

RESEARCH PAPER

Consumer responses to agricultural produce advertising in the O'Higgins Region of Chile

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Abstract

C. Adasme-Berríos, R. Jara-Rojas, B. Ramos-Cabello, M. Rodríguez, and M. Mora. 2013. Consumer responses to agricultural produce advertising in the O'Higgins Region, Chile. Cien. Inv. Agr. 40(1):31-41. The main objective of this article was to analyze consumer responses to agricultural produce advertising. A survey was given to a non-probabilistic sample of 400 consumers in Rancagua, the capital city of the O'Higgins Region. A principal components analysis (PCA) was performed to identify the main factors influencing the consumption of agricultural produce and recognized four factors that influence the consumption of agricultural products: influence of advertising, impact of produce advertising, consumption of vegetables, and advertising preference. Additionally, the market segments that respond to agricultural produce advertising were identified using decision-tree methodology (CHAID). The results show that education is the most important segmenting factor and that consumers with lower levels of education are more influenced by advertising. In addition, television is the most important medium for encouraging fruit and vegetable consumption.

Key words: Agricultural produce, CHAID, consumer behavior, principal components analysis.

Introduction

The World Health Organization (WHO) (2003) recommends consuming at least 400 grams of fruits and vegetables per day. Despite the wide range of fruits and vegetables that are available in Chile, consumption is half the WHO-recommended level (Olivares *et al.*, 2008). The problem of low

consumption of fruits and vegetables is critical, with the largest deficiencies observed in infants, children and adolescents. This phenomenon occurs not only in Chile but also in many other countries around the world, such as New Zealand and the USA (Olivares *et al.*, 2008; Boyton-Jarret *et al.*, 2003; Hammond *et al.*, 1999).

One way to increase the consumption of fruit and vegetables is through advertising to persuade consumers of their health benefits. Advertising

was defined by Stanton *et al.* (2001) as “all the activities involved in presenting to a group a non-personal oral or visual openly sponsored message regarding a product, service or idea”.

There has been relatively little agricultural product advertising such as fruit, vegetables, meat and eggs in developing or developed countries (Hammond *et al.*, 1999; Chaux-Grajales, 2005; Mariné and Piqueras, 2006; González-Díaz, 2008). Conversely, television advertising of products with high sugar, salt and/or fat contents has increased (Hammond *et al.*, 1999; Boynton-Jarrett *et al.*, 2003; Olivares *et al.*, 2003; Marine and Piqueras, 2006). Moreover, approximately 50% of television food-related advertising is for high-fat content foods (Nerille *et al.*, 2005; Mariné and Piqueras, 2006). Exposing children to television advertising for high-fat foods increases the likelihood they will consume unhealthy products (Gonzalez-Diaz, 2008). Hence, television changes eating habits and results in substituting highly advertized unhealthy food products for fruit and vegetables (Boynton-Jarrett *et al.*, 2003).

Promotional and educational advertising campaigns are needed to improve consumer choices (Chaux-Grajales, 2005; Olivares and Bustos, 2006). There are only a few examples in Chile of mass media agricultural product advertising, such as eggs (radio), avocado (print media), and milk (television). Recently, two programs have been sponsored by the Chilean Government on television and radio, “5 al día” (which aims to prevent chronic diseases associated with poor eating habits and promotes eating 5 fruits and vegetables per day) and “Elige vivir sano” (which promotes eating healthy foods, increasing physical activity and the benefits of family activities, including contact with nature, respect for the environment and outdoor activities).

The main objective of this study was to analyze consumer responses to advertising for agricultural produce in Rancagua (the O’Higgins region, Chile). A second objective of this study was to

determine the market segments influenced by this advertising.

Materials and methods

Sample

This study was designed to be exploratory and descriptive and was conducted in Rancagua, Chile (the O’Higgins region, 33° to 35°01 S., 70°02’W.). A survey was prepared and administered to a sample of 400 consumers over 18 years old. The sample was obtained through a simple random sampling formula for a non-finite population ($N > 100,000$; Rancagua has 157,140 inhabitants, according to the 2002 Census), with a 95% confidence level and 5% standard error with p equal to 0.5 (Hernández *et al.*, 2006). The data were collected by interviews conducted at the main plaza of Rancagua close to banks, stores and supermarkets, following the mall intercept model. Interviews were conducted in September and October 2010. The questionnaire was previously validated through a preliminary test with 10% of the sample.

Information collection instrument and procedure

The questionnaire was structured with closed questions on fruit and vegetable consumption, knowledge of advertising for agricultural produce, self-declared influence of advertising related to agricultural produce, self-declared views on the need to increase agricultural produce advertising, and the influence of different forms of communication media. Classification questions were included to establish self-declared opinions about advertising, as well as general demographic information, including gender, age, marital status, family size, educational level, occupation, and family income (Table 1). An adaptation of attitude scales toward advertising (cognitive, usefulness, and informative) from the Marketing Scale Handbook (Bruner *et al.*, 2005) was used to

measure self-declared opinions about advertising agricultural produce. Consumer opinions were measured through 14 statements (Table 2), which the interviewees could use to indicate their level of agreement using a five-level Likert scale: (1) totally disagree, (2) disagree, (3) neutral, (4) agree and (5) totally agree.

Statistical analysis

The consumer response to agricultural produce advertising was determined by factor analysis through a principal components analysis (PCA). A varimax orthogonal rotation was used for the

PCA, and the adequacy of the PCA was determined with the Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity (Luque, 2000; Hair *et al.*, 1999). Cronbach's Alpha (Alpha) was included to measure the internal consistency of the analysis (Luque, 2000; Hair *et al.*, 1999).

After the main factors were obtained, decision-tree methodology through the CHAID program (Chi-squared Automatic Interaction Detection) was used to determine the population segments influenced by advertising (Luque, 2000, Diaz-Perez *et al.*, 2005; van Diepen and Franses, 2006; Kim *et al.*, 2011). SPSS version 18.0 was used to analyze the database (SPSS Inc., Chicago IL. USA).

Table 2. Demographic characterization of the sample (N = 400).

| Sample | Components | Percentage (%) | Mean (SD) |
|---|--------------------------|----------------|--------------|
| Gender | Male | 37.0 | |
| | Female | 63.0 | |
| Age (years) | 18 to 25 | 41.0 | |
| | 26 to 49 | 40.6 | |
| | 50 to 65 | 15.5 | |
| | > 65 | 3.0 | |
| Marital status | Single | 56.3 | |
| | Married | 34.3 | |
| | Widowed | 4.3 | |
| | Divorced | 5.3 | |
| Family size | | | 3.72 (1.131) |
| Education level | Primary | 14.0 | |
| | Secondary | 35.5 | |
| | Vocational school | 18.5 | |
| | University | 32 | |
| Family income per month | < US\$ 436 | 30.0 | |
| | US\$ 437 to US\$ 880 | 35.0 | |
| | US\$ 881 to US\$ 1,340 | 21.3 | |
| | US\$ 1,341 to US\$ 3,600 | 11.8 | |
| | > US\$ 3,600 | 2.0 | |
| Know or remember any type of agricultural produce advertising | Yes | 35.3 | |
| | No | 64.8 | |
| Agricultural produce needs to be advertised more | Yes | 93.8 | |
| | No | 6.3 | |
| Consider advertising when buying agricultural produce. | Yes | 31.5 | |
| | No | 68.5 | |
| Most reliable advertising medium for consumers | None | 11.3 | |
| | TV | 52.3 | |
| | Radio | 9.8 | |
| | Internet | 11.5 | |
| | Billboards | 1.3 | |
| | Newspapers or magazines | 14.5 | |
| | Direct mail | 0.5 | |

Results

The consumers interviewed were mainly women, and 81.6% of the sample was under 49 years of age, 56.3% were single and 34.6% married. The average family size was less than four members. Only 14% of the interviewees had only attended primary school, and 30% had family incomes of less than US\$ 436 (1 dollar = 518 Chilean pesos (January 2, 2012)) per month. More details are shown in Table 1. Approximately 35% of the interviewees take advertising into account when they purchase agricultural produce, although they did not remember any specific type of advertising for food. However, only 8% of those who stated

having observed food product advertising also noted agricultural produce advertising (data not shown). The rest of the interviewees referred mostly to processed products, such as canned and frozen juices. In addition, 93.8% of the interviewees thought it was necessary to increase agricultural produce advertising. Of the interviewees, 53.3% thought that television is currently the most reliable advertising media for making any type of purchase.

The PCA was carried out by the adaptation of cognitive, usefulness, informative and attitude toward advertising scales. The PCA found four significant factors and, as shown in Table 2, the econometrics results revealed a significant

Table 2. Rotated component matrix of the factors derived from a principal components analysis.

| Variables | Factors | | | |
|---|--------------------------|-------------------------------|--------------------------|------------------------|
| | Influence of advertising | Impact of produce advertising | Consumption of vegetable | Advertising preference |
| 1 I am influenced by advertising | 0.808 | 0.137 | 0.039 | 0.071 |
| 2 Advertising influences me to purchase innovative fresh agricultural produce | 0.708 | 0.166 | -0.073 | 0.183 |
| 3 Agricultural produce advertised on TV is better quality than other foods | 0.659 | 0.024 | -0.094 | -0.017 |
| 4 Family and friends influence me when I buy agricultural produce | 0.631 | 0.199 | 0.169 | 0.083 |
| 5 Agricultural produce advertising made me choose it | 0.209 | 0.71 | -0.03 | 0.086 |
| 6 Between advertised and unadvertised agricultural produce, I prefer to purchase advertised produce | 0.233 | 0.694 | 0.19 | -0.037 |
| 7 I consider it useful that merchants show their agricultural produce on websites | -0.095 | 0.628 | 0.052 | 0.216 |
| 8 Advertising of agricultural produce is essential for their consumption | 0.333 | 0.537 | 0.044 | 0.092 |
| 9 I cook with a wide variety of vegetables | -0.057 | 0.033 | 0.777 | 0.082 |
| 10 My friends often consume fruit and vegetables | 0.03 | 0.138 | 0.72 | -0.099 |
| 11 I often consume fruit and vegetables | 0.047 | 0.008 | 0.681 | 0.354 |
| 12 I would like more advertising about agricultural produce | 0.114 | 0.237 | 0.05 | 0.743 |
| 13 I would like higher quality agricultural produce advertising | -0.06 | 0.389 | 0.088 | 0.664 |
| 14 Advertising would give me more information about agricultural produce | 0.328 | -0.21 | 0.109 | 0.595 |
| Explained variance by factor (%) | 16.7 | 14.5 | 12.1 | 11.4 |
| Cumulative explained variance (%) | 16.7 | 31.2 | 43.3 | 54.7 |
| Alpha | 0.718 | 0.641 | 0.586 | 0.518 |
| KMO | | | | 0.776 |
| Bartlett test | | | sig. | 0.000 |

sig.: significance.

correlation among the variables (Bartlett's sphericity test).

The factors are described as follows:

Factor 1: *Influence of advertising*: This factor is composed of four items that represent a summary of the persuasive and informative elements of advertising that can influence consumer behavior. This factor explains 16.7% of the variance.

Factor 2: *Impact of produce advertising*: This factor explains 14.5% of the variance and is composed of four items that include the consumer concerns about the advertising and purchase of agricultural produce.

Factor 3: *Consumption of vegetables*: This factor explains 12.1% of the variance. It is composed of three items that characterize consumers that have positive behaviors toward fruit and vegetable consumption. This group is autonomous from advertising at the moment of purchasing agricultural produce purchase.

Factor 4: *Advertising preference*: This factor explains 11.4% of the variance and is composed of three items that indicate that the consumers prefer to be exposed to advertising of agricultural produce.

The reliability of the factors estimated through Alpha was 0.718 for Factor 1, 0.641 for Factor 2, 0.586 for Factor 3 and 0.518 for Factor 4.

The results of CHAID procedure are shown in Figure 1. "Consumers consider advertising when buying agricultural produce" was the dependent variable, and socio-demographic variables and factor analysis were the explanatory variables. The three descriptors for where the nodes split were education level, impact of produce advertising and influence of advertising. Of all the respondents (n = 400), 31.5% considered advertising when buying agricultural produce. The first splitting variable was *education level*. At Node 1, 40.4% of the

respondents with lower education levels considered advertising when purchasing agricultural produce. In contrast, 22.8% of the respondents with higher education levels took advertising into account.

The second division was based on the variable of the *impact of produce advertising*. Node 1 diverged into Nodes 3 and 4, while Node 2 diverged into Nodes 5 and 6. Approximately 31.1% of the interviewees with lower education levels who were less affected by advertising (Node 3) had a lower probability of considering advertising at the moment of purchasing agricultural produce. Conversely, 59.1% of the interviewees with lower education who were more affected by advertising (Node 4) reported considering advertising when purchasing agricultural produce. At Node 5 only 11.5% of the respondents with higher education who were less affected by advertising reported considering advertising when purchasing agricultural produce. Node 6 was composed of consumers with higher education who were more affected by advertising. The results reveal 31.3% likelihood of purchasing agricultural produce.

The last split was the influence of advertising and included two segments. The first group (Node 7) was comprised of consumers with higher education who were affected by advertising but were less affected than the other group (Node 8). The probability of purchasing advertised produce for this group was 16.7%. The second group (Node 8) was composed of consumers with higher education levels that were affected and influenced by advertising. The likelihood of these members of this group purchasing advertised agricultural produce was 41.8%.

Discussion

Based on these results, advertising could play a crucial role in increasing vegetable consumption. Most consumers stated that if television advertising for fruit and vegetables increased, they would increase their consumption. According to our

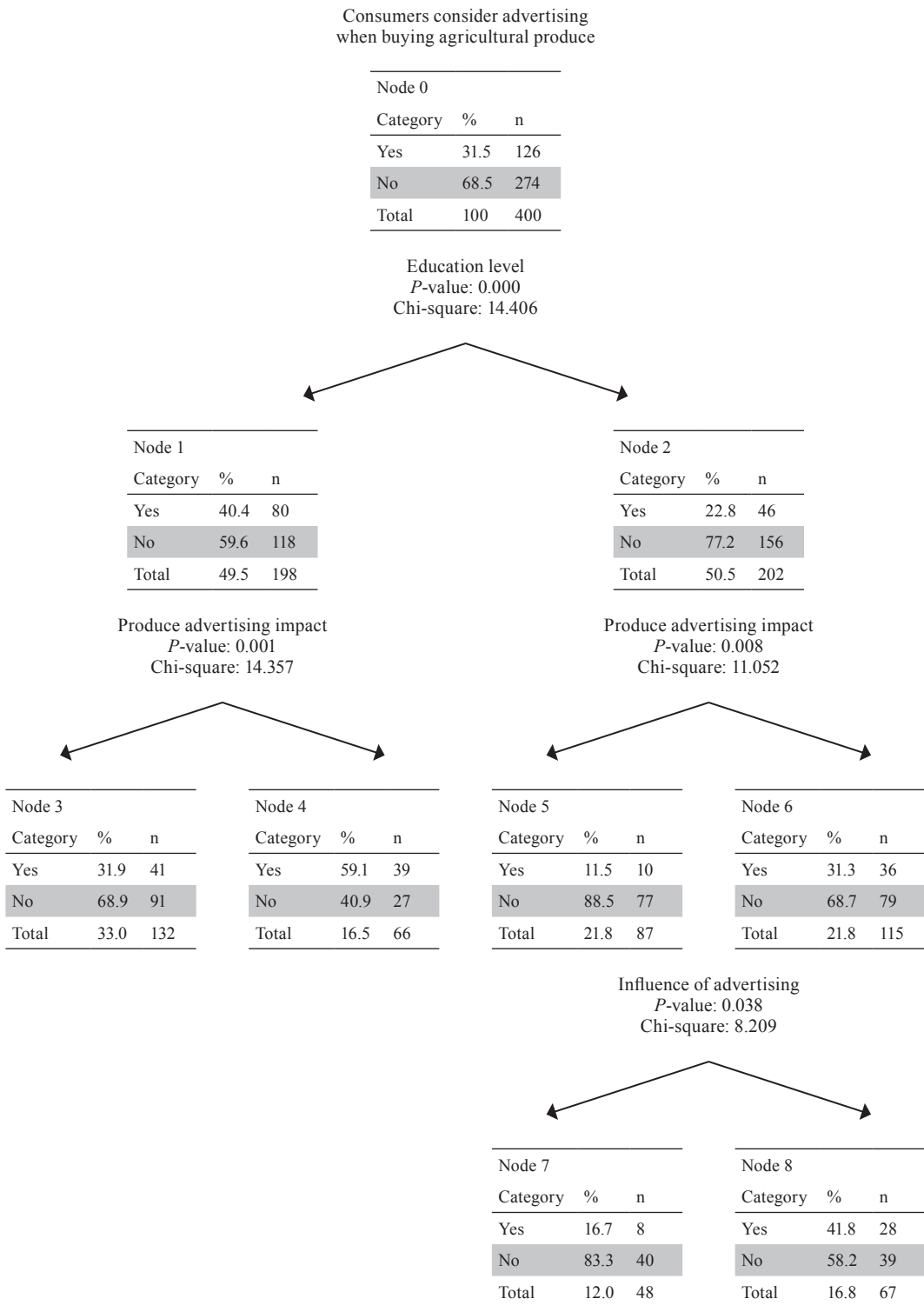


Figure 1. Consumer segmentation with the CHAID decision tree.

findings, television is the most reliable advertising medium, which is consistent with Moisa *et al.* (2011).

Nicklas *et al.* (2011) and Ip *et al.* (2007) show that parents prefer television advertising for choosing their children's food because it is a powerful source of information. However, they also believe that advertising should be regulated to increase the promotion of healthy food over junk food. Conversely, Boyton-Jarrett *et al.* (2003) state that television advertising is inversely associated with the intake of fruits and vegetables among adolescents.

The KMO test from the factor analysis has a value of 0.776, indicating a good fit of the data to a factorial model (Hair *et al.*, 1999). The four factors used here explain 54.7% of the total variance, which is sufficient to describe overall consumer response to advertising (Henson and Kyle, 2006).

Factor 1 obtained by the PCA is defined as the *influence of advertising* because it explains the capacity of advertising to inform and change future consumer decisions (Suzuki and Kaiser, 1997; Paz *et al.*, 2000; Orth *et al.*, 2010; Moisa *et al.*, 2011). This finding is in line with von der Fehr and Stevik (1998) who argue that informative advertising is more effective with differentiated products. However, certain forms of persuasive advertising are particularly effective when products are slightly differentiated. Mehta (2000) states that consumers who enjoy looking at ads are more likely to be persuaded by advertising.

Factor 2 obtained by the PCA is defined as the *impact of produce advertising* because it demonstrates the importance given to advertising by consumers at the moment of purchasing agricultural produce. This finding is consistent with results reported by Richards (2000), Carman and Rodríguez (2004), Pollard *et al.* (2008) and Liaukonyte *et al.* (2010) who found that advertising fruits and vegetables has significant and positive effects on consumption. According to Pollard *et al.* (2008), advertising increased the consumption

of vegetables in Australia by 20%. Liaukonyte *et al.* (2010) affirm that advertising has positive effects on purchasing but does not increase the willingness to pay for agricultural produce. Furthermore, if consumers have doubts or are skeptical about advertising, the effect on purchasing choices will be negative (Chen and Leu, 2011).

Factor 3 obtained by the PCA is defined as the *consumption of vegetables* and it demonstrates those consumers who are impervious to advertising. These results are consistent with Rickertsen (1998) and Rickertsen *et al.* (1995) and indicate that advertising does not affect the demand for vegetables. Nicklas *et al.* (2011) found that advertising is most likely an effective strategy to influence children's preferences for vegetables, but not for fruit.

Regarding the reliability analysis of the four factors discussed here, the Alpha values should be higher than 0.7; however, our values are statistically valid for an exploratory study and show the degree of reliability of this survey (Nunnally, 1967; Hair *et al.*, 1999; Sulé *et al.*, 2002; Chen and Li, 2007; Mora *et al.*, 2011).

Nevertheless, it is possible to find consumers with clear advertising preferences (Factor 4). This finding agrees with the results of Paz *et al.* (2000) who found that young people believe that advertising provides information to consumers but that the information might not be true. Crespi and Marette (2002) state that generic advertising has a small effect on the perceived qualities of different brands. In addition, if the consumers are in the right mood when they observe advertising, they are more likely to consume the product (Dominguez, 2001).

Education level clearly affects the consumer response to advertising. Consumers with lower levels of education are more sensitive to advertising and can be affected by advertising more easily than people with higher levels of education. A significant segment of the population, especially those with lower levels of education, use television as their

main source of information (Table 2). Similar results have been reported by Moretti *et al.* (2011) about education levels and the role of advertising.

The research of Vera (1998) showed the impact of advertising on education of the society stating that it is necessary to educate people to live in a persuasive environment and educate them about consumption. Along similar lines, Richards and Petterson (1999) found that advertising increased the likelihood that consumers would buy apples. However, these results do not agree with those of Rickertsen (1998) that show no significant effects of advertising on the demand for vegetables.

Conversely, people with higher levels of education who are sensitive to the impacts of advertising are more influenced by advertising because of its ability to inform and to persuade (Suzuki and Kaiser, 1997; Paz *et al.*, 2000; Orth *et al.*, 2010; Moisa *et al.*, 2011). However, these results do not agree with Chaux-Grajales (2005) which states that people with higher incomes are less influenced by advertising than people with lower incomes.

In general, consumers with higher levels of education have better incomes and are likely to have more exposure to information. Therefore, they tend not to believe everything they see in television advertisements and consider some commercials to be offensive, in poor taste, or not relevant to their needs or self-image (Alwitt and Prabhaker, 1992).

Three aspects of this study should be highlighted for future consideration in studies in this region and the rest of Chile. When considering the effectiveness of advertising in the short-term, the decision-makers efforts should be aimed at supporting agricultural produce advertising. Promotional television campaigns should be developed to persuade different types of consumers, such as youth and parents, to increase fruit and vegetable consumption. Children exposed to television advertising remember the content and are influenced by it, changing unhealthy eating habits (Boyton *et al.*, 2003; González-Díaz,

2008). In addition, this type of campaign should be focused on children's television programs.

Currently, there are existing educational campaigns, aimed at school-aged children, supported by the government of Chile. However, the results of these campaigns will not be observed for several years. Hence, in the long-term, policy makers should consider the role of education and continue the effort of offering healthy food in schools instead of junk food.

Adults should not be overlooked. The government should establish promotional and educational campaigns through different media, especially television, with the participation of companies that support the consumption of fruit and vegetables. Simple efforts to avoid obesity could save significant amounts of money that is spent annually on health care for preventable diseases.

The study of consumer responses to agricultural produce advertising establishes the clear need for consumers to be exposed to advertising to increase the consumption of vegetables. In addition, the main market segments are determined by the education level of the consumer, with people with lower levels of education being more influenced and affected by advertising. Hence, campaigns aimed at lower-income populations with lower education who are accustomed to getting information mainly through television could contribute to reducing obesity by promoting fruit and vegetable consumption. Therefore, regional efforts could establish targets based on the results of this study.

Finally, the results cannot be generalized to the whole population of Chile because results from other regions are needed to generate a broader understanding of consumer responses to agricultural produce advertising.

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Resumen

C. Adasme-Berrios, R. Jara-Rojas, B. Ramos-Cabello, M. Rodríguez y M. Mora. 2013. Respuesta del consumidor a la publicidad de productos agrícolas en la Región de O'Higgins, Chile. Cien. Inv. Agr. 40(1):31-41. El objetivo general de la investigación fue analizar la respuesta del consumidor hacia la publicidad en productos agrícolas. Para este propósito una encuesta fue aplicada a una muestra no probabilística de 400 consumidores en la ciudad de Rancagua, capital de la Región de O'Higgins. Un análisis factorial de componentes principales (PCA) fue desarrollado para identificar los principales factores que influyen en el consumo de productos agrícolas. El análisis de PCA reveló la existencia de cuatro factores: influencia de la publicidad, impacto de la publicidad en productos agrícolas, consumo de vegetales, preferencia a la publicidad. Adicionalmente, los segmentos de mercado que responden a la publicidad en productos agrícolas, fueron identificados usando la metodología de árbol de clasificación (CHAID). Los resultados muestran que la educación es el factor de segmentación de mayor importancia, donde las personas con el menor nivel de educación son más influenciadas por la publicidad. Además, la televisión es el medio comunicacional más influyente para mejorar el consumo de frutas y hortalizas.

Palabras clave: Análisis de componentes principales, CHAID, comportamiento del consumidor, productos agrícolas.

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