

Article

Segmentation of Consumer Preferences for Vegetables Produced in Areas Depressed by Drought

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Abstract: The megadrought in Chile's north and central zones has impacted the horticultural production of family farming. One way to mitigate these effects is by adding value to vegetables. However, no studies show the main attributes consumers value of vegetables produced in the megadrought zone. The study's objective was to evaluate consumer preferences and identify segments based on the extrinsic attributes of vegetables grown in areas depressed by drought. We surveyed 946 vegetable buyers from the Antofagasta, Valparaíso, and Maule regions. Through the conjoint analysis technique, we identified that the main attributes preferred by consumers were presentation (45.3%) and type of vegetables (21.8%), followed by labeling (15.9%), producers (10.3%), and origin (6.7%). The cluster analysis revealed the existence of three segments. The largest segment is motivated by the way vegetables are presented (49.7%), followed by a second segment that values multi-attributes (31.9%) and a smaller segment that is interested in labeling (18.4%). These findings can help position these products in the market and raise awareness of family farming and the economic and production problems that they currently face.

Keywords: family farm; extrinsic attributes; drought; vegetables; preferences



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1. Introduction

The consumption of vegetables is beneficial for health due to non-communicable-disease-preventing effects [1]. WHO/FAO [2] recommends the intake of a minimum of 400 g of fruit and vegetables per day to prevent chronic diseases. In Chile, however, there is inadequate consumption of fruit and vegetables similar to other countries such as Canada, Brazil, and USA [3–5]. For that reason, health authorities in Chile have attempted to reverse the low consumption of vegetables through the National Food and Nutrition Policy [6]. This policy is directly associated with consumer value of the vegetables commercialized in different sale points.

On the other hand, vegetable production in Chile is around 87,751 Ha, and 74% is in Chile's central zone (Coquimbo and Maule regions) in which the main products are corn (13%), lettuce (8%), and tomato (7%) [7,8]. Vegetable production is labor-intensive, and family farming plays a relevant role. In Chile, close to 260,000 farms represent family farming; approximately 90% of the country's productivity units represent 33% of farm salary, which increases to 60% when considering self-employment [9]. Although family

farming is relevant in terms of farms, cultivated areas, and employment, access to markets is the main barrier to family farming [10]. Because the activity just represents 22% of the national agricultural production, which exposes a sizeable productivity gap. Additionally, it is necessary to review the existing programs to locate the trade of family farms as a central point [11,12]

Additionally, a megadrought (an uninterrupted sequence of dry years) has occurred in Chile's central zone since 2010 because of climate change. Annual rainfall deficits from 25 to 45 percent have affected Chile's central zone [13]. This megadrought has adverse effects on water availability, vegetation, and forest fires that have scaled into social and economic impacts [14]. Therefore, drought mitigation actions and policies are necessary to overcome their adverse effects [15].

Previous work shows us that the lack of access to markets plus drought in the central zone affects family farms, decreasing vegetable production and returns to farmers, leading to older farmers retiring and not being replaced, increasing the urban sprawl. Thus, how can we mitigate these negative factors? The scientific literature shows us that value-added diversification strategy supports the sustainability of family farms, which can be translated into more employment, inversions, and better use of natural resources [16–19].

Based on the microeconomic theory, consumers attempt to maximize utility in some way or another. In this maximization assumption, consumers choose the main attributes and characteristics they are looking for. Different studies have highlighted the importance of identifying the food products' main attributes to propose a value-added strategy. In that sense, it is essential to consider different products since people prefer certain vegetables over others. For example, tomatoes and lettuces as a base of salads have been studied in different latitudes [20,21]. Other external attributes such as labels on produce, vegetables being grown locally, and presentation format have also been considered in the scientific literature [22,23]. However, no studies have been conducted that demonstrate the main external attributes consumers value of the vegetables produced in the megadrought zone. Thus, this study's objective was to assess consumer preference for vegetables grown in areas depressed by drought. Furthermore, we describe differences across consumer segments using data collected in Chile's north and central areas as a case study for countries with drought problems.

2. Literature Review

2.1. The Choice of Vegetables by Consumers

Different factors can determine food choice. Chen and Antonelli [24] recently proposed a conceptual food choice model from a literature review. They identified three main factors (food-related features, individual differences, and society-related features) that explain food choice. The choice of vegetables does not escape this classification. Different studies of vegetable consumption have identified intrinsic and extrinsic attributes as components of the perceived quality from a consumer perspective [25–29]. All these dimensions are food-related features. In this context, the intrinsic attributes can be defined as the product's physical composition and cannot be altered without changing its nature (flavor, color, size, and aroma), while the extrinsic attributes are outside the product, and they differ from the product itself but are strongly associated with it (price, package, labels, certifications, brand).

Vegetable choices based on attributes can be different for each consumer. There are consumers oriented towards intrinsic characteristics, such as freshness [30], flavor, firmness [31], and sensory quality signals [32]. At the same time, other consumers are oriented towards extrinsic cues such as food safety labels on vegetables, domestic producers [33], brand, and origin [34]. However, we also find consumers who pay attention to attributes such as origin, seasonality, and freshness [35,36] and are price-sensitive, extrinsic-sensitive, and intrinsic-sensitive to the attributes [21]. Therefore, the literature is not conclusive regarding what attributes (extrinsic or intrinsic, or both) are more relevant vegetable preference of consumers.

The food choice model proposes that consumer preferences are part of the factor of individual differences. From economic and behavioral decision theories, the consumer preference can be interpreted as the preference for food A over food B, given the higher utility of food A to the decision-maker [37]. In the case of vegetables, from the 1990s to present, intrinsic and/or extrinsic attributes have been used as inputs to determine the preferences of vegetable consumers. For example, van der Pol et al. [38] found that quality as an extrinsic attribute was the main attribute for consumers of fruit and vegetables. However, if the evaluation of the attributes is made with a specific vegetable, the tendency is a mix of intrinsic and extrinsic attributes. For example, in the case of carrot and cabbage, the price, origin, freshness, size, color, and shape were relevant [39], while for tomatoes, the variety was more important than origin denomination and price [40]. It is important to highlight that the mix of attributes may create added value for consumers. This was evidenced in research on tomato, strawberry, and sweet pepper for attributes such as flavor, health, nutritional value, and price [41].

The society-related features are the third factor of the food choice model. This category includes sociocultural factors, which may be evidenced through the vegetable consumer segmentation. Consumer segmentation is the classification of similar consumers in one or more characteristics [42]. In the broader context, the intrinsic and extrinsic attributes plus sociodemographic variables have been used to recognize different consumer groups of vegetables [43]. Nevertheless, we do not forget the theme associated with vegetable consumption. For example, four segments were identified by the motivation associated with the context of fruit and vegetable consumption [44]. In the case of food safety for tomatoes, three segments were differentiated. The first segment was price-oriented, followed by a food-safety-oriented segment and a moderate segment [20]. In the case of organic produce for emerging markets, a segment that perceives the ethical benefit to society of organic agriculture and a segment of family income were identified [45]. Therefore, the intrinsic and extrinsic attributes as part of segmentation analysis can be used to identify factors to add value to basic food such as vegetables.

2.2. The INDAP Role in Small- and Medium-Scale Farming

The regions considered in this paper comprise a high proportion of the rural population in Chile (55.5%). Most of them are small- and medium-scale farmers (SMSFs) relevant to any agricultural development strategy and competitive positioning. According to Calus and van Huylenbroeck [46], a definition of SMSF includes the following elements: Both business ownership and management control are in the hands of family members or close to it; the business and management control are transferred within the family through successive generations; most labor is provided by the head of the household and their family; the farmer and their family have provided an essential part of the capital, the family receives an important part of their income from agriculture; and the family lives on the farm.

In Chile, SMSF agriculture is a segment of the national economy that presents heterogeneous levels of integration into local markets and low direct participation in international markets. The National Institute for Agricultural Development (INDAP) is the main agency providing support to SMSFs. The INDAP role as an agent of change and transformation of smallholder agriculture seems well established and has a strong reputation among farmers and the community of professionals involved in the agricultural sector. The INDAP beneficiary profile is described in its Organic Law of 1993. It incorporates the changes that have occurred in most Chilean emerging families farming in recent decades due to the typical changes of a developing society and the implementation of public policies in the agricultural sector. The criteria to establish the level of beneficiaries of an INDAP program follow mainly socioeconomic guidelines. Among these are the farm size which follows the combination of four variables applicable to the family production unit and/or its owner: (a) working directly on the land, whatever their tenure, (b) growing an area no greater than 12 hectares of basic irrigation, (c) holding assets in an amount not exceeding the 3500 UF

(Unidad de Fomento or UF is a measure based on the indexed change in the Consumer Price Index. Its value on 12 May 2022 was USD 37.8), and (d) the family income comes primarily from the farm. Moreover, INDAP considers that the natural and physical capital of subsistence farming cannot achieve a minimum income, defined as approximately USD 2200 annually.

Overall, it is clear that the definition of SMSF evolves concepts, definitions, and experiences based not only on the international conditions but also on the country's situation that allows the use of the potential economic, technological, and production capabilities that these farmers have.

3. Materials and Methods

3.1. Sample and Procedure

This study was designed to be descriptive and was conducted in the Antofagasta, Valparaíso, and Maule regions of Chile. The study used a convenience sample of vegetable purchasers. A total of 946 selected consumers over 18 years old (legal age) were interviewed using the mall intercept technique. The survey data were collected by interviews conducted in public places close to banks, stores, and supermarkets. Interviews were conducted in January–May 2019. Before data collection, the questionnaire had been previously validated through a preliminary test with 10 percent of the sample, using the same method of addressing the participants as in the final survey. The problems detected were corrected to apply the final version of the questionnaire and interview procedure. The surveyors explained the study's objectives to interviewees and assured them that their answers would be confidential.

3.2. Questionnaire

A questionnaire with closed-ended questions was used to collect general information regarding vegetables grown in megadrought zones, such as preferred vegetables, consumption frequency, and point of purchase. The questionnaire included classification questions to establish background information about gender, age, education, and occupation of the head of household. To evaluate the preference for vegetables grown in the megadrought zones, a conjoint analysis (CA) was performed [47]. Five levels were defined for vegetables: lettuce, cucumber, onion, corn, and tomato [20,30,48,49]. It is important to consider that these vegetables are also produced in the research area. INDAP is the Chilean state organization supporting farm families. In that context, INDAP beneficiary and non-beneficiary were the two levels defined for producers as a second attribute. Two levels were defined for the label: farm hand label and no label [20,50]. Concerning the origin attribute, two levels were defined: national and local origin of the production [51,52]. The last attribute assessed was the presentation of the vegetables. The levels were cut vegetables and whole vegetables [53,54]. Based on the attributes and levels described above, the full factorial design contains $5 \times 2 \times 2 \times 2 \times 2 = 80$ combinations of attribute levels. Subsequently, and to reduce the number of product profiles to be evaluated by interviewees, a fractional factorial design was generated using the orthoplan procedure in SPSS version 27. Eighteen different stimuli were obtained and presented to the sample respondents (see Table 1). Each interviewee had to score each profile on a 1–7 scale, where 1 corresponds to the least preferred product and 7 to the most preferred one.

3.3. Statistical Analysis

The data collected were analyzed using two types of multivariate analysis. We applied a CA to determine the relative importance that consumers attributed to the levels of attributes defined for the study and the partial utility score. Once partial utility was determined with CA, they were segmented using cluster analysis: First, we applied a hierarchical agglomerative cluster analysis, using Ward's method followed by a k-media for the stability of the cluster and a one-way ANOVA. The number of clusters was achieved based on the R^2 obtained, and a strong increase was produced in the cubic criterion of

clustering and pseudo-F values. The significant variables were separated using Dunnett's T3 multiple comparison procedures to determine the validity of the cluster, given that the variances were not homogeneous. Finally, contingency tables were built with the frequency of vegetable consumption, stores to purchase vegetables, and sociodemographic variables to describe the segments. The entire analysis was carried out using SPSS version 27.

Table 1. Full factorial design presented to consumers.

Profile	Type of Vegetable	Producer	Label	Origin	Presentation
1	Lettuce	INDAP beneficiary	Farmhand label	National	Cut vegetables
2	Lettuce	Non-beneficiary	Without label	Local	Whole vegetables
3	Cucumber	INDAP beneficiary	Farmhand label	Local	Cut vegetables
4	Onion	Non-beneficiary	Without label	National	Cut vegetables
5	Cucumber	Non-beneficiary	Without label	National	Whole vegetables
6	Lettuce	Non-beneficiary	Without label	National	Cut vegetables
7	Corn	Non-beneficiary	Without label	Local	Whole vegetables
8	Tomato	INDAP beneficiary	Without label	National	Whole vegetables
9	Onion	INDAP beneficiary	Without label	Local	Whole vegetables
10	Tomato	INDAP beneficiary	Farmhand label	National	Whole vegetables
11	Cucumber	INDAP beneficiary	Without label	Local	Cut vegetables
12	Cucumber	Non-beneficiary	Without label	National	Whole vegetables
13	Corn	INDAP beneficiary	Without label	National	Cut vegetables
14	Lettuce	INDAP beneficiary	Farmhand label	Local	Whole vegetables
15	Tomato	Non-beneficiary	Without label	Local	Cut vegetables
16	Tomato	Non-beneficiary	Without label	Local	Whole vegetables
17	Onion	INDAP beneficiary	Without label	Local	Cut vegetables
18	Lettuce	Non-beneficiary	Without label	National	Whole vegetables

4. Results

Consumer preference was determined for CA. The main vegetable attributes preferred by consumers were as follows: The most important was the presentation (45.3 percent), followed by the type of vegetable (21.8 percent), label (15.9 percent), producer (10.3 percent), and origin (6.7 percent). Consumers showed a general preference for cut vegetables (positive utility) and rejected the whole vegetable as a presentation format. The results reveal a preference for corn and lettuce and a lower preference for onion, tomatoes, and cucumber. Furthermore, consumers showed a preference for vegetables with farmhand labels, and these vegetables are grown for INDAP beneficiaries nationally.

Three statistically significant ($p < 0.00$) consumer segments were identified through cluster analysis. This analysis was carried out using the importance and utility of type of vegetable, producer, label, origin, and presentation (Table 2). The consumer segments presented significant differences according to gender, age, socioeconomic status, family size, frequency of vegetable consumption, and point of vegetable sale ($p \leq 0.001$). The composition of each segment is shown in Table 3.

Group 1 represented 31.9 percent of the sample; for this segment, the type of vegetable was the main attribute compared to groups 3 and 2, respectively. The higher utility scores for vegetables in this group were corn and lettuce. However, the utility scores for corn were significantly lower than group 2. The second most valued attribute was the presentation of vegetables, significantly higher than in group 3 but lower than in group 2 ($p \leq 0.000$). In this regard, utility attributed to the cut vegetables by consumers was lower than in groups 2 and 3 ($p \leq 0.000$). It is worth noting that this group valued producers more than the two other groups ($p \leq 0.000$). In this regard, the producer beneficiary of INDAP scored significantly higher than in the other two groups ($p \leq 0.000$). This group valued the attribute label significantly higher than in group 2 but lower than in group 3 ($p \leq 0.000$). In addition, this group valued the attribute origin higher than groups 2 and 3 ($p \leq 0.000$). In this regard, the higher utility scores were for a national production of vegetables ($p \leq 0.000$). In percentage terms, this group contained the highest proportion of men in relation to the

two other groups ($p \leq 0.000$) and people aged lower than 35 years ($p \leq 0.000$). Group 1 contained the lowest middle-middle SES. This group had more participants from five or more members of households than the other two groups ($p \leq 0.000$). It is worth noting that the frequency of consumption of vegetables ranged from three times a week ($p \leq 0.000$), and this group preferred to purchase vegetables in vegetable and corner stores ($p \leq 0.000$). Given the characteristics set out above, this group was named “multi-attribute” consumers.

Table 2. Distribution and relative importance for the three clusters based on preferences towards attributes: vegetable, producer, label, origin, and presentation in the Antofagasta, Valparaíso, and Maule regions of Chile.

	Total Sample	Group 1 <i>n</i> = 302		Group 2 <i>n</i> = 470		Group 3 <i>n</i> = 174		F	<i>p</i>
<i>Relative importance (%)</i>									
Type of vegetable	21.80	32.73	a	12.96	c	25.83	b	166.4	0.000
Producer	10.30	20.10	a	4.45	c	8.33	b	128.2	0.000
Label	15.90	15.34	b	6.44	c	41.16	a	458.8	0.000
Origin	6.70	9.03	a	5.01	c	6.40	b	29.1	0.000
Presentation	45.30	22.80	b	71.14	a	18.27	c	589.0	0.000
<i>Utility values of attributes</i>									
Tomato	−0.15	−0.026	a	−0.202	b	−0.224	b	13.4	0.000
Lettuce	0.06	0.204	a	0.105	a	−0.289	b	32.3	0.000
Cucumber	−0.17	−0.228	b	−0.188	b	0.003	a	6.7	0.000
Onion	−0.06	−0.195	b	−0.118	b	0.326	a	31.8	0.000
Corn	0.31	0.245	b	0.404	a	0.185	b	6.5	0.000
INDAP beneficiary	0.19	0.402	a	0.152	b	−0.067	c	59.9	0.000
Non-beneficiary	−0.19	−0.402	c	−0.152	b	0.067	a	59.9	0.000
Farm hand label	0.30	0.067	b	0.068	b	1.336	a	468.2	0.000
Without label	−0.30	−0.067	a	−0.068	a	−1.336	b	468.2	0.000
National	0.10	0.043	b	0.153	a	0.041	b	14.1	0.000
Local	−0.10	−0.043	a	−0.153	b	−0.041	a	14.1	0.000
Cut vegetables	1.44	0.404	b	2.468	a	0.483	b	1609.3	0.000
Whole vegetables	−1.44	−0.404	a	−2.468	b	−0.483	a	1609.3	0.000

Different letters on the line indicate significant differences according to Dunnett’s T3 multiple comparison test ($p < 0.001$).

In group 2 (49.7 percent of the total sample), the presentation ranked first and significantly higher than the other two groups ($p \leq 0.000$). This group assigned a significantly higher positive utility to cut vegetables ($p \leq 0.000$). It contained the highest number of female consumers ($p \leq 0.000$) and the highest proportion of people over 55 years old. Furthermore, it contained the highest proportion of people with middle-low and low SES ($p \leq 0.000$). This group contained the highest proportion of households with one to two members compared to the other two groups ($p \leq 0.000$). It is worth noting that this group preferred to purchase vegetables in municipal fairs ($p \leq 0.000$). Furthermore, it proportionally contained people who consume vegetables daily ($p \leq 0.000$). This group was named “vegetable-presentation-oriented” consumers.

Group 3 represented 18.4% of the sample. The label was ranked first in this group and scored significantly higher than the other groups ($p \leq 0.000$). This group showed the highest level of preference for farmhand labels. It contained the highest proportion of people with high and middle-high SES ($p \leq 0.000$). Regarding household size, a higher proportion of participants were part of families of three to four members compared to the total sample ($p \leq 0.000$). This group eats vegetables at least three times a week or daily ($p \leq 0.000$). In addition, this group showed the highest proportion of consumers who purchase vegetables in supermarkets. Because of the characteristics set out above, this group was named “label-oriented consumers”.

Table 3. Characteristics with significant differences between the groups identified in cluster analysis in the Antofagasta, Valparaíso, and Maule regions of Chile.

Characteristics (%)	Group 1 <i>n</i> = 302	Group 2 <i>n</i> = 470	Group 3 <i>n</i> = 174
<i>Gender</i>		<i>p</i> = 0.000	
Male	33.1	20.6	26.2
Female	66.9	79.4	73.8
<i>Age</i>		<i>p</i> = 0.000	
<35 years old	48.0	31.9	42.5
35–54 years old	40.4	41.9	38.5
55 years or more	11.6	26.2	19.0
<i>Socioeconomic status (SES)</i>		<i>p</i> = 0.000	
High and middle-high	33.8	17.9	35.6
Middle-middle	29.2	30.0	35.6
Middle-low	29.1	37.2	25.9
Low	7.9	14.9	2.9
<i>Family size</i>		<i>p</i> = 0.530	
Family with 1–2 members	28.5	31.9	29.3
Family with 3–4 members	51.0	51.7	54.6
Family with 5 or more members	20.5	16.4	16.1
<i>Frequency of vegetable consumption</i>		<i>p</i> = 0.000	
Eat vegetables occasionally	8.3	4.0	5.7
Eat vegetables one time in a week	8.9	3.8	6.4
Eat vegetables three times in a week	30.5	27.7	29.3
Eat vegetables daily	52.3	64.5	58.6
<i>Where do you purchase fresh vegetables?</i>		<i>p</i> = 0.000	
Supermarkets	28.5	14.9	29.9
Corner stores	13.2	11.3	10.9
Municipal fairs	34.8	54.3	42.0
Vegetable stores	21.8	17.9	15.5
Other	1.7	1.6	1.7

5. Discussion

The megadrought in Chile due to climate change has reduced the productivity of the family farm, which has scaled towards social and economic adverse effects. In that context, the present study attempted to assess consumer preference for vegetables grown in areas depressed by drought. In addition, we segmented the consumer preferences based on the main attributes of vegetables grown in these depressed areas. We discuss the results of the models below.

The main results revealed that consumers prefer certain types of extrinsic attributes over others. In this study, the attributes “presentation” and “type of vegetable” were more important than “label”, “producer”, and “origin”. Three segments were identified based on the importance of the attributes studied and the consumer preference for vegetables produced in areas depressed by drought. The findings of this research revealed that 49.7 percent of the sample (vegetable-presentation-oriented segment) expresses a higher preference for vegetable presentation to the consumers. In this research, people preferred cut vegetables over whole vegetables, which reflects the tendency to consume minimally processed vegetables as a convenience product [55]. The cut vegetable is a way to add value to the products sold in this depressed area. In that sense, this finding is in line with previous research that found that the mix of different attributes contributes to the preference for fresh-cut vegetables [56] since the consumers prefer ready-to-eat products to preparing food themselves [57]. In addition, this segment with middle-low and low SES prefers to purchase vegetables in municipal fairs. This finding is in line with previous studies due to the low cost, availability, and other barriers to buying vegetables. [20,58]

The results also reveal the existence of a “multi-attribute” consumer segment (31.9 percent of the sample), who show a high preference for the type of vegetable followed by the extrinsic attributes of presentation, producer, label, and to a lesser extent origin. In relation

to the types of vegetables, the consumers preferred corn and lettuce over the rest of the vegetables assessed. Lettuce is a vegetable with high demand worldwide, and Chile is not an exception. According to the National Survey of Food Consumption [59], lettuce has a high rate of consumption among the Chilean population. On the other hand, surprisingly, consumers preferred corn because it can be frozen to add value. In that context, a recent study demonstrated that retrogradation of the starch in the case of corn is equivalent to dietary fiber, which can be beneficial for consumers [60,61]. This group also highlights the vegetable presentation as a vegetable-presentation-oriented segment. At a similar level, the multi-attribute segment highlights the producer attribute. In this context, consumers prefer vegetables produced by an INDAP beneficiary. This finding is in line with previous research on perceptions and attitudes of Chilean consumers towards products from family farming [62]. In this research, the authors concluded that consumers positively perceive rural products, which increases the possibility of marketing this type of product. In addition, in a study carried out in China, the certification of the family farm has had a significant impact on the marketing channels [63]. In that sense, being an INDAP beneficiary can be used as a credence attribute for vegetable preference of consumers. The origin of the production also is relevant in this group. Consumers preferred vegetables grown nationally over locally. The origin of food products has captured the attention of researchers in recent decades. Different studies have been carried out assessing the country of origin, ethnocentrism, and, more recently, local origin. The origin attribute of the vegetables is a quality cue used by consumers combined with other characteristics. This attribute influences consumer confidence reducing the risk of purchase [64]. Previous studies have shown the importance of the origin attribute. For example, consumers value local organic products in most federal states in Germany, and they accept paying premium prices for these [65]. In the case of fresh tomatoes in the South of Chile, the variety and origin were the most valued attributes [66]. Similar findings were reported previously in the Philippines for carrot and cabbage, in which price and origin were the main attributes [39]. Additionally, this segment with middle SES prefers to purchase vegetables in vegetable and corner stores, following the tendency of the vegetable consumers in developed countries [67].

A third segment (18.4% of the sample) was named “label-oriented consumers”. This potential market niche assigned higher importance to farmhand labels on the vegetables produced in the drought zone. The labels on food at the front of the package can be considered credence attributes, leading to consumer preference for vegetables grown in this depressed area. Food labels provide a visual and/or verbal representation of food attributes, requiring a cognitive effort to process and interpret the labels before a food choice [68]. Food labeling can affect consumer decision-making since it has been used as a regulatory tool or marketing strategy. Our results are in line with previous research which found that food labels on vegetables highlight specific characteristics, such as organic certification, safe vegetables, quality, origin, and sustainable production [20,69–73]. The label-oriented consumer segment is compounded by people with high SES who purchase vegetables mainly in supermarkets compared to the other groups. Supermarkets are recognized as modern markets where healthy lifestyles often start [74].

Sustainability is defined overall with a triple bottom line approach, which concentrates on the economic, social, and environmental growth of any organization [75]. In addition, sustainability from an agricultural perspective is defined as the ability of a crop production system to continuously produce food without environmental degradation [76]. Based on the main definition of sustainability and the sub-dimension of agriculture, our results are related to sustainability in the following ways. According to our results, corn and lettuce production must be higher than the other species assessed, since consumers preferred these vegetables. In that sense, the production system of the family farm for lettuce and corn can be sustainable, given that the INDAP beneficiaries receive technical assistance. The technical support must be oriented towards an efficient use of water for both species and other agronomic practices to achieve sustainability as a whole. In the case of corn, the

technician must identify varieties resistant to drought. In the case of lettuce, a greenhouse with efficient use of water can help to improve the production of this vegetable.

This study provides evidence that extrinsic attributes add value to the vegetables grown in areas depressed by drought. These results can help producers, stakeholders, and policy decision-makers to implement strategies and tactics of marketing to improve (a) the access to the market to the family farms, (b) differentiation of the vegetables grown in the drought area over the rest of the country, and (c) positioning of the farmhand label proposed by INDAP in the market.

Among the limitations of the study, it is worth noting that the sample is not representative of the population distribution of Chile. However, our study interviewed consumers in charge of buying vegetables for the household. In that context, most interviewees were women, similar to developed countries [77]. Despite the limitations of this research, it contributes to establishing the main attributes valued by consumers regarding the vegetables produced by family farms in the drought area.

Future research must consider the challenges of dynamic agri-food markets. These involve new changes in value chains [78]: differentiated food product markets, product differentiation through collective reputation, non-traditional procurement schemes, and vertical relationships. In this context, new spaces for analyses of marketing strategies in new contexts such as digital media [79], and mobile markets [80] are understudied in Latin America. Moreover, these are important issues in view of obesity prevention and vegetable consumption promotion in the region [81–83].

Additionally, the food supply is facing several recent challenges. The role of imports and stocks on domestic food price instability is important as domestic shortfalls in food production are likely to become more frequent given climate change scenarios [84]. The influence of COVID-19 on eating habits [85] and purchase decisions [86,87] is relevant for advancements in the research and policy arena.

6. Conclusions

The megadrought in Chile's north and central zones affects the family farm in charge of vegetable production. Therefore, applying marketing tactics and strategies can help mitigate the megadrought effects from the market point of view. In the entire area, there are at least three segments of vegetable consumers, named "vegetable-presentation-oriented", "multi-attribute consumer", and "label-oriented consumers", who value the extrinsic attributes of the vegetables differently. The main extrinsic attributes preferred by consumers were presentation and type of vegetables, followed by farmhand label, the vegetables produced by the beneficiary of INDAP, and origin of the production.

The success of positioning these attributes for consumers will not only depend on achieving consumer recognition in the marketplace but also on increasing consumer awareness of family farms that conserve the environment, culture, and agriculture in these depressed areas. Therefore, the government agencies must not only help from a technical point of view but must also help to develop marketing tools to position these products in the market.

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