently, Enterprise B noticed that only some customers were concerned with FOPNL and are used to sugary foods while valuing sugar and salt as natural preservatives. Enterprise C, serving larger clients like supermarket chains, maintained its product formulations and was confident in its established consumer base, which showed minor sensitivity to FOPNL.

Value chain dynamics, including prices and access to inputs and market channels, influenced the duration and scope of responses to FOPNL. Enterprise A benefited from a vertically integrated supply chain, sourcing olives from its farm, which allowed for greater control over product quality and consistency. However, it might have limited, to a certain extent, the development of new products based on something other than olives as a strategy to respond to FOPNL. Enterprise B highlighted the high costs of sweeteners relative to sugar, which increased product costs and, therefore, the selling performance of reformulated foods with sweeteners, for which production was discontinued. Enterprise C's established supply chain with local farmers and long-term relationships with supermarkets provided access to information and training to comply with FOPNL and consumer base, reducing the need for significant production changes in response to FOPNL.

The level of support received from public and private institutions varied among the enterprises and was instrumental in guiding responses and compliance with FOPNL. Enterprises A and B benefited from public sector support. Enterprise A utilized MINSAL and Enterprise B resources, participating in workshops and courses to reduce targeted nutrient content organized by ACHIPIA, CECTA-USACH, SERCOTEC and INDAP. Enterprise C, in contrast, received support from the private sector from its primary customer, which provided direct technical guidance for FOPNL compliance. The availability and type of support—whether from public institutions or private sector partners—played a role in guiding responses and compliance with FOPNL.

Costs associated with the three companies' responses to FOPNL varied based on their strategies, the level of free public support they received, and consumer purchasing behaviors. Although this study wasn't designed to provide and extrapolate quantitative data on costs, it suggests that these costs can vary depending on these factors; for instance, simply adding a label on the front of the pack wasn't costly, while higher costs were associated with marketing and rebranding strategies and with developing new recipes with lower content of targeted nutrients requiring specialized technical support, the commercialization of some of this products required developing marketing strategies, and finally, the uptake by consumers.

The identified factors influencing MSME's responses to FOPNL are of greater scope than the tailored public support provided during the period of time this study was undertaken (Figure 13). Public support specifically designed to enhance MSME responses to FOPNL concentrated on raising awareness of the requirements of Law 20606 and on how to calculate

the nutrient content of foods to apply the front-of-pack nutrition labels, providing training and technical information on how to comply with labeling requirements to key stakeholders and smaller-sized companies, through manuals and information sessions.

Current awareness-raising initiatives and technical support to promote compliance with FOPNL hold scaling-up potential as a continuous effort. Out of 17,948 smaller-sized food processing enterprises, fewer than 11 per cent enrolled in the online course from SERCOTEC, and less than 60 per cent of those entrepreneurs finalized the module. Likewise, ACHIPIA and SEREMIS of Agriculture training reached around 3.5 per cent of the total food processing MSMEs. Despite participating in such trainings, MSMEs reported challenges in continuously applying the labels to different products, as it requires specialized skills, highlighting the importance of continuously mobilizing qualified professionals and advisory services. Specific training modules on Law 20606 could be provided within other programs aimed at MSMEs, as discussed in section 5.1.5. Entrepreneurs also question the use of U.S. FDA food composition tables, finding them hard to interpret and not reflective of Chilean ingredients. They suggest using nutrition analyses for more accurate labelling but recognize that this could impose additional costs on MSMEs, thus pointing to the need for public action to develop a more comprehensive Chilean food composition table.

To optimally address the identified factors influencing MSME's responses to FOPNL, options of product reformulation and communicating with consumers may need to be factored into MSMEs business plans, which may need to consider positioning existing and newly developed products along marketing strategies, including entering new market segments, which can value producers' efforts in reformulation. As observed in the case study, front-of-pack nutrition labelling requirements for formally operating smaller-sized food processing companies may bring implications beyond compliance, such as product identity, access to specific markets, consumer preferences and responses to labelled products and reformulated options, including consumer`s price sensitivity.

After introducing front-of-package labels, entrepreneurs responded strategically to the regulation to protect their markets. Enterprise A invested in nutritional analyses and strengthened branding to counteract the impact of "High in sodium" labels on a product where sodium cannot be easily reduced or replaced. Company B stated that "High in" labels do not affect sales, but noted they received public support to develop more expensive alternatives whose production was then discontinued that sell less than sugary products. Public policies on food education to help consumers better understand labels, nutrition tables, and dietary guidelines can enhance companies' communication with consumers. As Entrepreneur B noted, many customers still prefer sugary products. All three companies also emphasized using sugar and sodium as natural, low-cost preservatives.

The support provided to Company B free of cost was part of a pilot project aimed at helping MSMEs benefit from reformulating and marketing artisanal food products, typically high in salt and sugar, such as processed meats, jams, and cheese. However, the large number of food producers who lack sanitary licenses and operate informally limited the project's reach. Two regions were excluded from the project due to the requirement for sanitary-certified, fiscally registered small businesses. Secondary sources confirmed high levels of informality in the smaller-sized food processing subsector.

In a highly informal, smaller-sized food processing subsector, where many businesses lack standardized processes, FOPNL compliance may be a secondary concern. Effective compliance

can only occur when fiscal formalization enables monitoring, sanitary licensing minimizes food safety risks, and standardized production ensures consistency in nutrition labeling. The absence of registration and sanitary certification raises doubts about product quality, nutrient composition, and safety. Even among registered, sanitary licensed micro and small entrepreneurs, the lack of standardized recipes and processes leads to variations in product nutrient composition, affecting the accuracy of nutrition labels and front-of-package information.

Comprehensive support to enhance smaller-sized food processing companies' responses to FOPNL can be grounded in the extensive Chilean policy and institutions framework supporting MSMEs. Addressing limiting and enabling factors for MSMEs› adaptation to FOPNL requires incorporating tailored initiatives to address these factors into existing frameworks and adopting a multi-level, multi-institutional approach that coordinates efforts and resources and allocates funding for advisory and subnational services. Table 16 summarizes points of attention to policies and institutions.

Previous and ongoing initiatives offer insights for informing such efforts. For instance, past programs focused on securing sanitary licenses and guiding entrepreneurs toward formalization, such as the collaboration between the Ministry of Health (MINSAL) and the "Sabores del Campo" program. This initiative addressed food safety through sanitary certification and production audits, as well as business development through market research and commercialization support. These experiences highlight the potential benefits of combining food safety and business development strategies with initiatives to enhance MSME's responses to FOPNL, enabling them to meet regulatory standards and remain competitive.

The phased implementation of Law 20606 and subsequent outreach efforts by the Ministry of Health and Agriculture demonstrate the importance of multi-sectoral collaboration. Regional workshops and media campaigns were implemented to raise awareness of labeling requirements and offer training on nutrient calculation and label application. This decentralized approach, supported by additional resources allocated to local services, may serve as a model for strengthening MSMEs compliance through localized support and capacity building.

In addition, pilot projects led by ACHIPIA, INDAP, and Transforma Alimentos illustrate how public-private collaboration can facilitate product reformulation. These projects, aimed at reducing targeted nutrients while maintaining artisanal production methods, provided technological guidance and supported the adoption of Good Manufacturing Practices. Further scaling of these efforts and expanded training on cost analysis and marketing strategies could improve MSMEs' ability to respond to FOPNL regulations and capitalize on reformulation as a market strategy. Expanding such targeted initiatives, combining technical expertise from research and food technology institutions with advisory services, could contribute to more widespread MSMEs participation and long-term compliance across diverse food products and regions.

Given the significant role of MSMEs in Chile's food processing subsector—operating across diverse areas of expertise, from dairy and meat to fruit preservation, and often utilizing artisanal methods in varied geographical regions—addressing nutrition labeling requires more than just support for FOPNL compliance. It is essential to provide enhanced access to product-specific technical expertise, reformulation technologies, training, and financing aimed at optimizing responses to FOPNL. Comprehensive support in these areas will better equip MSMEs to handle FOPNL while preserving their unique production methods and enhancing both livelihoods and economic contributions.

MSMEs constitute 81.9 per cent of Chile's formalized food processing companies and employ nearly a third of the sector's workforce, with micro-enterprises alone comprising 60.6 per cent of all food processors. However, MSME's contribution to overall sales accounts for 8.6 per cent of the sector's total revenue. This revenue disparity reflects constraints, where micro-enterprises generate 1.0 per cent of the subsector's sales despite their large numbers, and medium enterprises, though better off, still contribute only 3.3 per cent. The predominance of low-revenue activities, especially among micro-enterprises, further underscores limitations that prevent these companies from enhancing productivity, scaling or entering high-value markets.

TABLE 16. Points of attention for policies and institutions

Areas of Support	Tailored Initiatives for Policy and Institutions
Investments and costs for label redesign, development of reformulated products and related acceptability tests, market research, business plans, marketing and commercialization strategies	• Broaden credit to smaller-sized enterprises with lines of credit for food development or reformulation, label redesign, and related business and marketing planning and development. • Support access to financial services for food development and reformulation, label redesign, business and marketing planning and development. • Programs of technical support for food development or reformulation, business and marketing planning and development, i.e. access to technical expertise and tailored services from business and food technology institutions. • Support programs for access to consultancy and advisory services in business, marketing planning and development and food reformulation.
Nutrition labeling compliance requires technical knowledge and skills continuously applied to newly developed foods	• Programs of qualification and training for food technicians, food professionals and label developers. • Support programs for technical assistance to smaller-sized enterprises to access consultancy/services of packaging design and nutrition labeling. • Expand coverage of training for micro and small-sized entrepreneurs on FOPNL. • Enhance awareness raising initiatives on FOPNL and training advertisement targeting MSMEs in regional and national media, including social media.
Food composition tables not adapted to national diverse foods are not easy to use when calculating nutrient content of food products	• When necessary, provide financial or technical support to carry out nutrient content calculations, or food analyses, especially related to FOPNL. • Support programs to smaller-sized enterprises to access consultancy and services. • Develop and enhance national food composition tables.
Lack of standardized production processes and recipes leads to inconsistent nutrient content of food products, thus compromising consistency and reliability of nutrition labeling	• Support programs to smaller-sized enterprises to access consultancy and services to enhance standardized food processing and adoption of Good Manufacturing Practices.
Low level of fiscal formalization and access to advisory services for comprehensive business development	• Promote and invest in local and regional arrangements among government, universities, food technology institutions, and service providers to support formalization and comprehensive business development, including sanitary licensing, packaging, nutrition labeling, and innovation.
Lack of sanitary licensing and compliance compromise food safety and weaken reliable nutrition labeling	• Enhance investments and specialized support for MSMEs compliance with sanitary requirements and reduce barriers for sanitary licensing.

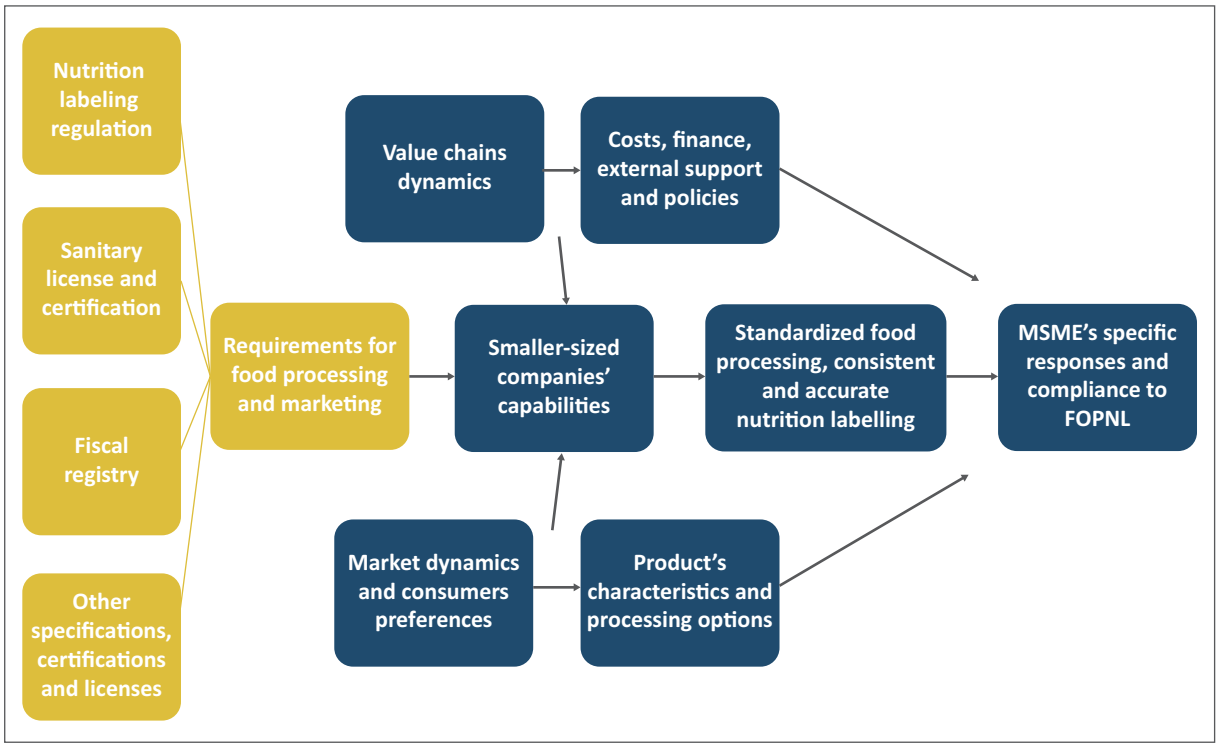
Source: Authors' elaboration.

Additionally, MSMEs are critical employers, with nearly 1/3 (one-third) of the food processing workforce, underscoring their importance in job creation, particularly for women. Women make up 50.4 per cent of the labour force in MSMEs, with 50.5 per cent of dependent employees and 49.9 per cent of independent contractors being female. However, significant challenges are brought by the high informality rates, especially among micro-enterprises. Informality is a barrier to access to credit, formal markets, and growth opportunities, impacting their economic stability and working conditions. Further addressing these challenges could enhance MSMEs' contributions to employment, gender equity, and economic growth in the food processing subsector.

9 FINAL SECTION

The responses of micro and small-sized enterprises (MSMEs) to Front-of-Pack Nutrition Labeling (FOPNL) can be shaped by a complex interplay of factors. This study identified and categorized these into key domains: all requirements and specifications for food processing and marketing; smaller-sized companies' capabilities; compliance with requirements resulting in standardized food processing and consistent and accurate nutrition labeling; value chain dynamics; consumer preferences and market dynamics; characteristics and processing options of food products; costs, finance and specialized support from advisory services, policies and institutions (Figure 13).

FIGURE 13. Conceptual model: interplay of factors shaping the responses of micro, small and medium-sized enterprises (MSMEs) to Front-of-Pack Nutrition Labeling (FOPNL)



Source: Authors' elaboration.

Implementing Law 20.606 is an ongoing process for MSMEs, particularly micro and small-sized enterprises, compared to larger companies that have been navigating these regulations since 2016. While larger enterprises have reformulated many popular food products (Barahona et al., 2020), smaller enterprises are still developing responses guided by evolving consumer preferences and supportive policies, regulatory, business and market conditions. The additional time granted to small and micro enterprises and the awareness-raising and training initiatives for compliance with FOPNL are supportive of these companies. However, as discussed, FOPNL may bring implications beyond compliance, such as product identity, access to specific markets, investments needs, additional costs, marketing and consumer preferences towards labeled or reformulated products.

This study identifies factors that can either limit or foster MSMEs' responses to and compliance with FOPNL and provides insights into institutional entry points for enhanced policy support. Future research is crucial to developing a more comprehensive understanding of the potential benefits of such support. It should involve a representative sample of smaller-sized enterprises to estimate how many enterprises need specific types of support depending on the company-specific responses to FOPNL and the associated costs and benefits. Additionally, conducting policy evaluations will be essential to assess the impact of FOP nutrition labels on consumer food preferences towards foods commonly produced by smaller-sized food processing enterprises, which can inform these food companies' responses to consumers' preferences. Studies indicate that Law 20.606 has influenced consumers' purchasing decisions (Crovetto et al., 2020).

10 REFERENCES

Barahona, N., Otero, C., Otero, S., & Kim, J. (2020). Equilibrium Effects of Food Labeling Policies. Equilibrium Effects of Food Labeling Policies. Available at SSRN: https://ssrn.com/abstract=3698473 or http://dx.doi.org/10.2139/ssrn.3698473.

Berdegué, J. & López, D. (2018). Mediana agricultura y agricultura familiar en Chile hacia el año 2030. In A. Apey, D. Barrera, & T. Rivas (Eds.), *Agricultura chilena: Reflexiones y Desafíos al 2030* (pp. 179-202). ODEPA.

Boza, S., Mora, M., Núñez, A., Espinoza, M., & Orellana, K. (2022). Exploring the attitudes and strategies of peri-urban vegetable growers in the Santiago Metropolitan Region of Chile. *Agricultural and Resource Economics, 22*(1): 53-67. https://doi.org/10.7201/earn.2022.01.03

Boza, S., Polanco, R., & Espinoza, M. (2019). Nutritional Regulation and International Trade in APEC Economies: The New Chilean Food Labeling Law. *Asian Journal of WTO & International Health Law and Policy, 14*(1): 73-113. http://dx.doi.org/10.2139/ssrn.3362184.

Boza, S., Cortés, M., Guzmán, F. (2015). Characterization of agricultural smallholder beneficiaries of local development programs in the Metropolitan Region, Chile. *Idesia, 33*(1): 135-142. http://dx.doi.org/10.4067/S0718-34292015000100014.

Carrasco, E. (2020, September 14). *"Tu Empresa en Un Día" permitirá hacer inicio de actividades y abrir cuenta bancaria*. MINECON. https://www.economia.gob.cl/2020/09/14/tu-empresa-en-un-dia-permitira-hacer-inicio-de-actividades-y-abrir-cuenta-bancaria.htm .

Clio Dinámica Consulting. (2018). *Informe final de consultoría: Evaluación de resultados y diseño de una evaluación de impacto del instrumento "Capital Semilla"*. https://www.economia.gob.cl/wp-content/uploads/2018/04/INFORME-FINAL-CONSOLIDADO-SEMILLA-29-3.pdf.

Corvalán, C., Correa, T., Reyes, M., & Paraje, G. (2021). *Impacto de la ley chilena de etiquetado en el sector productivo alimentario*. FAO and INTA. https://doi.org/10.4060/cb3298es.

Crosbie, E., Gomes, F. S., Olvera, J., Rincón-Gallardo Patiño, S., Hoeper, S., & Carriedo, A. (2023). A policy study on front–of–pack nutrition labeling in the Americas: emerging developments and outcomes. The Lancet Regional Health - Americas, 18. https://doi.org/10.1016/j.lana.2022.100400.

Crovetto, M., Acosta, M., & Rocco, Y. (2020). Ley 20.606: Efectos en el conocimiento de etiquetado nutricional en consumidores de un supermercado en Valparaíso de Chile: estudio descriptivo, cuanticualitativo, antes y después de 5 meses de la implementación de la ley. *Spanish Journal of Human Nutrition and Dietetics, 24*(4): 311-323. https://doi.org/10.14306/renhyd.24.4.979 .

Davcik, N. S., Cardinali, S., Sharma, P., & Cedrola, E. (2021). Exploring the role of international R&D activities in the impact of technological and marketing capabilities on SMEs' performance. Journal of Business Research, 128, 650–660. https://doi.org/10.1016/j.jbusres.2020.04.042

DIPOL. (2018). *Informe de evaluación de la implementación de la Ley sobre Composición Nutricional de los Alimentos y su Publicidad*. https://www.minsal.cl/wp-content/uploads/2018/05/Informe-Implementaci%C3%B3n-Ley-20606-febrero-18-1.pdf.

DIPOL. (2017, June). *Informe de evaluación de la implementación de la Ley sobre Composición Nutricional de los Alimentos y su Publicidad*. https://www.minsal.cl/wp-content/uploads/2017/05/Informe-Implementaci%C3%B3n-Ley-20606-junio-2017-PDF.pdf.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. Qualitative Inquiry, 12(2), 219–245. https://doi.org/10.1177/1077800405284363.

Food and Agriculture Organization of the United Nations (FAO), Pan American Health Organization (PAHO). Approval of a New Food Act in Chile: Process summary. Entry into force: June 2016. Santiago de Chile 2017;25.

FAO, PAHO & UNICEF. (2023). Front-of-pack nutrition labelling in Latin America and the Caribbean – Guidance note. Santiago. https://doi.org/10.4060/cc1545en

INE. (2021). *Tamaño UPA Región Comuna. VIII Censo Agropecuario y Forestal 2020-2021*. https://www.ine.gob.cl/estadisticas/economia/agricultura-agroindustria-y-pesca/censos-agropecuarios.

JUNAEB. (2022). *Informe Mapa nutricional 2021*. https://www.junaeb.cl/wp-content/uploads/2022/10/INFORME-MAPA-NUTRICIONAL-2021_FINAL.pdf.

MINECON. (2020). *Informe de resultados: la informalidad del microemprendimiento en Chile. Sexta Encuesta de Microemprendimiento*. https://www.economia.gob.cl/wp-content/uploads/2020/03/Informe-Resultados-Informalidad-EME-6.pdf.

MINSAL. (2017). *Encuesta Nacional de Salud 2016-2017. Primeros resultados*. https://www.minsal.cl/wp-content/uploads/2017/11/ENS-2016-17_PRIMEROS-RESULTADOS.pdf.

MINSAL. (2016, June 23). *Ley de Alimentos – Nuevo etiquetado de alimentos*. https://www.minsal.cl/ley-de-alimentos-nuevo-etiquetado-de-alimentos/.

Michael E, P. (2018). Competitive Advantage : Creating and Sustaining Superior Performance. In The Free Pres (Issue 2).

Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. International Journal of Production Economics, 135(1), 514–522. https://doi.org/10.1016/j.ijpe.2011.09.001.

Rodríguez-Auad, T., & Campero, T. (2020). Políticas e instituciones de fomento productivo para las mipymes en Chile. In M. Dini & G. Stumpo (Eds.), MIPYMES en América Latina: Un frágil desempeño y nuevos desafíos para las políticas de fomento (pp. 135-200). CEPAL.

Sáez, B. (2020). Emprendimiento y subsistencia: Radiografía a los microemprendimientos en Chile. Exploración de microdatos de la Sexta Encuesta Nacional de Microemprendimiento (EME). Fundación Sol. https://fundacionsol.cl/cl_luzit_herramientas/static/wp-content/uploads/2020/06/Microemprendimiento-y-subsistencia-2019.pdf.

SERCOTEC. (2022). Formación Empresarial. https://www.sercotec.cl/formacion-empresarial/.

SII. (2022, November). Estadísticas de Empresas por Actividad económica. https://www.sii.cl/sobre_el_sii/estadisticas_de_empresas.html.

Stanley, F., & John, C. (1994). Does competitive environment moderate the market orientation-performance relationship ? Journal of Marketing, 58(1), 46–55.

Storey, D. J. (2022). Understanding the small business sector. In Routledge Library Editions: Small Business (Vol. 17). https://doi.org/10.4324/9781315544335.

Yin, R. K. (2014). Case Study Research: Design and Methods (Applied Social Research Methods).

11 ANNEX

In the following table there is a list of additional resources on support documents mentioned in the document.

Resource	Online access
Manual of Nutritional Labeling of Foods	https://drive.google.com/file/d/1gtK5JJL-S6YlSGrpuvb4ihVX-rOUE-ix/view?usp=sharing
Technical guide for the Sanitary Resolution obtention and pre-requisites programs for food facilities owned by small and medium-sized farmers	https://drive.google.com/file/d/1M8l_2HWatqA6CHgpHcC7ND54Eok0UYxL/view?usp=sharing

ipcid@ipea.gov.br ▪ www.ipea.gov.br