agricultural

Consumer Perceptions
of Bison

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EXECUTIVE SUMMARY

The Canadian bison industry has grown rapidly in recent years as producers diversify their farm operations in response to poor returns from traditional commodities. The breeding stock market has dominated the bison industry, however, exclusive reliance on breeding stock to support growth in the industry is not viable in the long-run, as evidenced by the recent sharp decline in breeding stock prices. The identification and development of markets for bison products is essential to the long-term sustainability of the industry.

To date little is known about current or potential bison consumers and the characteristics or attributes those consumers look for in bison meat products. This information is key to identifying and developing markets for bison. The purpose of this study was to gather information about consumer preferences for bison. By identifying the bison meat attributes that are important to consumers it is possible to begin profiling the potential consumer of bison meat products and estimating the expected demand and price sensitivity in target markets. For the emerging bison meat industry little retail sales data is available, therefore a 'stated preference' methodology, (conjoint analysis) was used to evaluate consumer preferences for specific bison meat attributes.

The design of two empirical studies, a pilot and principal survey, is discussed. The surveys were conducted in Alberta, Canada in December 2000 and April 2001 respectively. The pilot study revealed that three categories of attributes - palatability, health and economic attributes – are important to the consumer red meat purchase and consumption decision. Palatability attributes included taste/flavour, tenderness and juiciness. Health attributes included fat, cholesterol and protein content. Price is a key economic attribute. A fourth category of attributes - image attributes - included whether the meat was a delicacy/special occasion meat, whether the product was uniquely North American, and whether it was locally produced. Compared to the other groups of attributes, the image attributes appeared to be of limited importance to consumers.

For the principal survey, 154 consumers were asked to evaluate hypothetical bison striploin steaks described in terms of price, fat content, tenderness, and convenience to prepare and cook. Price emerged as the most important attribute, followed by tenderness, fat content and convenience to prepare and cook. However, the results reveal a willingness-to-pay for improved tenderness, lower preparation time and reduced fat content, depending on the level of the attribute offered and the corresponding price increase.

Groups of respondents with similar preferences were identified, indicating that distinct market segments exist. Four groups had noticeably stronger preferences for one or more attributes. One of the groups, characterized as "Convenience First", placed a great deal of weight on convenience to prepare and cook the product. A second group "Palatability Rules" would be strongly influenced by tenderness in a bison purchase decision. A distinct group of consumers, "Low Fat Rules", was identified, for whom (low) fat content would be a major selling point. The "Price Conscious" market segment would be looking primarily for competitively priced bison products. The bison industry

has the opportunity to target product differentiation and product development strategies at these market segments.

Consumer attitudes towards a range of bison product and industry images were assessed. The results revealed that consumers have a variety of perceptions about bison, some of which are not accurate, for example, as many as 40 percent of respondents did not disagree with the (false) statement that bison are an endangered species. The bison industry has the opportunity to build on positive images and correct misperceptions about bison through future communication, public relations and promotional strategies. The analysis presented in this report provides a basis for further market research in the bison industry.

CONSUMER PERCEPTIONS OF BISON

1. INTRODUCTION

The bison industry presents diversification opportunities for farmers in western Canada. Bison herds have expanded rapidly in recent years and the industry, long driven by the breeding stock market, is slowly becoming more end-product focused. Product development and promotional activities aimed at raising the profile of bison meat have been initiated both by processors and industry associations. To date, however, little market research has been undertaken to assess consumer preferences for bison and to identify potential consumer market segments. Fundamentally, the industry does not really know who its consumers are, what types of products these consumers would be interested in, and what types of messages the bison industry should be communicating to consumers. This report presents the results of preliminary research that begins to help answer these questions.

The report is organized as follows: section 2 presents background information on the bison industry and the marketing challenges with which it is faced. Section 3 explains the research methodology used in this study. Section 4 describes the pilot study, insights from which were used to design the principal study. Section 5 presents the principal study and a detailed discussion of the research results. Section 6 concludes with a discussion of implications for industry development activities and some pointers for future marketing research in the bison industry.

2. INDUSTRY BACKGROUND

The marketing challenges facing the bison industry are perhaps typical of a dynamic emerging industry that undergoes rapid expansion in supply potential, with only gradual development of end markets and consumer demand. The breeding stock market has been the primary driver for investment in the Canadian bison industry, with lucrative prices for breeding animals leading to entry by new producers and expansion by existing producers. The Canadian bison population has grown quickly, from an estimated 9,100 head in 1991 to 99,022 head in 1999 (Nixdorf, 2001). Rapid expansion has yielded predictions that the number of bison available for the meat industry will increase from 8,000 in 1999 to 33,000 in 2004 (Conacher, 2000). This represents over a 300% increase in the number of carcasses available for the bison meat market in a short 5-year period.

Average bison stock prices from Alberta and Saskatchewan auction sales are charted in Figure 1[1]. The 1990s were characterized by escalating prices, ending in 1999 with a sharp price drop and a further decline in 2000. Average prices of two-year-old heifers and bulls from the 1998 industry peak to 2000 represents a 70 percent and 55 percent decline in prices respectively. This downward trend may be an indication that the industry has entered a new phase of development where commercial stock sales will begin to dominate over breeding stock. Market development for bison products is key to the continued buoyancy of the breeding stock market.

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[1] These prices have been converted to 1992 constant prices to enable a comparison of prices over time.

Figure 1. Weighted Average Bison Prices from Alberta and Saskatchewan Auction Sales 1975-2000
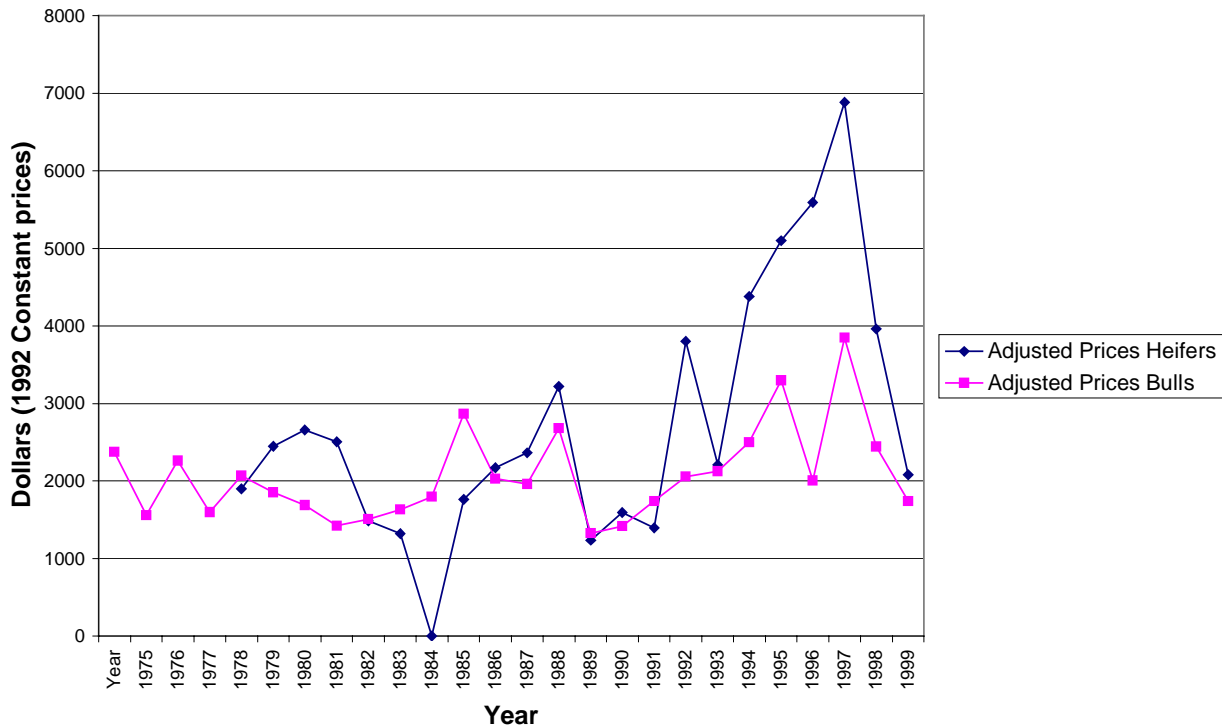
Source: Nixdorf (2001)

The dominance of the breeding stock market led to an emphasis on increasing herd size, with animals purchased primarily for their reproductive abilities (Hobbs et al., 2000). Limited meat sales have occurred, mostly through speciality meat stores, farm-gate sales and through the HRI (hotel, restaurant, institutional) trade. Finding markets for lower-value meat cuts has been a particular challenge. Combined with the lack of economies of scale in processing, this has meant that bison meat has not been price competitive with beef at the retail level. Given the supply of bison meat projected to be available in the near future, it is important to determine whether bison has sufficient consumer appeal to sustain price premiums, and therefore the extent to which bison products can be offered at a price premium relative to competitor meats.

2.1 Marketing Challenges

There are a number of challenges facing the Canadian bison industry, including identification and development of consumer markets, product consistency and quality and limited supply chain infrastructure for slaughter, processing and distribution (Hobbs and Sanderson, 2001). Little is know about potential bison consumers, what types of products they would purchase and their price sensitivity. Understanding how consumers perceive bison meat relative to other meat products will assist in determining the expected prices and potential market share for the bison meat industry.

Supply chain infrastructure is relatively limited. There are five federally inspected bison slaughter plants in western Canada, one in Manitoba, one in British Columbia and

three in Alberta. The Federal inspection status is necessary for shipments out of province to the rest of Canada and the US. Only two facilities in Canada are approved for export to the European Union. For a relatively new industry with a supply chain infrastructure that is not well established, information about what the consumer is looking for also provides guidance for supply chain development as processing, distribution and marketing strategy decisions are made for the emerging bison meat market. It also provides supply chain infrastructure investors with a clearer picture of the long-run viability of that investment.

Quality has become extremely important for the entire food industry, in response to increasing consumer incomes and the demand for a diverse range of value-added, convenient food products. "One product for all" is no longer a realistic approach to the competitive and diverse food market. An increased consumer and regulatory focus on food safety follows a series of food safety breakdowns in various countries. A variety of processing inspections and labelling requirements exist for domestic and foreign markets. In Canada, the bison industry has adopted a modified Canadian beef industry grading system to link producer return to carcass quality. Research into meat quality issues is being carried out, in response to the industry's recognition of the importance of consistent meat quality to consumer consumption decisions and consequently to the industry's long term viability (Duckworth, 2001; Dhanda, et al.).

The 20 percent per year increase in bison production anticipated by industry experts over the next few years makes it a challenging task to find sufficient new markets for the meat (Bell, 2001). How to undertake "marketing" of bison products is an issue with which the industry currently struggles. Some industry participants advocate aggressive promotion in the form of advertising. However, the effectiveness of such a campaign would be contingent on a multitude of factors including the ability of the bison industry to first accurately identify target markets. Very little consumer demand research has been carried out for bison, making it possible to do only generic advertising that is not targeted at specific consumer groups or products. An advertising strategy incurs costs. An indication of the potential returns from promotional activities is necessary before it can be determined whether this would be a cost-effective use of industry resources.

3. MEASURING CONSUMER PREFERENCES

To date, research into consumer demand for, and attitudes towards, specialized livestock products has been limited and has been primarily qualitative rather than quantitative in nature (PPD Technologies Inc., 1998; Ernst and Young, 1998; Simba Enterprises Ltd., 1997; Gillis, 1994; Torok et al., 1996; Torok et al., 1998). As a further step in building a base of knowledge about the potential market for bison, this study focuses on the *characteristics* or *attributes* that consumers would consider important when purchasing bison meat.

When someone buys say, a new car, they are in fact buying a bundle of attributes, including seating capacity, engine size, anti-lock brakes, four wheel drive, fuel efficiency, etc. Different consumers are looking for different attributes or features. They will have relatively strong preferences for some attributes, while they may not be interested in and would not pay more for other features of a new car. By obtaining information on consumers' preferences for different vehicle attributes we can build a clearer picture of

the potential market for cars with certain features and the consumer groups (segments) that would be most likely to buy these cars. Similarly, we can build a picture of the potential demand for bison by focusing on attitudes towards specific *attributes* or characteristics of bison products. A key objective of this research was to gather information about consumer preferences for different bison characteristics. Identifying these characteristics is a first step toward profiling the potential consumer of bison meat products and estimating the expected demand and price in the target markets identified. Socio-economic profiles of consumers should aid the industry in identifying market segments and in guiding future product development and promotional activities.

For some products that are widely available in the marketplace, information on sales, retail prices and how demand is affected by changes in prices is readily available and can be used to estimate market potential. For products in emerging markets, however, little retail data is available and other marketing research techniques must be used. In this case, it was determined that a 'stated preference' methodology, in which consumers are asked to state their preferences for different types of bison products, was the most appropriate. The stated preference technique used in this research is known as Conjoint measurement. Conjoint measurement provides an assessment of how consumers perceive different goods based on the nature (or level) of the attributes that these goods contain. The model is based on the assumption that a product is a bundle of identifiable attributes and that the consumer's perception of the product is determined by the different levels and combination of these attributes (Steenkamp, 1987). The consumer's overall judgement (rating or ranking) of a variety of hypothetical product alternatives with various attribute combinations is obtained. This overall 'product' rating is then decomposed into the relative contribution of each attribute level (Steenkamp, 1987). It is then possible to analyse how the consumer trades off between the attributes when making a consumption decision (Fenwick, 1978).

Data is collected through a survey in which each individual respondent rates or ranks a variety of attribute combinations (profiles) making it possible to develop a separate predictive preference model for each respondent (Hair et al., 1992). These results are then aggregated across respondents for the purpose of estimating market share or used for market segmentation by identifying consumers with similar preferences.

4. PILOT SURVEY

The research was conducted in two phases. First, a pilot study[2] was used to assist in identifying key bison attributes and to experiment with different attribute combinations. Three separate survey instruments[3] were used, each with a different set of attributes (Table 1) and each administered to a third of the sample. Based on the results of other red meat studies (Lusk and Fox, 2000, Gillespie et al., 1998, Umberger et al., 2000) and the expectations of bison industry experts (Conacher, 2000), four categories of bison meat attributes were determined to be potentially important in the meat purchase decision. These were economic; image; health; and palatability attributes. Studies have shown that palatability is a prime concern of consumers when eating meat (Umberger et al., 2000). Three indicators of palatability were included – one in each of the three

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[2] Full details of the pilot study are available in Sanderson (2001).
[3] A copy of the three experimental conjoint designs used in the pilot survey is provided in Appendix A.

experimental survey designs used in the pilot study: tenderness, flavour and juiciness (Umberger et al., 2000). The price of bison currently varies considerably from that of traditional red meats. Due to the expected importance of price in food purchases, it was included in the study as an economic indicator, with each survey design using a different set of price levels.

The generic promotional efforts of the bison industry have included emphasis on various aspects of bison, including the image of bison as a unique, North American heritage food, its low fat content, and the claim that bison is lower in cholesterol relative to other red meats (Conacher, 2000). Fat, cholesterol and protein content were included in each of the experimental survey designs to represent the potential health benefits associated with consuming bison meat. The image attributes of delicacy/special occasion meat, uniquely North American, and locally produced (Alberta) were included in the three designs. The product was specified as an 8-oz Round steak.

Table 1. Experimental Designs: Pilot Study

Experimental Design	Attributes	Levels
Design 1 (Red Meat)	Price for 8-oz. round steak Fat Content Uniquely North American Flavour	$2.50, $3.75, $5.00 Low, High Yes, No Mild, Slightly intense, Very intense
Design 2 (Red Meat)	Price for 8-oz. round steak Protein Level Delicacy/special occasion meat Tenderness	$2.50, $5.00, $7.50 Low, High Yes, No Slightly tender, Tender, Very tender
Design 3 (Bison)	Price for 8-oz. round steak Cholesterol Level Locally Produced in Alberta Juiciness	$2.00, $2.50, $3.00 Low, High Yes, No Slightly juicy, Juicy, Very juicy

In addition to the three experimental designs for the conjoint analysis, all respondents were presented with a list of 15 individual red meat attributes and asked to score the importance of each attribute in their red meat purchase decision[4]. The pilot survey was carried out in Alberta in December 2000. The preliminary results from the pilot study provided insights into the effects of different attribute combinations and the specification of attribute levels, which assisted in the design of the main survey instrument. The palatability, price and health related attributes were relatively important, while responses indicated that the image attributes were relatively less important in the purchase and consumption decision.

The relative importance of the price attribute appeared to be a function of the magnitude of the range and maximum level offered to respondents in each conjoint study

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[4] The same question was used in the principal survey, which is presented in Appendix B.

design. Although each combination included different health, image and palatability attributes, the relative importance of price differed among the three designs. In particular, price was less important in Design 3. This indicates that when price is specified at a relatively low level (and closer to current beef prices), it will be less important as a determinant of consumer purchasing behaviour. These findings were used to select the attributes and attribute levels used in the principal study.

5.   PRINCIPAL STUDY

5.1 Experimental Design

Based on results from the pilot study, fat content, price, tenderness and convenience to prepare were the attributes chosen for the main conjoint experiment[5]. For this study, respondents were asked to consider a bison striploin steak. A striploin steak was chosen because it is a high value meat product and a cut with which most consumers would be familiar. Table 2 lists the attributes and corresponding attribute levels used in the conjoint analysis.

Table 2. Experimental Design: Principal Study

Bison Attributes	Levels
Fat Content	Equal to beef, 25% less than beef, 50% less than beef
Price for 8-oz. striploin steak	$5.00, $7.50, $10.00
Tenderness	Slightly tender, Tender, Very tender
Time required to both prepare and cook	Less than 15 mins, Between 15 and 30 mins, More than 30 mins.

Fat content was chosen because of its relative importance in the pilot study, both in the conjoint and the individual attribute analyses. Bison contains less fat than other traditional meats, so the importance consumers' place on this attribute is potentially relevant to the decision to buy bison. The pilot survey used two fat content attribute levels ("high" and "low"). These descriptions were refined in the main survey to avoid the use of two extremes and so as to provide respondents with a frame of reference. Thus, fat content was described relative to beef (equal to beef, and 25% and 50% less than beef).

The pilot study had indicated that price was probably an important attribute, therefore, it was included in the main study as an economic indicator. The price attribute was based on observed retail prices for a bison striploin steak and an equivalent beef striploin steak. Current retail prices for an 8-oz. beef striploin steak were observed at $5.00 and bison steak at $10.00. The 8-oz. steak size represents an average portion size that respondents should be able to visualise. To provide a frame of reference, respondents were told the current price of an 8-oz. beef striploin steak was $5.00.

Tenderness (a palatability attribute) was included as a result of its relative importance in the pilot conjoint analysis and individual attribute ratings. Tenderness is considered to be a challenge for the bison industry given the lean nature of the meat. The importance of this attribute is relevant to industry product development and marketing

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[5] Full details of the principal study are available in Sanderson (2001).

strategies. Tenderness was specified at the same three levels as in the pilot study with "slightly" and "very" used to represent low and high levels of the attribute respectively. No problems were identified with these descriptions in the pilot study.

As a result of the low relative importance accorded the image attributes in the pilot conjoint analysis and individual attribute scoring, these attributes were not included in the principal study. Instead, "convenience to purchase" and "convenience to prepare" appeared to be important in the individual attribute scorings from the pilot study. "Time required to prepare and cook" was therefore included as the fourth attribute. Bison is a relatively lean meat, requiring additional care and time in preparing and cooking to ensure that it does not become dry and tough. Consumer tolerance for additional preparation time relative to other meats has important implications for product development strategies and processing methods. Industry interest in developing trim and other low value cuts was a factor in deciding to include this attribute. The importance of the convenience attribute should be a consideration when determining the type of lower value cuts to be developed. To ensure consistent interpretation and evaluation by respondents, convenience was represented by the time required to both prepare and cook the meat in minutes.

As can be seen from Table 2, each attribute was specified as having either two or three levels (e.g. 'slightly tender', 'tender' or 'very tender' for the tenderness attribute). A series of hypothetical product *profiles* were created using different combinations of these attribute levels (e.g. an 8-oz bison striploin priced at $7.50, with 25% less fat content than beef, slightly tender and requiring more than 30 minutes to prepare and cook). Eleven profiles were generated using different combinations of the attribute levels presented in Table 2[6]. Appendix B contains the survey instrument, including the profile descriptions used in the conjoint analysis.

5.2 Principal Study Data Collection

The survey was administered in Alberta to 154 respondents in April 2001. The Food Processing and Development Centre (FPDC) at Leduc, Alberta solicited participants from their database by phone and e-mail and selected respondents to represent as closely as possible the Canadian adult population based on gender, age, and education. Adults between the ages of 20 and 60 participated in the study under the supervision of FPDC staff at the Leduc centre and at satellite consumer testing locations in Edmonton. A comparison of the survey population and the Canadian population using 1996 Statistics Canada data on age, gender, education, average income and household size suggests that the sample population is generally representative of the Canadian population between 20 and 60 years of age. The sample population had a statistically significant higher education attainment than the general Canadian population and one-person households were under represented while four-person households were over represented in the sample.

The survey instrument was divided into four parts (see Appendix B): 1) 15 individual red meat attributes, which respondents were asked to rate on an importance

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[6] The total number of potential profiles is determined by the number of attributes and attribute levels, therefore, it is necessary to minimise the number of attribute levels to avoid information overload for respondents. A fractional-factorial design was used to select the product profiles using SPSS conjoint software. See Sanderson (2001) for details.

scale; 2) the conjoint experiment; 3) statements aimed at gauging respondents' perceptions about bison[7]; and 4) socio-economic data collection. Respondents were not asked to do a taste test, primarily as the survey was intended to ascertain attitudes towards bison in general rather than assessing preferences for a specific product, but also due to resource limitations.

5.3 Principal Study Results

5.3.1 Individual Attribute Importance Scores

Before completing the conjoint survey question, respondents were asked to rate the importance of 15 *individual* red meat attributes on a 9-point scale where 1 was "not important" and 9 was "very important". The average of these explicit attribute ratings for the whole sample is provided in Figure 2.

Figure 2. Individual Attribute Importance Scores
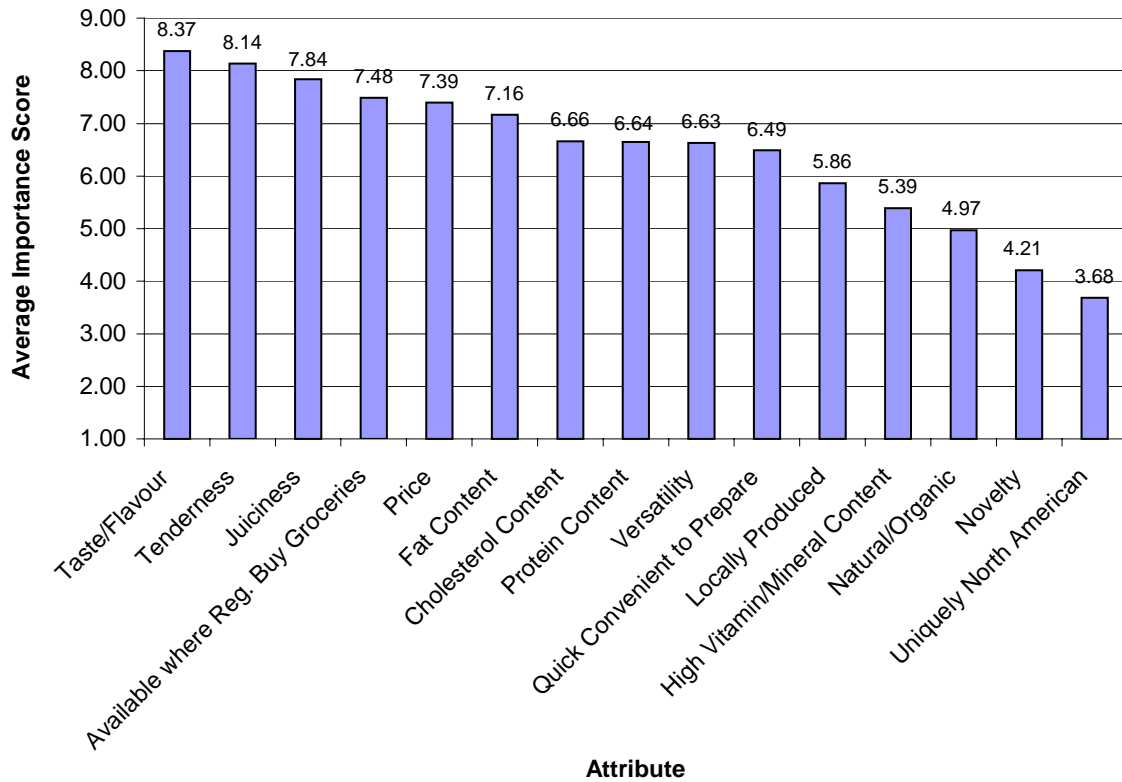
The palatability attributes of flavour, tenderness and juiciness received high importance ratings followed by "available where you regularly buy groceries" and price. Fat content was rated close to price followed by cholesterol levels, protein content and versatility. The image attributes of uniquely North American, locally produced and

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[7] Through consultation with industry stakeholders it was determined there was interest in finding out how consumers perceive bison and the bison industry. To address this need respondents were asked to agree or disagree with eight statements about the image of bison meat and the bison industry.

delicacy/special occasion meat were regarded as relatively unimportant by respondents when purchasing a red meat.

While this information is useful in providing a guide as to what consumers think are the important factors influencing their purchase decisions, it does not capture the implicit trade-offs that occur when consumers *actually* make a purchase decision. In other words, a consumer may state that tenderness, low cholesterol and price are all very important to a decision whether or not to purchase red meat. However, this does not tell us whether a consumer would accept paying a higher price if he could have more tenderness and/or lower cholesterol. To evaluate these 'trade-offs', we must turn to the conjoint analysis.

5.3.2 Conjoint Results

The results of the conjoint analysis allow the researcher to determine the *relative* importance of each product attribute. In the conjoint question (Appendix B), respondents were asked to rate the extent to which each bison product profile was "least preferred" to "highly preferred". Recall that each profile consists of a bundle of attributes. Therefore, the respondents' ratings for the profiles can be decomposed into the *implicit* relative importance of each attribute, as shown in Figure 3. On average respondents implicitly considered price to be the most important attribute, followed by tenderness, fat content and convenience to prepare.

Figure 3: Relative Importance of Bison Attributes: Principal Study (n=154)
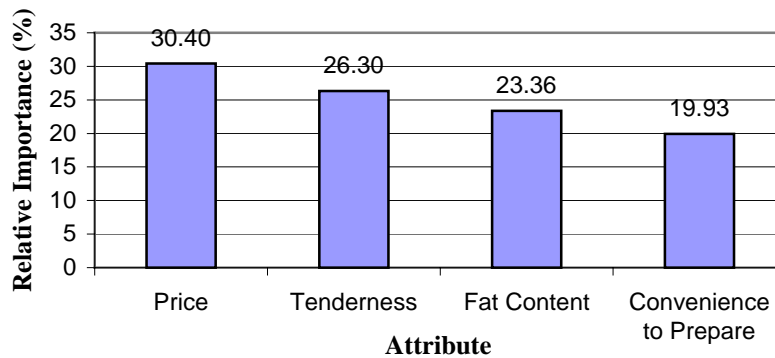
Conjoint analysis generates 'part-worth' values for each attribute level, which form the basis of the relative importance calculations in Figure 3. The part-worth values are presented in Table 3.

Part-worth estimates can be used to calculate the *total worth* (or value) to the respondent of each profile used in the survey. This makes it possible to see how the respondents' implicitly trade-off among the attributes. Adding the average part-worths generated by the conjoint analysis and the constant value, a total worth can be assigned to each profile. This can be calculated for the profiles actually used in the survey or for any hypothetical product profile, for example, the total worth calculation for the most preferred attribute combination is provided in Table 4. The total worth calculation for each profile included in the survey instrument is presented in Table 5. For ease of

reference, the profiles are listed in descending rank order based on the total worth for nine of the profiles rated by respondents[8].

Table 3. Average Part-worths for Each Attribute Level

Attribute Level	Part-worth Value	Relative Importance of Attribute
Constant	7.0418	
Price		30.40
$5.00	1.5599	
$7.50	0.1876	
$10.00	-1.7475	
Tenderness		26.30
Slightly Tender	-1.3189	
Tender	-0.0123	
Very Tender	1.3066	
Fat Content		23.36
Equal to Beef	-0.9964	
25% Less than Beef	-0.0072	
50% Less than Beef	1.0036	
Time Required to both Prepare and Cook Meat		19.93
Less than 15 minutes	0.5837	
Between 15 and 30 minutes	0.2613	
More than 30 minutes	-0.8449	

Table 4. Total Worth for the Most Preferred Attribute Combination

Most Preferred Combination		
Fat Content	50% less than beef	1.0036
Price	$5.00	1.5599
Tenderness	Very tender	1.3066
Time required to both prepare and cook	Less than 15 minutes	0.5837
	Constant	7.0418
	Total Worth	**11.4956**

The total worth calculations allow the profiles to be ranked, thereby identifying how respondents trade-off between attribute levels. For example, although price was given the highest overall importance rating, Profile 4 which has a price of $7.50, has a higher total worth than Profile 1 with a price of $5.00 (see Table 5). This demonstrates that price alone does not determine consumer preferences. Although both profiles contain the same fat content (50% less than beef), the bison in Profile 4 is

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[8] Two profiles are omitted. These are known as 'hold-out' profiles and are not used in calculating the part-worths but are instead used to validate the predictive power of the conjoint model (Sanderson et al., 2001; Hair et al., 1992).

Table 5. Total Worth for the Profiles Evaluated by Respondents

Profile 3		
Fat Content	25% less than beef	-0.0072
Price	$5.00	1.5599
Tenderness	Very tender	1.3066
Time required to both prepare and cook	Between 15 and 30 minutes	0.2612
	Constant	7.0418
	Total Worth	**10.1623**
Profile 4		
Fat Content	50% less than beef	1.0036
Price	$7.50	0.1876
Tenderness	Very tender	1.3066
Time required to both prepare and cook	Less than 15 minutes	0.5837
	Constant	7.0418
	Total Worth	**10.1233**
Profile 1		
Fat Content	50% less than beef	1.0036
Price	$5.00	1.5599
Tenderness	Tender	0.0123
Time required to both prepare and cook	More than 30 minutes	-0.8449
	Constant	7.0418
	Total Worth	**8.7727**
Profile 8		
Fat Content	Equal to beef	-0.9964
Price	$5.00	1.5599
Tenderness	Slightly Tender	-1.3189
Time required to both prepare and cook	Less than 15 minutes	0.5837
	Constant	7.0418
	Total Worth	**6.8701**
Profile 7		
Fat Content	Equal to beef	-0.9964
Price	$7.50	0.1876
Tenderness	Tender	0.0123
Time required to both prepare and cook	Between 15 and 30 minutes	0.2612
	Constant	7.0418
	Total Worth	**6.5065**

Profile 5

Fat Content	25% less than beef	-0.0072
Price	$10.00	-1.7475
Tenderness	Tender	0.0123
Time required to both prepare and cook	Less than 15 minutes	0.5837
	Constant	7.0418
	Total Worth	**5.8831**

Profile 2

Fat Content	50% less than beef	1.0036
Price	$10.00	-1.7475
Tenderness	Slightly Tender	-1.3189
Time required to both prepare and cook	Between 15 and 30 minutes	0.2612
	Constant	7.0418
	Total Worth	**5.2402**

Profile 6

Fat Content	25% less than beef	-0.0072
Price	$7.50	0.1876
Tenderness	Slightly Tender	-1.3189
Time required to both prepare and cook	More than 30 minutes	-0.8449
	Constant	7.0418
	Total Worth	**5.0584**

Profile 9

Fat Content	Equal to beef	-0.9964
Price	$10.00	-1.7475
Tenderness	Very tender	1.3066
Time required to both prepare and cook	More than 30 minutes	-0.8449
	Constant	7.0418
	Total Worth	**4.7596**

described as very tender and the time required to prepare and cook is less than 15 minutes. In Profile 1 the bison meat is described as tender and requiring more than 30 minutes to prepare and cook. This implies that respondents would be willing to pay more for bison in return for increased tenderness and reduced preparation and cooking time.

However, the limitation and sensitivity of consumers' willingness-to-pay is demonstrated by the rankings of Profiles 7 and 5. Profile 7 has fat content equal to beef, priced at $7.50, the meat is described as tender and the time to prepare and cook is 15 to 30 minutes. Profile 5 describes bison with fat content of 25% less than beef, priced at $10.00, tender and requiring less than 15 minutes to prepare. Both profiles have the same level of tenderness. However, Profile 5 offers a lower fat content and a lower preparation time but at the cost of an increase in price from $7.50 to $10.00. We find that Profile 7 achieves a higher total worth and is ranked above Profile 5. This implies that respondents were unwilling to accept the increase in price from $7.50 to $10.00 in exchange for a

25% decrease in fat content compared to beef and a reduction in preparation and cooking time.

As with the most preferred combination, it is possible to construct the estimated total worth for product profiles other than the profiles rated by respondents using the part-worth calculations reported in Table 3. This is useful for evaluating other attribute trade-offs. For example, a hypothetical product with fat content at 25% less than beef, priced at $7.50, slightly tender, and prepared and cooked in less than 15 minutes would have a total worth of

$$(-0.0072) + (0.1876) + (-1.3189) + (0.5837) + (7.0418) = 6.487$$

which represents the sum of the part-worth calculation for each attribute level and the constant. Comparing this to Profile 8 (evaluated by the respondents) we can observe the implicit trade-off between price and fat content. Profile 8, with a total worth of 6.8701 has fat content equal to beef, is priced at $5.00, is slightly tender and is prepared and cooked in less than 15 minutes. Therefore, we can say that when fat content changes from equal to beef to 25% less than beef but price is increased from $5.00 to $7.50 in the hypothetical product profile, the total worth of the product falls. The increased benefit from a 25% reduction in fat relative to beef was not enough to offset the increase in price from $5.00 to $7.50.

Now, if another hypothetical product is considered where fat content is 50% less than beef, price is $7.50, the meat is slightly tender and it is prepared and cooked in less than 15 minutes, the total worth calculation would be

$$(1.0036) + (0.1876) + (-1.3189) + (0.5837) + (7.0418) = 7.4978.$$

Comparing this again to Profile 8 with a total worth of 6.8701 it is clear that this hypothetical product profile would be preferred to Profile 8. This implies that while the trade-off between 25% less fat content relative to beef and a price increase from $5.00 to $7.50 would not be accepted, a 50% reduction in fat content relative to beef would be sufficient to offset the effect of a price increase from $5.00 to $7.50. We can conclude that consumers are willing to pay more for bison relative to beef for a sufficient reduction in fat content.

At higher prices, however, consumers become more price sensitive and are less willing to trade-off higher prices for lower fat content. This can be seen by comparing Profile 8 with a hypothetical product profile consisting of 50% less fat content relative to beef, a price of $10.00, slightly tender and cooking time of less than 15 minutes. The new profile has a total worth of

$$(1.0036) + (-1.7475) + (-1.3189) + (0.5837) + (7.0418) = 5.5627$$

This time the negative part-worth of the price increase from $5.00 to $10.00 was larger than the positive value, or worth, from reducing fat content from equal to beef to 50% less than beef. The result is that Profile 8 is preferred to this particular hypothetical product.

These implicit trade-offs suggest that consumers are willing to pay more for the attributes of tenderness, reduced fat content and convenience to prepare but only within a limited price range. Understanding the importance of the attributes and the trade-offs that consumers make between the attributes is significant when looking at options for industry production, processing and market development. This research begins to provide some insight into the willingness-to-pay for reduced fat content, tenderness and convenience to prepare as the "trade-offs" between these attributes are observed.

In the explicit attribute ratings (Figure 2), tenderness appears to be more important than price, which is not consistent with the results of the conjoint analysis (Figure 3). Why is this? The answer lies in the problems with simply asking respondents to rate the importance of individual product attributes in isolation (Figure 2), rather than presenting them with a 'bundle' of attributes as is the case when they actually make a purchase decision (Figure 3). Respondents were more sensitive to price when it was high relative to other comparable meat products as was the case in the conjoint analysis (Figure 3). When no price range is provided and price is possibly assumed to be within some implicit "acceptable" range, price was not rated as important as the palatability attributes of flavour, tenderness and juiciness (Figure 2). The conjoint analysis is a more realistic representation of the consumer purchase decision. The explicit importance rating of individual attributes alone may not accurately reflect consumer preferences. Allowing consumers to respond to realistic, whole product descriptions in a conjoint experiment reveals the implicit trade-offs that consumers make among products based on different attributes.

5.3.3. Cluster Analysis

Conjoint analysis generates results for each individual respondent that are then aggregated to provide the average sample responses reported above. However, it is also possible to derive information about potential consumer market segments by clustering individual respondents into groups with similar stated preferences. Cluster analysis was performed on the conjoint data, resulting in eight clusters – or groups – of respondents with similar preferences. Table 6 summarizes the relative importance of the attributes for each of the eight clusters. Figure 4 provides a graphical representation of the preferences of the eight clusters and the entire sample.

Table 6. Relative Importance of Attributes By Cluster Groups (%)

Clusters	Price	Tenderness	Fat Content	Convenience	
Group 1	17	14	15	54	(n=8)
Group 2	16	55	18	11	(n=17)
Group 3	40	19	13	28	(n=30)
Group 4	30	24	30	15	(n=25)
Group 5	15	16	52	17	(n=21)
Group 6	56	17	19	8	(n=23)
Group 7	13	27	24	37	(n=12)
Group 8	32	44	11	13	(n=18)
Sample	30	26	23	20	(n=154)

Average				

Using the socio-economic information that was gathered with the survey we can develop a "profile" of each cluster. The key features of each cluster are summarized in Table 7.

Figure 4: Relative Importance of Bison Attributes by Clusters
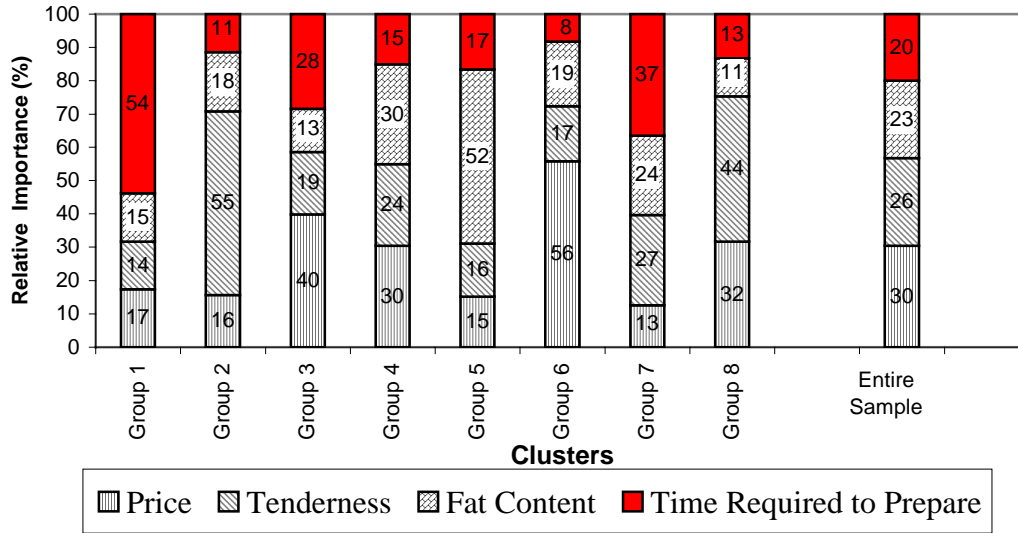
Table 7. Profile of the Eight Clusters

Cluster	Key Socio-economic Features
Group 1:'Convenience First'	Predominantly male, younger, lower education, middle income, frequent red meat eaters
Group 2: 'Palatability Rules'	Primarily between 30 and 49 years old, higher income, frequent red meat eaters
Group 3: 'Fast and Economical'	High percentage of 30-39 year olds, higher education, middle income, high percentage of daily red meat eaters
Group 4: 'Healthy at a Price'	More females, higher education, middle income, almost half advised to reduce fat or cholesterol intake by physician
Group 5: 'Low Fat Rules'	Primarily male, younger, middle income, high representation of infrequent red meat eaters
Group 6: ' Price Conscious'	High percentage of 40–49 year olds, higher education, middle income
Group 7: 'Fast yet Tasty and Healthy'	High percentage of 40-49 year olds, high representation of incomes between $20,000 and $59,000
Group 8: 'Tender but frugal'	Higher education and income

Group 1 ("*Convenience First*") placed a great deal of importance on convenience to prepare (54%) (Sanderson and Hobbs, 2001). The importance of this attribute to group 1 was more than 2.5 times higher than for the entire sample. Given that this was a small cluster of eight respondents, more information about this group of consumers is needed before any specific conclusions can be drawn. Clearly, this group was primarily concerned with convenience and less concerned with price, fat content and tenderness. Processed or value added bison products that emphasise convenience could be marketed to this group at a price premium.

Tenderness was of paramount importance to Group 2 ("*Palatability Rules")* with an average importance rating (55%), more than twice that for the entire sample. For the bison industry this offers insight into a potential consumer market segment if product and processing development is undertaken to improve the tenderness of bison meat relative to other meat products. The low relative importance of price suggests that this consumer group may be willing to pay a premium for products that are particularly tender.

For group 5 ("*Low Fat Rules*") fat content was more than twice as important than for the whole sample. Convenience, tenderness and price all received low relative importance ratings. Bison is considered to be a healthy red meat that is low in fat. Identification of a consumer group that places more emphasis on fat content than the other attributes should be of interest to the bison industry as a potential target market segment. The low relative importance placed on price may be an indication of a willingness-to-pay a price premium for a low fat bison product.

Group 6 ("*Price Conscious*") gave price the highest relative importance rating, with the attributes of fat content, tenderness and convenience to prepare emerging as considerably less important in the consumers' product choice. This tells the bison industry that meat products must be competitively priced to market to this price-conscious group of consumers.

The differences in the attribute importance ratings for each of the clusters reinforces the importance of identifying market segments and tailoring products and marketing strategies to the specific needs of the different target consumers groups. Given the small number of respondents in the individual clusters, further study is required to determine the validity of the consumer profile developed for each of the clusters and to gather more detailed information about the consumers within these clusters. However, this information presents a preliminary picture of the potential consumer market segments for bison.

5.3.4 Bison Image

To obtain information on the public image of bison meat and the bison industry, survey participants were asked to either agree or disagree with eight statements (see Appendix B for details of the survey questions). The results are summarized in Figure 5.

These results indicate that consumers have a variety of perceptions about bison, some of which are not accurate. With 21 percent agreeing and 19 percent neither agreeing or disagreeing with the statement that bison are an endangered species there is a need to educate the public about bison production if the meat industry is to grow. Although this issue was not explored with the survey respondents, it is possible that the "heritage food" image promoted by the industry may bring with it the reminder that part of the "North American heritage" is also that the species was almost hunted to

extinction[9]. The low 12 percent agreement with the perception of bison as resistant to most livestock diseases suggests that respondents have limited knowledge of bison as a livestock animal. Recent isolated incidents of tuberculosis in the Canadian bison herd may also have contributed to the uncertainty about the health of these animals. The 45 percent agreement with the image of bison as having a "gamey" or wild meat taste could pose a challenge for gaining consumer acceptance. The 34 percent agreement with statement that bison meat is tough and 40 percent agreement with the image of bison as a dry meat should be considered when the industry looks at product development and marketing. Recent research has shown that marination can significantly increase tenderness for lower value bison cuts (Dhanda, 2001).

Figure 5. Public Perceptions of Bison
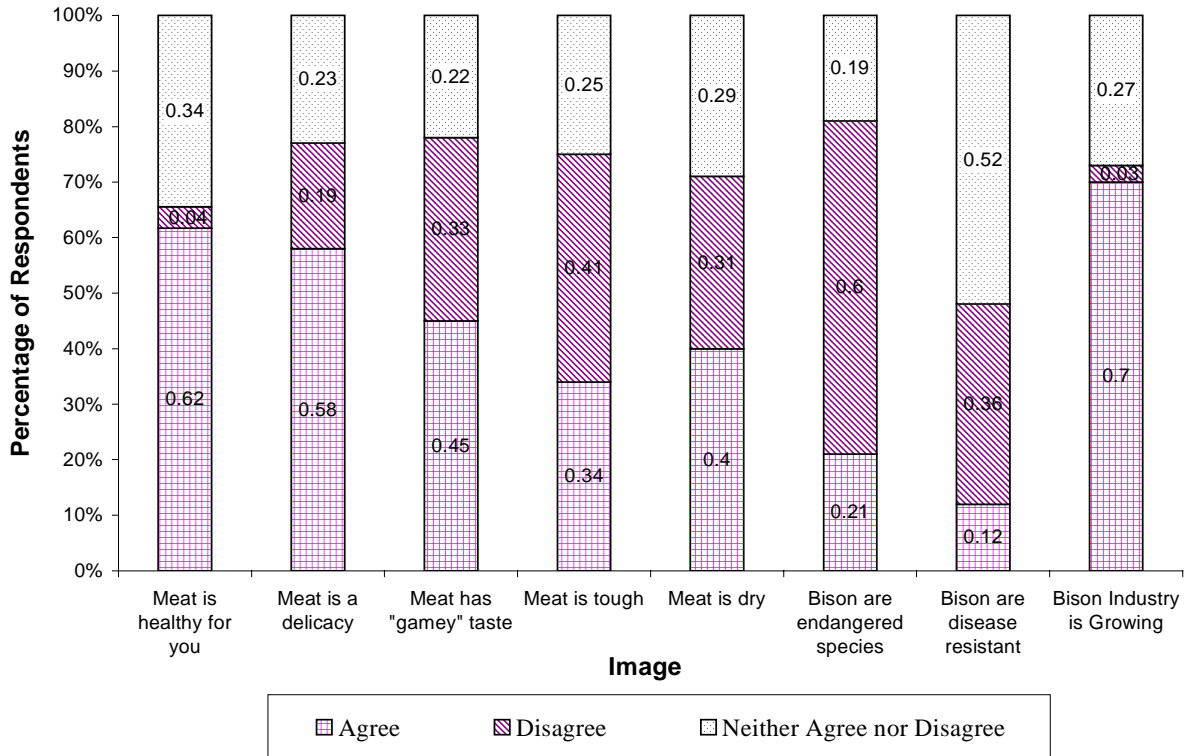
Of the whole sample, 56 respondents, or just over one-third, had never tried bison meat. The responses to the image statements were broken down into two groups based on whether the respondent had eaten bison to determine if the perceptions of the industry and the meat differed among the two groups. Figure 6 compares the responses of the two groups to the image statements. The first bar (bold pattern) in each pair represents the responses of those who had never tried bison meat while the second bar (light pattern) represents the responses of those who had eaten it in the past.

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[9] This is no longer the case, with an estimated 99,000 bison on farms in Canada in 1999 and 175,000 head in the US (Conacher, 2000; Albrecht, 2000).

A larger percentage of those individuals who had never tried bison (27%) believed that bison were currently an endangered species compared with those who had tried it (18%). Negative images of bison meat such as the meat is "dry", "gamey tasting" and "tough" were more prevalent among individuals who had never tried bison. Clearly, the negative images of bison may contribute to the consumer decision whether to try the meat. Alternatively, it is possible that opinions about the meat may be changed after trying it. These results provide some indication of public perceptions, however further research would be needed to determine what affects public perceptions of bison, and how positive images can be enhanced and misperceptions corrected.

Figure 6. Public Perceptions of Bison by Whether Respondent Had Tried Bison
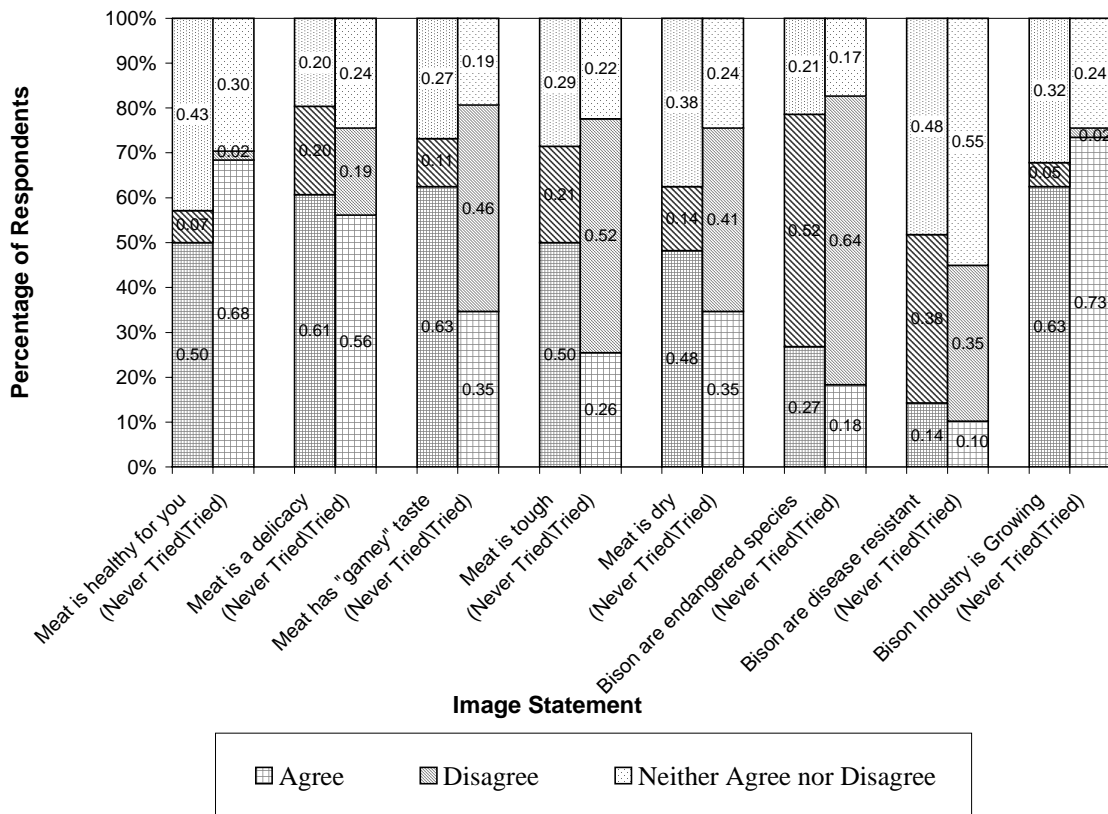
6. IMPLICATIONS FOR INDUSTRY DEVELOPMENT AND FUTURE MARKET RESEARCH

The results of the pilot and principal surveys revealed information about consumer preferences for individual attributes that can assist industry participants in making industry development decisions in production, processing, distribution and marketing. When asked to assess explicitly the importance of individual attributes, consumers consistently placed emphasis on the palatability attributes of taste/flavour,

tenderness and juiciness. These attributes are related to the quality of the meat and provide insight into the qualities that consumers are looking for in a red meat.

Convenience to purchase, price and fat content were also considered important. Convenience to purchase a red meat product rated very highly in the explicit individual attribute scoring. Comments by respondents on some of the surveys suggested that consumers are not familiar with where bison is available for purchase and some suggested that the lack of availability where they regularly shop was a deterrent to purchasing bison meat. Industry stakeholders should carefully consider these consumer priorities to ensure these preferences are incorporated into any production, processing, distribution or marketing development activities. Presently, bison meat supply does not warrant widespread supermarket distribution, as volumes are not sufficient to provide the necessary supply of meat to large distributors. It is important for the industry to know if consumers are willing to pay more, and whether they would trade-off other attributes in favour of convenience to purchase the product. Such trade-offs are important when developing a distribution strategy for bison products. Conversely, we need to know whether those who are less price sensitive are perhaps more likely to purchase meat from a specialty store, making this a more appropriate distribution channel for a high-end meat cut.

The results of the conjoint experiment revealed a consumer willingness-to-pay for more tenderness, reduced fat content and convenience to prepare. However, limitations on the willingness-to-pay or sensitivity to significant price changes were also observed, demonstrating that the "trade-offs" between price and other attributes are not static but rather change depending on the level of prices being considered. Although for the whole sample, price emerged as the relatively most important attribute, analysis based on the part-worth values revealed that consumers do trade-off between attributes and have clear preferences for specific combinations of attribute levels. In particular, a consumer willingness-to-pay for reduced fat content relative to beef and increased tenderness was identified among specific consumer market segments.

For the bison industry, this trade-off between price and the other product attributes provides important insights into the consumer's willingness-to-pay for these features of bison products. Industry development activity aimed at improving palatability, such as tenderness, flavour and juiciness incurs costs. These increased costs must be weighed against the potential increase in returns from the marketplace to determine whether there is a sufficient willingness-to-pay among consumers for improved palatability.

As the supply of bison meat increases and the breeding market no longer dominates the bison industry, price will be determined to a greater extent by whether the industry is able to provide bison products with combinations of attributes that are valued highly by consumers relative to competitor food products. This research confirms that this is achieved through a combination of price with other attributes including but not limited to taste/flavour, tenderness, juiciness, convenience to purchase and prepare, fat content, cholesterol content, and protein content. The importance of price in the evaluation of bison meat and other red meats is dependent on the price range presented to respondents. Beef and possibly other red meats are close enough substitutes for bison that any large price premiums are likely to be unacceptable to many consumers. Given

this information, the bison industry may be pushing the limits of consumer price sensitivity at the current prices charged for the quality of bison available on the market.

Specific sub-groups of the sample populations were identified for whom price was less important relative to other product attributes. Further exploration of price sensitivity would be required to determine more precisely the price premium these consumers may be willing to pay for health, convenience and palatability attributes.

Important differences in the bison meat and industry images were observed between those who had and had not tried bison meat. A more detailed study is warranted of consumer perceptions regarding bison meat and the bison industry and how these perceptions influence the purchase and consumption decision.

The long-run viability of the industry is dependent on developing markets for bison products and the capacity to competitively service those markets. The industry needs to understand the priorities and preferences of the consumer and then undertake industry and product development activities based on this information to present products that appeal to consumers and increase returns to the industry. The profitability of specific consumer market segments needs to be evaluated, understanding that the largest market segments are not necessarily the most profitable. Given the limited supply of bison meat, it will be important to choose target markets that the industry can adequately supply and service at a profit. The cluster analysis reveals that there are exciting opportunities for the industry to develop products that appeal to specific consumer segments. This research represents a first step towards understanding consumer preferences for bison products with different attributes, and provides guidance for future market research initiatives in the bison industry.

APPENDIX A: PILOT SURVEY
CONJOINT ANALYSIS EXPERIMENTAL DESIGNS

EXPERIMENTAL DESIGN 1

Listed below are 11 "profiles" describing a **red meat** product. Imagine you are purchasing an 8 oz. round steak with the characteristics identified in each profile and rate your preference for the **red meat** in each case. For reference purposes an equivalent 8 oz. round beef steak would cost $2.50 per round steak. (Round steak is often used in stews, marinated for use on kabobs, or oven roasted sometimes in a sauce)

Please rate each of the eleven profiles on a scale of 1 to 12, where 1 = LEAST PREFERRED and 12 = MOST PREFERRED.

You are encouraged to use the full scale from 1-12 when rating the different cases.

Profile	PRICE OF MEAT	FAT CONTENT	UNIQUELY NORTH AMERICAN	TASTE/FLAVOUR	(please circle one score for each line) Least Preferred ... Most Preferred SCORE
1	$5.00/steak	LOW	NO	VERY INTENSE	1 2 3 4 5 6 7 8 9 10 11 12
2	$5.00/steak	LOW	YES	SLIGHTLY INTENSE	1 2 3 4 5 6 7 8 9 10 11 12
3	$3.75/steak	LOW	YES	SLIGHTLY INTENSE	1 2 3 4 5 6 7 8 9 10 11 12
4	$5.00/steak	HIGH	YES	MILD	1 2 3 4 5 6 7 8 9 10 11 12
5	$3.75/steak	LOW	NO	MILD	1 2 3 4 5 6 7 8 9 10 11 12
6	$3.75/steak	HIGH	YES	VERY INTENSE	1 2 3 4 5 6 7 8 9 10 11 12
7	$2.50/steak	HIGH	NO	SLIGHTLY INTENSE	1 2 3 4 5 6 7 8 9 10 11 12
8	$2.50/steak	LOW	YES	MILD	1 2 3 4 5 6 7 8 9 10 11 12
9	$2.50/steak	LOW	YES	VERY INTENSE	1 2 3 4 5 6 7 8 9 10 11 12
10	$2.50/steak	LOW	NO	MILD	1 2 3 4 5 6 7 8 9 10 11 12
11	$2.50/steak	HIGH	NO	MILD	1 2 3 4 5 6 7 8 9 10 11 12

EXPERIMENTAL DESIGN 2

Listed below are 11 "profiles" describing a **red meat** product. Imagine you are purchasing an 8 oz. round steak with the characteristics identified in each profile and rate your preference for the **red meat** in each case. For reference purposes an equivalent 8 oz. round beef steak would cost $2.50 per round steak. (Round steak is often used in stews, marinated for use on kabobs, or oven roasted sometimes in a sauce)

Please rate each of the eleven profiles on a scale of 1 to 12, where 1 = LEAST PREFERRED and 12 = MOST PREFERRED.

You are encouraged to use the full scale from 1-12 when rating the different cases.

Profile	PRICE OF MEAT	PROTEIN LEVEL	DELICACY/SPECIAL OCCASION MEAT	TENDERNESS	(please circle one score for each line) Least Preferred / Most Preferred
					SCORE
1	$7.50/steak	LOW	YES	SLIGHTLY TENDER	1 2 3 4 5 6 7 8 9 10 11 12
2	$2.50/steak	HIGH	YES	TENDER	1 2 3 4 5 6 7 8 9 10 11 12
3	$2.50/steak	LOW	NO	VERY TENDER	1 2 3 4 5 6 7 8 9 10 11 12
4	$5.00/steak	LOW	YES	TENDER	1 2 3 4 5 6 7 8 9 10 11 12
5	$7.50/steak	HIGH	YES	VERY TENDER	1 2 3 4 5 6 7 8 9 10 11 12
6	$2.50/steak	LOW	YES	SLIGHTLY TENDER	1 2 3 4 5 6 7 8 9 10 11 12
7	$7.50/steak	LOW	NO	TENDER	1 2 3 4 5 6 7 8 9 10 11 12
8	$5.00/steak	HIGH	NO	SLIGHTLY TENDER	1 2 3 4 5 6 7 8 9 10 11 12
9	$5.00/steak	LOW	YES	VERY TENDER	1 2 3 4 5 6 7 8 9 10 11 12
10	$5.00/steak	HIGH	YES	TENDER	1 2 3 4 5 6 7 8 9 10 11 12

11	$7.50/steak	LOW	NO	VERY TENDER	1	2	3	4	5	6	7	8	9	10	11	12

EXPERIMENTAL DESIGN 3

Listed below are 11 "profiles" describing a **bison** meat product. Imagine you are purchasing an 8 oz. round **bison** steak with the characteristics identified in each profile and rate your preference for the **bison** meat in each case. For reference purposes an equivalent 8 oz. round beef steak would cost $2.50 per round steak. (Round steak is often used in stews, marinated for use on kabobs, or oven roasted sometimes in a sauce)
Please rate each of the eleven profiles on a scale of 1 to 12, where 1 = LEAST PREFERRED and 12 = MOST PREFERRED.

You are encouraged to use the full scale from 1-12 when rating the different cases.

Profile	PRICE OF MEAT	CHOLESTEROL LEVEL	LOCALLY PRODUCED IN ALBERTA	JUICINESS	(please circle one score for each line) Least Preferred										Most Preferred	
										SCORE						
1	$3.00/steak	LOW	NO	VERY JUICY	1	2	3	4	5	6	7	8	9	10	11	12
2	$3.00/steak	LOW	YES	JUICY	1	2	3	4	5	6	7	8	9	10	11	12
3	$2.50/steak	LOW	YES	JUICY	1	2	3	4	5	6	7	8	9	10	11	12
4	$3.00/steak	HIGH	YES	SLIGHTLY JUICY	1	2	3	4	5	6	7	8	9	10	11	12
5	$2.50/steak	LOW	NO	SLIGHTLY JUICY	1	2	3	4	5	6	7	8	9	10	11	12
6	$2.50/steak	HIGH	YES	VERY JUICY	1	2	3	4	5	6	7	8	9	10	11	12
7	$2.00/steak	HIGH	NO	JUICY	1	2	3	4	5	6	7	8	9	10	11	12
8	$2.00/steak	LOW	YES	SLIGHTLY JUICY	1	2	3	4	5	6	7	8	9	10	11	12
9	$2.00/steak	LOW	YES	VERY JUICY	1	2	3	4	5	6	7	8	9	10	11	12

10	$2.00/steak	LOW	NO	SLIGHTLY JUICY	1 2 3 4 5 6 7 8 9 10 11 12
11	$2.00/steak	HIGH	NO	SLIGHTLY JUICY	1 2 3 4 5 6 7 8 9 10 11 12

APPENDIX B: PRINCIPAL SURVEY

Department of Agricultural Economics
University of Saskatchewan
Consumer Survey

1. When purchasing red meat for home consumption, how important is **each** of the following. Circle the number between 1 and 9 Where **1** indicates **Not Important** and **9** indicates **Very Important**. **(Please circle one score for each line)**

	Not Important					Very Important			
Vitamin/mineral content	1	2	3	4	5	6	7	8	9
Available where you regularly buy groceries	1	2	3	4	5	6	7	8	9
Quick/Convenient to prepare	1	2	3	4	5	6	7	8	9
Fat content	1	2	3	4	5	6	7	8	9
Cholesterol content	1	2	3	4	5	6	7	8	9
Protein content	1	2	3	4	5	6	7	8	9
Price	1	2	3	4	5	6	7	8	9
Versatility (variety of dishes can be made from meat or meat can be cooked in a variety of ways)	1	2	3	4	5	6	7	8	9
Novelty (unique/unusual eating experience)	1	2	3	4	5	6	7	8	9
Uniquely North America animal (heritage food)	1	2	3	4	5	6	7	8	9
Natural/Organic	1	2	3	4	5	6	7	8	9
Locally produced (Alberta)	1	2	3	4	5	6	7	8	9
Taste/Flavour	1	2	3	4	5	6	7	8	9
Tenderness	1	2	3	4	5	6	7	8	9
Juiciness	1	2	3	4	5	6	7	8	9
Other (Please Specify) _____	1	2	3	4	5	6	7	8	9

THE REMAINDER OF THIS SURVEY WILL FOCUS SPECIFICALLY ON **BISON MEAT**.

In the next question, you are going to be provided with a number of descriptions or "profiles" of bison meat.

Remember that it is not necessary for you to have tasted bison meat before to answer these questions.

Bison meat will be described using five characteristics:

- **Fat content** compared to beef (equal to beef, 25% less than beef, or 50% less than beef)
- **Tenderness** (slightly tender, tender or very tender)
- **Price** for an 8-oz. bison striploin steak ($5, $7.50, or $10.00)
- **Time need to prepare/cook the meat** (less than 15 minutes, 15-30 minutes, or more than 30 minutes)

The descriptions or "profiles" presented in the next question will be different combinations of these four features of bison meat. We would like to find out your attitude toward each of the profiles.

Please now proceed to question 2 and read the instructions at the top of the next page.

2. Bison are a uniquely North American species that are part of the Canadian heritage. Listed on this page and the next are 11 hypothetical "profiles" describing bison meat. Imagine you are purchasing an 8 oz. striploin bison steak with the characteristics identified in each profile and rate your preference for the bison steak in each case. For reference purposes, an equivalent 8-oz. beef striploin steak would cost $5.00 per steak.

Please rate each profile on a scale of 1 to 12, where 1 = LEAST PREFERRED and 12 = MOST

PREFERRED. You are encouraged to use the entire 1 – 12 scale when rating the profiles.

Profile 1	Profile 5
Fat Content: 50% less than beef **Tenderness:** tender **Price/8oz. Steak:** $5.00 **Time to both prepare and cook meat:** more than 30 minutes **Least Preferred** **Most Preferred** 1 2 3 4 5 6 7 8 9 10 11 12	**Fat Content:** 25% less than beef **Tenderness:** tender **Price/8oz. Steak:** $10.00 **Time to both prepare and cook meat:** less than 15 minutes **Least Preferred** **Most Preferred** 1 2 3 4 5 6 7 8 9 10 11 12
Profile 2	Profile 6
Fat Content: 50% less than beef **Tenderness:** slightly tender **Price/8 oz. Steak:** $10.00 **Time to both prepare and cook meat:** between 15 and 30 minutes **Least Preferred** **Most Preferred** 1 2 3 4 5 6 7 8 9 10 11 12	**Fat Content:** 25% less than beef **Tenderness:** slightly tender **Price/8 oz. Steak:** $7.50 **Time to both prepare and cook meat:** more than 30 minutes **Least Preferred** **Most Preferred** 1 2 3 4 5 6 7 8 9 10 11 12
Profile 3	Profile 7
Fat Content: 25% less than beef **Tenderness:** very tender **Price/8 oz. Steak:** $5.00 **Time to both prepare and cook meat:** between 15 and 30 minutes **Least Preferred** **Most Preferred** 1 2 3 4 5 6 7 8 9 10 11	**Fat Content:** same as beef **Tenderness:** tender **Price/8 oz. Steak:** $7.50 **Time to both prepare and cook meat:** between 15 and 30 minutes **Least Preferred** **Most Preferred** 1 2 3 4 5 6 7 8 9 10

Profile 4

  Fat Content: 50% less than beef
  Tenderness: very tender
  Price/8 oz. Steak: $7.50
  Time to both prepare and cook meat: less than 15 minutes

Least Preferred   Most Preferred

1   2   3   4   5   6   7   8   9   10   11   12

Profile 8

  Fat Content: same as beef
  Tenderness: slightly tender
  Price/8 oz. Steak: $5.00
  Time to both prepare and cook meat: less than 15 minutes

**Least Preferred
Most Preferred**

1   2   3   4   5   6   7   8   9   10   11   12

Profile 9

  Fat Content: same as beef
  Tenderness: very tender
  Price/8oz. Steak: $10.00
  Time to both prepare and cook meat: more than 30 minutes

Least Preferred   Most Preferred

1   2   3   4   5   6   7   8   9   10   11   12

Profile 11

  Fat Content: same as beef
  Tenderness: very tender
  Price/8 oz. Steak: $7.50
  Time to both prepare and cook meat: less than 15 minutes

**Least Preferred
Most Preferred**

1   2   3   4   5   6   7   8   9   10   11   12

Profile 10

  Fat Content: same as beef
  Tenderness: very tender
  Price/8 oz. Steak: $5.00
  Time to both prepare and cook meat: less than 15 minutes

Least Preferred   Most

Preferred

1 2 3 4 5 6 7 8 9 10 11
12

For analytical purposes, it is especially important that you provide a response to all 11 profiles. Please check now to make sure you have not missed a profile.

3. We ARE GATHERING INFORMATION ON THE IMAGE OF BISON MEAT AND THE BISON INDUSTRY AS A WHOLE. PLEASE PROVIDE YOUR PERSONAL OPINION ON THE FOLLOWING.

a) My image of bison meat is that it is healthy for you

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

b) My image of bison meat is that it is a delicacy or special occasion meat

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

c) My image of bison meat is that it has a wild meat or "gamey" taste

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

d) My image of bison meat is that it is tough

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

e) My image of bison meat is that it is dry

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

f) My image of bison is that it is an endangered species

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

g) My image of bison is that it is resistant to most livestock diseases

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

h) My image of the bison meat industry is that it is growing

   Agree ☐   Disagree ☐   Neither agree nor disagree ☐

i) If you have any other "images" or beliefs about bison, bison meat or the industry, please provide them on the lines below.

_____

_____

_____

_____

4. ARE YOU THE PRIMARY SHOPPER FOR GROCERIES IN YOUR HOUSEHOLD?

☐   ☐   ☐

    Yes   No   Shared Responsibility

5. HOW OFTEN DO YOU EAT RED MEAT?

☐   ☐   ☐   ☐   ☐

Rarely   Once a Month   Once a Week   2-3 Times/week   Daily

6. ON AVERAGE IN A MONTH HOW OFTEN DO YOU EAT A MEAL IN A RESTAURANT?

☐   ☐   ☐   ☐   ☐

Less than Once   Once a Month   2-3 Times/Month   Once a Week   More than Once
a month   a Week

7. HOW MANY TIMES HAVE YOU TRIED BISON MEAT?

☐   ☐   ☐   ☐

Never   Once or Twice   3 to 5 Times   More than 5 times

The following information helps us determine broad trends. All information will be kept strictly confidential and will be used in aggregate not at the individual level.

8. HOW MANY PEOPLE ARE IN YOUR HOUSEHOLD?

☐   ☐   ☐   ☐   ☐

1   2   3   4   More than 4

9. YOUR AGE GROUP

☐   ☐   ☐   ☐   ☐   ☐

Less than 20 Years   20-29 Years   30-39 Years   40-49 Years   50-59 Years   60+ years

10. YOUR GENDER

☐   ☐

    Male   Female

11. HAVE YOU EVER BEEN ADVISED BY A PHYSICIAN TO REDUCE THE FAT OR   CHOLESTEROL CONTENT IN YOUR DIET?

☐
Yes

☐
No

12. HIGHEST LEVEL OF EDUCATION YOU HAVE ATTAINED

☐
Less than Grade 9

☐
Grade 9 to 13

☐
Technical School

☐
College Diploma

☐
University Degree

13. ANNUAL (GROSS) FAMILY INCOME

☐
Under $20,000

☐
$20,000-$39,000

☐
$40,000-$59.000

☐
$60,000-79,000

☐
$80,000–99,000

☐
$99,000-$110,000

☐
$110,000-$129.000

☐
$130,000-149,000

☐
more than $150,000

14. WE VALUE YOUR OPINION, PLEASE FEEL FREE TO MAKE ANY COMMENTS ON BISON MEAT OR THIS SURVEY

_____
_____
_____
_____
_____
_____

Thank you for participating in this survey.

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