Meat Science 129 (2017) 102–110

Contents lists available at ScienceDirect

Meat Science

journal homepage: www.elsevier.com/locate/meatsci

Consumer preferences for pork chops in five Canadian provinces

T.M. Ngapo

Saint Hyacinthe Research and Development Centre, Agriculture and Agri-Food Canada, 3600 boul. Casavant Ouest, St-Hyacinthe, Québec J2S 8E3, Canada

ARTICLE INFO

Article history:
Received 20 December 2016
Received in revised form 21 February 2017
Accepted 24 February 2017
Available online 27 February 2017

Keywords:
Preferences
Consumers
Choice
Pork

ABSTRACT

The aim of this study is to identify the most important characteristics of fresh pork that determine consumer choice in five Canadian provinces. Within-consumer preference replication and systematic image manipulation in surveying showed differences in strategies for pork choice in lean colour ($P < 0.001$) and marbling ($P = 0.006$). High proportions of Nova Scotians (29%) chose light red pork, Albertans (42%) dark red and Quebecers (29%) non-marbled pork. Overall, the most important choice criteria were fat cover (57% preferred lean, 8% fatty) and lean colour (35% dark red, 18% light red). Marbling and drip were less used, but are important noting that 26% of consumers used three or four characteristics to make their choice. The preferences are readily met by the industry, but unfortunately, preferences for minimal or no marbling and fat cover likely result in a compromised gustative experience for many Canadian consumers.

1. Introduction

Canada was the third largest exporter of pork in the world in 2015, second only to the USA and the EU and exporting more than one million tonnes of pork to over 100 countries (Canada Pork International, 2016). Canadian pork exports have grown significantly in the past 15 years increasing from about 200,000 t in 1990 and currently equate to about two thirds of Canadian production (Canadian Meat Council, 2016). These impressive figures often overshadow the remaining third of Canadian produced pork that is consumed on the domestic market. Canada has a population of >36 million consumers and an annual per capita pork consumption of 25 kg (National Pork Board, 2016). Canadian production for the domestic market does not meet demands and is supplemented with imported pork which in 2014 tallied almost 200,000 t. Therefore, although only a third of domestic production remains in Canada, when combined with imports domestic Canadian pork sales represent a significant market.

Canada's population is the 39th largest in the world (CIA, 2016) and per capita pork consumption is 11th (National Pork Board, 2016). Second only to Russia in land mass and of extremely varied topography, Canada is made up of indigenous, anglophone and francophone provinces and territories and has a population that is about 20% foreign-born (Statistics Canada, 2016). This cultural and geographic diversity make for an unique environment which potentially impacts consumer preferences and behaviour and which was the basis for comparison of consumer preferences for pork from two Canadian provinces in 2002 (Ngapo, Fortin, Aalhus, & Martin, 2010). In this study, consumers from Alberta and Quebec, almost 4000 km apart and, respectively, anglophone and francophone provinces were surveyed to identify the most important characteristics of fresh pork which determine consumer choice and to show how consumer segmentation in choice relates to socio-demographic and cultural differences. Significant differences in pork preferences were observed with survey site, such as the observation that more Albertans preferred the dark red pork and more Quebecers preferred the light red.

This Canadian study was a part of a much larger study undertaken in 23 countries (Ngapo, Martin, & Dransfield, 2007a, 2007b). The survey method was based on the use of digital photographs allowing the systematic assessment of the impact of varying appearance characteristics on consumer choice. Not only were significant differences observed in the choice strategies among countries (Ngapo et al., 2007a, 2007b), but regional differences were also observed in South Korea (Cho et al., 2007) and France (Ngapo, Martin, & Dransfield, 2004) and hence the study of the Canadian data (Ngapo et al., 2010). However, more than three times the consumers of the Canadian panel were from Alberta and a subpanel of 200 consumers standardised for age and gender was taken for comparison to the Quebec panel. While the 3:1 ratio corresponded to the anglophone:francophone ratio, it was acknowledged that Albertans are not necessarily representative of the entire anglophone Canadian population. Indeed, the geographical distances and cultural differences across Canada combined with the differences in preferences between the Quebec and Alberta consumers demonstrated that a more extensive study of Canadian consumer preference was warranted.

E-mail address: tania.ngapo@agr.gc.ca.

http://dx.doi.org/10.1016/j.meatsci.2017.02.022

The current study therefore aims to identify the most important characteristics of fresh pork that determine consumer choice in five Canadian provinces and to show how consumer choice relates to cultural and socio-demographic differences.

2. Materials and methods

2.1. Pork chop images

The chop characteristics and methodology are detailed in the study by Ngapo et al. (2004). Briefly, photographs of 16 store bought pork chops were modified to give two levels of fat cover, colour, marbling and drip. A book of the resulting 256 images was published (Dransfield, Martin, Miramont, & Ngapo, 2001). In this book, every double page contains the 16 chop shapes and each shape represents one of the combinations of the four characteristics studied. The position of the chops and the order of representation of the characteristics with respect to the chop shape in a double-page were randomised.

2.2. Consumers

Consumers were randomly intercepted at agricultural shows with large general public admission and invited to participate in the survey. Those who accepted the invitation were asked to select their preferred chop from each of 8 double-pages in the pork choice albums (Ngapo et al., 2004). The consumers were then asked to complete a short questionnaire asking basic socio-demographic and purchase- and eating-behaviour information (Table 1). The questionnaire was exploratory in nature since it was neither based on hypotheses nor embedded in a theoretical economic or attitudinal framework. A total of 1508 responses was obtained.

The shows and dates at which the consumers were intercepted were the Calgary Stampede, Calgary, Alberta (July 5–7, 2008), the Maritime Fall Fair, Halifax, Nova Scotia (October 10–13, 2008), The Royal Agricultural Winter Fair, Toronto, Ontario (November 13–16, 2008), the Salon d'Agriculture, Saint Hyacinthe, Quebec (January 13–14, 2009) and the Pacific Agricultural Show, Abbotsford, British Columbia (February 19–21, 2009).

2.3. Analyses and statistical methods

2.3.1. Simulation

For each consumer, the greatest repeatability within the 8 choices of the book of images was designated as the "main choice". For example, a main choice of 2 means that the most repeated combination of all four characteristics for that consumer was chosen 2 times out of 8. The probability of achieving the main choice at random was determined by simulation whereby 8 numbers between 1 and 16 were randomly and independently selected 1000 times and the main choices determined.

2.3.2. Analysis of choices

The choices were divided into three categories for each characteristic; in the first two categories one of the two levels of the given characteristic is actually chosen by the consumer, whereas the characteristic is not consistently selected in the third category. The results can be quantified by the definition that if 6 of 8 choices for one consumer are the same for a given characteristic, the choice is a 'real' choice ($P < 0.14$) and not random. If <6 choices are the same for a given characteristic, the selection is considered to be 'inconsistent' or, in other words, randomly selected. This test assumes a binomial distribution of the results ($P = 0.5$). For each characteristic, significant differences in the number of choices were observed using the χ^2 test.

A hierarchical cluster analysis of consumer choice was undertaken using the SAS CLUSTER procedure (SAS, 2007). Four clusters were retained by considering the 'distance' between clusters and the profile of the resulting graph. A disjoint cluster analysis was then carried out using the SAS TREE procedure (SAS, 2007) forcing the consumers into the four different clusters.

2.3.3. Analysis of the questionnaire

Relationships between the consumer choice-based clusters and questionnaire items were determined using χ^2 test. Note that the χ^2 test requires a minimum of 5 responses and therefore where a strong bias existed for a given response the χ^2 test was not valid. All the results are shown, and where significant, the validity was checked; when not valid, the relationship between clusters and the criterion was not further investigated.

3. Results

3.1. Consumer panels

The socio-economic questionnaire composition and responses are given in Table 1. Note that some consumers did not respond to all questions in the survey and the hence the sum of the total responses for each questionnaire item may not equal 100%. However, no individual consumer omitted more than three responses. Generally, relatively consistent distributions were observed across the five provinces with a few notable differences, particularly in the self-reported characteristics of the Quebec consumers. The following is a summary of some of the differences in distributions.

A low proportion of consumers in the highest income bracket was observed in the Quebec sample (31% compared to 42% overall). Quebec (17%) and Nova Scotia (15%) had more consumers with dental prostheses that the other provinces (6–11%) which is interesting noting that these two provinces also had the lowest proportions of consumers in the >64-year-old age category (2 and 7%, respectively, compared to 9–10% in the other provinces). About a quarter of Quebecers and British Columbians claim to purchase meat from farms compared to 6–15% of consumers in the other provinces. In addition, 39% of Quebecers purchase meat at a butcher shop compared to 22% overall. More of the Quebecers (52%) cook meals everyday than consumers in the other provinces (30–43%) and high proportions of the Quebecers fry (66% vs 41% overall) and stew meat (37% vs 20% overall), while more Ontarians (61%) and Albertans (65%) grill/barbeque compared to consumers in the other provinces (45–55%). In Ontario, a low proportion (23% vs 41% overall) of consumers also reported frying meat. Fewer Quebecers eat alone (57% never eat alone vs 44% overall). A high proportion of Quebecers (75%) and low proportion of British Columbians (36%) eat pork more than once a week (53% overall). While about a third of consumers claimed to have changed their pork consumption, a high proportion of Quebecers in this category reported increasing pork consumption (75% compared to 42–55% for the other provinces). In terms of reasons for liking pork, compared to the overall proportions of consumer, price was selected by more Albertans (43% vs 36%) while versatility was selected by more Quebecers (55% vs 36%). However, taste was by far the most important reason for all provinces with 87% consumers overall selecting this characteristic of pork compared to 26–36% for the other four characteristics.

3.2. Range of characteristics

Table 2 compares the probability of randomly achieving the main choice versus the respondents' main choices. Fewer single or double choices were made, and more choices were made 3, 4, 5 and 6 times than would be expected randomly. This evidence of deliberate choice corroborates the findings of other studies using the same albums of images the French (Ngapo et al., 2004), Belgian (Verbeke et al., 2005), Greek and Cypriot (Fortomaris et al., 2006) and Taiwanese (Chen et al., 2010) surveys. The distribution of the repeatability illustrates that the levels of the characteristics used were sufficiently different to allow the consumers to make a positive (and not random) choice, but