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Consumer choices of pork chops: Results from two Canadian sites

T.M. Ngapo [a,*], J. Fortin [a], J.L. Aalhus [b], J.-F. Martin [c]

[a] Agriculture and Agri-Food Canada, Food Research and Development Centre, 3600 Bd Casavant Ouest, Saint-Hyacinthe, Québec, Canada J2S 8E3
[b] Agriculture and Agri-Food Canada, 6000 C & E Trail Lacombe, Alberta, Canada T4L 1W1
[c] Unité de Maladies Métaboliques et Micronutriments, INRA, Theix, 63122 St-Genès-Champanelle, France

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ABSTRACT

Digital photographs of 16 pork chops were each modified to give 16 treatments: two levels each of fat cover, colour, marbling and drip (256 images in total). Consumers from two Canadian provinces, Québec (248) and Alberta (805), selected their preferred chop from 16 treatments in different chops and repeated this selection process eight times from different groups of chops. Representative sub-panels of 200 consumers from each province were selected to facilitate comparison. Colour and fat cover were the most frequently chosen characteristics. The three preference-based clusters of consumers showed no correlation with the socio-demographic-based clusters, but did show a significant influence of survey location; the cluster preferring dark red, lean pork had a higher proportion (61%) of consumers from Alberta than Québec, whereas the two clusters preferring light red pork had higher proportions of Québec consumers (about 56% each). These preferences suggest that a more extensive Canadian study is warranted.

1. Introduction

Consumer preference and choice is believed to depend on the interaction of the objective qualities of the product with the attitudes and expectations of the consumers. These attitudes and expectations are thought to vary according to culture. Evidence of these differences has been provided by investigations of cross-cultural differences in food preferences among consumers in different countries, including the study of British and Danish consumer preferences for different levels of apple mealiness (Jaeger, Andani, Wakeling, & MacFie, 1998), preferences for plain chocolate amongst Polish and Belgian consumers (Januszewska & Viaene, 2001) and American and Spanish consumer preferences for sweets and beverages (Zellner, Garriga-Trillo, Rohm, Centeno, & Parker, 1999). Cultural differences within a country have also been reported, such as snack texture preferences amongst Australian consumers of Chinese- and European-origin (Murray, Easton, & Best, 2001) or apple labelling preferences of New Zealand and Samoan consumers resident in New Zealand (Jaeger, 2000).

A study of consumer preferences for pork demonstrated differences across 23 countries (Ngapo, Martin, & Dransfield, 2007a, 2007b) using photographic images of raw pork chops that varied systematically in appearance. Within some of these countries, differences in the preferences of consumers from different regions have also been found. Consumer preferences differed between Taiwan and mainland China (Ngapo et al., 2007a, 2007b) which although cited as two countries in the publications are in fact officially one. In France (Ngapo, Martin, & Dransfield, 2004), consumers from three sites with less than 1000 km separating the two furthest sites, showed differing preferences. And trends differing according to survey site were also observed among six cities in South Korea (Cho et al., 2007), a country of about 500 km distance between furthest points.

Canada was one of the participating countries in this international consumer preference study, being undertaken in two provinces, Alberta and Québec. With almost 4000 km separating these two provinces, Canada's large geographical distances make for an interesting study. But perhaps of even more interest than the physical distances are the cultural divisions found in Canada that provide a unique environment to undertake cross-cultural studies.

This study aims to both identify the most important characteristics of fresh pork which determine consumer choice in two Canadian sites (Alberta, an Anglophone province, and Québec, a Francophone province) and to show how consumer segmentation in choice relates to socio-demographic and cultural differences.

* Corresponding author. Fax: +1 450 773 8461.
E-mail address: tania.ngapo@agr.cgc.ca (T.M. Ngapo).

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2. Materials and methods

2.1. Pork chops

The method and chop characteristics are described in detail by Ngapo et al. (2004). Briefly, photographs of 16 commercial pork chops were computer-modified to give two levels of each of the characteristics: fat cover (averages of 8% or 17% chop surface area for lean or fat chops, respectively), colour (average CIELAB L^* of 64 or 56, and a^* of 18 or 24 for light and dark red chops, respectively), marbling (absent or about 1.5% of the muscle area) and drip (absent or 5.5% of the chop area). The resulting 256 ($2 \times 2 \times 2 \times 2 \times 16$) images have been published as a book (Dransfield, Martin, Miramont, & Ngapo, 2001) comprised of six series of which series 1 + 2, 3 + 4, and 5 + 6 each contain all 256 images. A series constitutes 16 (A4) pages or eight double-pages. Every double-page contains the 16 different chop shapes and each chop represents one of the combinations of the four characteristics studied. Therefore, every double-page contains a complete set of all 16 combinations of the two levels of each of the four characteristics. Both the order of representation of the characteristics with respect to the chop shape and the position of the chops in a double-page are randomised. It is important to note that the chop shape was not a factor studied, but can be considered a distraction and a means to realistically present a range of characteristics to the consumer.

2.2. Consumers

Consumers were pork eaters older than 15 years of age and chosen at random. Consumers were surveyed in March 2002 in Alberta and in July and August 2002 in Québec at a range of sites, including agricultural shows, supermarkets and at their workplaces. A total of 1053 consumers completed the survey, comprised of 805 Albertans and 248 Québécois.

2.3. The selection process and questionnaire

Each consumer selected their preferred chop from each double-page showing the 16 combinations of two options of each of the characteristics of colour, fat cover, marbling and drip. The selection was repeated from eight different double-pages which showed the same 16 appearance characteristics and chops, but in different combinations as previously described (Ngapo et al., 2004). The consumers also completed a short questionnaire asking basic socio-demographic and purchase- and eating-behaviour information (Table 1). The questionnaire was of an exploratory nature since it was neither embedded in a theoretical economic or attitudinal framework, nor based on hypotheses. Each new consumer was given a series in the order 1–6 so that all series were used approximately equally throughout a survey period.

2.4. Data analyses and statistical methods

2.4.1. Sub-panel selection

To facilitate comparison of results from the two provinces, two socio-demographic factors, age and gender, were selected to define a common base for all panels as was previously done in the study across 23 countries (Ngapo et al., 2007a, 2007b). For each of the two provinces, sub-panels of 200 consumers were randomly selected comprising 100 each of men and women, and each divided into two groups of 50 consumers of <35 and $\geqslant$35 years of age. The chop preferences were calculated for each gender $\times$ age group of the sub-panel and for the corresponding group of the entire panel. When significant differences (χ^2 test, $P < 0.05$) were observed between the choices of the sub-panel and the entire panel, a new group was randomly selected. The process was repeated until there were no significant differences between choices of each of the four groups (gender $\times$ age) and the corresponding groups in the entire panel. The final four groups, of 50 consumers each, were combined giving sub-panels of 200 consumers, representative of the entire panel for a given province.

2.4.2. Analysis of choices

The choices consumers made were divided into three categories for each characteristic; in the first two categories the consumer actually chose one of the two levels of the given characteristic, this contrasts with the third category where the given characteristic was not consistently selected. The results were quantified by the definition that if $\geqslant$6 of eight choices for one consumer are the same for a given characteristic, the choice is a 'real' choice ($P < 0.14$). If <6 choices are the same, selection for the given characteristic is considered to be 'inconsistent'. This test assumes a binomial distribution of the results ($P = 0.5$). Significant differences in the number of choices were observed using the χ^2 test ($P < 0.05$).

The number of characteristics used to form consistent choices was then obtained by calculating the percentage of consumers using 0, 1, 2, 3 or all 4 characteristics. For each consumer in a sub-panel and using all choices, the sum of the number of times each combination of characteristics was selected is calculated. Using the sums for each combination, a contingency table is constructed comprising the consumers in the sub-panel and their choices. Using this contingency table, a correspondence analysis using all 15 dimensions was undertaken accounting for 100% of the variability. The coordinates of each consumer obtained in the 15 dimensions of the correspondence analysis were used as the basis for cluster analyses. Firstly, a hierarchical cluster analysis using Ward distance was undertaken using the SAS CLUSTER procedure (SAS., 1999). The number of clusters to be retained was selected by considering the 'distance' between clusters and the profile of the resulting graph. A disjoint cluster analysis was then carried out using the SAS FASTCLUS procedure (SAS, 1999) forcing the consumers into the different clusters. Links between the consumer choice-based clusters and questionnaire items were determined using χ^2 test. Similarly to the choice data, correspondence and cluster analyses were undertaken to define clusters based on the questionnaire items.

3. Results

3.1. Consumer panels

The socio-economic questionnaire composition and responses are given in Table 1. About a third of consumers from both sites were single and two thirds married. A greater proportion of the Québec consumers (45%) lived in two person households than the proportion of Alberta consumers (31%), which in turn were in greater proportion in the households of three or more people (57% in Alberta compared to 43% in Québec). These results were also reflected in the proportions of consumers living with children, being greater in Alberta than in Québec. More consumers lived in the city or a town than in the country or a village, the ratio of Québec consumers living in the city or town to those in the country (2.8) being greater than that of the Alberta consumers (1.4). A greater proportion of Alberta consumers had also lived for at least a year in the country than the Québec consumers.

The distribution of age at which the consumer finished studying is similar for the two sites and relatively evenly distributed across all categories. Note that, as for a number of other questions, there were fewer consumers from Québec who responded to this