PE7.45 Importance of Intrinsic Attributes on the Purchase of Beef Meat in Chile 425.00

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Abstract- The aim of this study was to evaluate the importance of intrinsic attributes on the purchase of beef, detect relations between the attributes and differentiate consumer segments in southern Chile. To do this, direct surveys were administered to 1,200 people in the Regions of Maule, Biobío and the Araucanía. Two dimensions were obtained that characterize the relations between the attributes (64.7% of the variance), which presented an overall high significance. Three segments were found with differences in gender, area of residence, age, family size, socioeconomic level and ethnic origin. The largest group (46.3%) values intrinsic attributes of quality and those related to health care, the second (34.2%) gives minor importance to organoleptic traits and the third segment (19.5%) places minor relevance on health care.

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I. INTRODUCTION

Products are conceived as a set of attributes, each one of which gives an indication that contributes to the formation of consumer preferences. Therefore, the quality of products is not a one-dimensional concept, but one which requires a multi-attribute approach [4]. The attributes can be divided into intrinsic, i.e. related to the physical aspects of the meat, and extrinsic, those related to the product but which physically do not form part of it [12]. It has been reported that the intrinsic attributes have a greater influence than the extrinsic when purchasing beef [8]. The intrinsic attributes evaluated most in the selection of meat are tenderness [1, 8, 11], freshness [2, 13], color [7, 8, 9], fat and cholesterol content [7, 10], presence of additives [13], nutritional value [3, 10], flavor [1, 8, 11], juiciness [8, 11] and scent [11]. Despite the promotion of beef exports in Chile, the domestic market is large and highly competitive, facing competition from both imported meat and domestic chicken and pork production. Knowing the consumer's opinion is a key factor in adding value to the meat and in understanding purchasing selections. Hence, the aim of this study was to evaluate the relative importance of intrinsic attributes in the purchase of beef, to detect relations between attributes and to distinguish consumer segments in southern Chile.

II. MATERIALS AND METHODS

A personal survey was administered to a sample of 400 people in the Region of Maule, 400 in Biobío and 400 in the Araucanía, Chile, who are responsible for meat purchases in their home. A questionnaire with closed questions was used to determine the frequency of beef consumption and to classify survey participants. The survey was applied between August and December 2008, once the questionnaire had been validated with a pilot test of 5% of the sample. In order to determine the importance of the attributes, a 3-level Likert scale was used [5] (3: very important, 2: important and 1: not important). The attributes evaluated were: flavor, juiciness, scent, color, tenderness, freshness, nutritional content, fat content, cholesterol content and absence of additives. The results were analyzed using descriptive statistics and then a factorial analysis of the principal components was used to determine those factors that explain the relations between the attributes [6]. The extraction of factors was done with eigenvalues greater than 1 and varimax rotation. Hierarchical clustering determined consumer segments, with Ward's method linking objects and the squared Euclidean distance measuring the similarity between them [6]. The number of clusters was obtained on the basis of the R2 obtained and from a strong increase produced in the Cubic Criterion of Clustering and

Pseudo-F values. In order to describe the segments, Pearson's chi-square test was applied to the discreet variables and an analysis of variance to the values of significance of the attributes. The variables whose analysis of variance resulted in significant differences ($p<0.001$) were subjected to the Tukey multiple comparison test. The SPSS 16.0 program for Windows was used.

III. RESULTS AND DISCUSSION

According to the valuation scale used, all the attributes evaluated could be classified as significant or very significant (averages over 2.3). Using a factorial analysis of the principal components, two dimensions were obtained that represent 64.7% of the accumulated variance (Table 1). The value of the KMO test of sampling adequacy was considered good and Bartlett's test of sphericity was significant (p £ 0.001) [6]. All the attributes correlated positively with their respective factors. The factors obtained are: Factor 1. Organoleptic traits: explains 45.79% of the variance, made up of the attributes flavor, juiciness, scent, color and tenderness. Factor 2. Health: factor explains 18.91% of the variance, composed of absence of additives, fat content, cholesterol content, nutritional content and freshness. Among the attributes of factor 1, the one of greatest importance was scent, which tallies with previous studies regarding the importance of this attribute in the quality of meat related to its freshness [11]. The importance given to the color explains the relevance of the appearance of the meat to consumer selection in agreement with studies conducted in developed countries that indicate that color is used as a freshness indicator [7, 9]. The results obtained confirm the importance of flavor [1, 8, 11] and juiciness [8, 11] in consumer preferences, aspects that will determine whether or not the consumption experience is pleasant. The relevance of tenderness corroborates study results in developed countries that show that the attribute of palatability in the meat is the most important and the primary determinant of quality [1, 8, 11]. Among the attributes of factor 2, the importance assigned to the absence of chemical additives, cholesterol and fat content tallies with investigations that report on consumer health concerns when purchasing beef [2, 3, 10]. The importance attributed to freshness agrees with the high valuation of this attribute in developed countries [2, 13], where freshness has been associated with the innocuousness of the product, constituting one of the main attributes of quality at the time of the purchase in stores, anticipating a pleasant experience during consumption [2]. The lower importance placed on nutritional content agrees with the results of studies in developed countries [3, 10] that attribute this seat of honor to consumers' high level of knowledge of the topic; however, in the case of this topic in the area covered in this study, this aspect will require further investigation. Using hierarchical clustering, three consumer segments were obtained with statistically significant differences ($p\leq0.001$) in the importance of the attributes (Table 2). Table 3 presents the sociodemographic traits with significant differences between the groups. No differences were found according to the frequency of beef consumption, education and occupation of the head of the household ($p>0.1$). Group 1. Beef consumers less concerned by attributes related to health: made up of 19.5% of the sample, who assigned the least importance to the attributes related to health care (factor 2). Within the organoleptic attributes, this group assigned the greatest importance to flavor and scent (Table 2). This group presented a greater proportion of men (38.0%), those under 35 years of age (19.7%), families with five or more (14.5%) and from socioeconomic group ABC1 (35.9%) (Table 3). Group 2. Beef consumers less concerned about organoleptic qualities: made up of 34.2% of the consumers. The people in this group assigned the least importance to the attributes of factor 1, significantly less than Groups 1 and 3. The importance assigned to the Factor 2 attributes was intermediate, except in the cases of fat content and freshness, where it did not differ from Group 1 (Table 2). This group had a higher presence of women (90.7%), 55 years or older (13.4%), families with three or four members (56.8%) and from the socioeconomic group C2 (49.0%) (Table 3). Group 3. Beef consumers less concerned about organoleptic qualities and those traits related to health: made up of 46.3% of the consumers who gave high importance to all the attributes evaluated (Table 2). This group was made up of a greater proportion of men (29.0%), of families with one or two members (37.1%), rural residents (16.2%), from socioeconomic group E (3.4%) and of Mapuche origin (1 (Table 3).

IV. CONCLUSIONS

When purchasing beef, consumers in the Regions of Maule, Biobío and the Araucanía, Chile assign high relevance to the product's intrinsic attributes. Using a factorial analysis of the principal components, it was possible to associate 10 intrinsic attributes in two dimensions corresponding to organoleptic traits and health. Three consumer segments were identified, with different valuation of the attributes and different demographic profiles as far as gender, area of residence, age, family size, socioeconomic level and ethnic origin. The largest group (46.3%) values attributes of organoleptic quality and those related to health care, the second (34.2%) gives minor importance to organoleptic traits and the third (19.5%) places minor relevance on health care.

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Table 1. Importance of intrinsic attributes in the purchase of beef and results of the factorial analysis. Maule, Biobío and Araucanía Regions, Chile. December 2008. Table 2. Importance of intrinsic attributes in the purchase of beef in the groups obtained through cluster analysis. Maule, Biobío and Araucanía Regions, Chile. December 2008. Table 3. Demographic characteristics with statistical differences between the groups obtained through the cluster analysis. Maule, Biobío and Araucanía Regions, Chile. December 2008.

Table 1. Importance of intrinsic attributes in the purchase of beef and results of the factorial analysis. Maule, Biobío and Araucanía Regions, Chile. December 2008.

Attribute	Total sample		Factor	
	Average	Standard deviation	Factor 1	Factor 2
Flavor	2.61	0.491	0.923	0.084
Juiciness	2.56	0.514	0.892	0.091
Scent	2.64	0.482	0.885	0.126
Color	2.54	0.545	0.821	0.184
Tenderness	2.51	0.549	0.656	0.317
Absence of additives	2.55	0.587	0,169	0.788
Fat content	2.64	0.529	0.103	0.723
Cholesterol content	2.55	0.621	-0.053	0.711
Nutritional content	2.38	0.632	0.236	0.670
Freshness	2.62	0.518	0.410	0.636
Variance by factor (%)			45.79	18.91
Accumulated variance (%)			45.79	64.70

Kaiser-Meyer-Olkin measure of sampling adequacy = 0.847. Bartlett's test of sphericity: Approximate Chi^2 = 6,646.138; gl = 45; Sig. = 0.000. Method of extraction: Principal components analysis. Method of rotation: Varimax normalization with Kaiser. The rotation has converged in six iterations.

Table 2. Importance of intrinsic attributes in the purchase of beef in the groups obtained through cluster analysis. Maule, Biobío and Araucanía Regions, Chile. December 2008.

Attribute	Group 1 (n = 234)	Group 2 (n = 410)	Group 3 (n = 556)	F	Sig.[1]
Flavor	2.88 a	2.01 b	2.94 a	2065.3 *	0.000
Juiciness	2.76 b	2.00 c	2.90 a	1023.7 *	0.000
Scent	2.93 a	2.03 b	2.98 a	3531.9 *	0.000
Color	2.58 b	1.99 c	2.93 a	841.1 *	0.000
Tenderness	2.52 b	2.06 c	2.84 a	396.1 *	0.000
Absence of additives	2.13 c	2.33 b	2.89 a	258.5 *	0.000
Fat content	2.43 b	2.47 b	2.84 a	92.4 *	0.000
Nutritional content	1.88 c	2.19 b	2.73 a	248.6 *	0.000
Cholesterol content	2.20 c	2.48 b	2.76 a	81.324 *	0.000
Freshness	2.28 b	2.31 b	2.99 a	469.7 *	0.000

* Significance at 0.1%. Different letters indicate statistically significant differences according to the Tukey test of multiple comparisons ($p \leq 0.001$). [1]: Statistical significance.

Table 3. Demographic characteristics with statistical differences between the groups obtained through the cluster analysis. Maule, Biobío and Araucanía Regions, Chile. December 2008.

		Group 1	Group 2	Group 3
Gender	Masculine	38.0	9.3	29.0
P=0.000	Feminine	62.0	90.7	71.0
Age	< 35 years	19.7	11.2	13.7
P=0.019	35-49 years	35.0	39.0	37.2
	50-64 years	38.0	36.3	39.6
	55 years or older	7.3	13.4	9.5
Family size	1-2 members	35.0	16.1	37.1
P=0.000	3-4 members	50.4	56.8	39.9
	5 or more	14.5	27.1	23.0
Area of residence	Urban	88.9	89.0	83.8
P=0.033	Rural	11.1	11.0	16.2
Socioeconomic group	ABC1	35.9	19.5	29.9
P=0.000	C2	33.8	49.0	32.9
	C3	18.4	22.7	23.4
	D	10.3	7.6	10.4
	E	1.7	1.2	3.4
Ethnicity	Mapuche	9.4	6.1	16.7
P=0.000	Non-Mapuche	90.6	93.9	83.3