



CONSUMER PREFERENCES FOR LEANNESS IN BEEF OVER THE PAST 50 YEARS - SMITHFIELD REVISITED -

Dransfield, E. and Ngapo, T.M.¹

Propriétés Sensorielles et Préférences, Station de Recherches sur la Viande,
INRA, Theix, 63122 St-Genès-Champanelle, France.

¹Current address: Agriculture and Agri-Food Canada, Food Research and Development Centre,
Saint-Hyacinthe, Quebec, J2S 8E3, Canada.

Background

Beef is losing ground to sales of other meats and it is important therefore to try to determine the origins of this declining consumption. The origins can be found in both the intrinsic qualities of the beef on offer and consumer expectations. Concerns about healthier eating and the recommendation to reduce the consumption of saturated fats from animal origin that may be related to cardio-vascular disease could impact on meat consumption or on the choice of leaner meats. Changing life-styles, with smaller households and less time spent in meal preparation may also influence the type of food chosen with an increase in prepared meals and eating out. The knowledge of the importance of these factors could be crucial in predicting future trends in consumer consumption of beef and in providing a basis for future strategic planning in the beef industry.

Different approaches have been used to determine the intrinsic factors governing consumer choice. Surveys have been conducted on choice in relation to external fat cover and marbling in Canada (Jeremiah, 1981 and 1982) and, more recently by questionnaires, on Belgian consumers' perceptions of beef (Verbeke and Viaene, 1999) and the importance of characteristics of beef as quality indicators in the shop (Glitsch, 2000) in six European countries. These studies all show importance of various beef appearance characteristics, of which fat cover and marbling were included, however they do not investigate the actual preferred levels of fatness in beef.

In 1955, Pomeroy (1956) undertook a survey at the (now) Royal Smithfield Show in England to determine consumer preferences for beef in terms of fatness. Fatty beef rib joints (with 40% of the cut surface visible as fat) were preferred by 63% of consumers. In 1982, Dransfield (1983) repeated the survey using similar joints and observed that the preference had fallen to 24% and that most consumers preferred the leanest rib cut with only 30% visible fat. In 2002, the opportunity arose to restage the study on consumer preferences for fatness thus giving evidence of changes in preferences over half a century.

Objectives

- Determine British consumer preferences according to the level of fatness in beef.
- Determine the changes in consumer preferences over half a century by comparing the results with studies performed in 1982 and 1955.
- Relate consumer choice to socio-demographic categories.

Materials and methods

Both previous surveys were undertaken at the (now) Royal Smithfield Show, a renowned Agricultural show held every 2 years in London. As Dransfield believed in 1982, those attending the show might not statistically represent consumers in the whole UK population, however the opportunity to re-stage the surveys conducted in 1955 (Pomeroy, 1956) and 1982 (Dransfield, 1983) greatly outweighs any disadvantages of a restricted sample of consumers.

The procedures and analyses used here followed as closely as possible those used in 1955 (Pomeroy, 1956) and 1982 (Dransfield, 1983) to facilitate comparison of results. However, unlike the earlier studies, the fatter beef rib joints, with a cut surface of 40 and 48% visible fat, could not be obtained locally at supermarkets, butcheries or abattoirs. As an alternative, photographs of beef rib joints were made, following those published previously (Pomeroy, 1956; Dransfield, 1983). Digital images of these beef photographs were



computer modified to achieve the fatness levels (48, 40, 37 and 30% of the cut surface) and the lean to fat ratios (1.05, 1.36, 1.52 and 2.22, respectively for the given fatness levels) similar to those used in the two previous studies.

Four different beef rib cuts were photographed and each image was computer modified to give the four levels of fatness for each rib giving a total of 16 (4x4) photographs. Four A3 posters were made, each showing four images: the four different ribs of beef, each with a different level of fatness. The order of the level of fatness and the rib was randomly placed in the poster and each rib was randomly assigned a three digit number.

The posters of raw beef ribs were randomly presented to consumers at the Royal Smithfield Show in London, England in November 2002. Each poster was seen by approximately equal numbers of consumers on each of the four days of the show. The consumers were asked to rank the beef samples in order giving their first, second, third and fourth preferences. Place of residence, occupation, age, number of children and marital status were also asked of each consumer.

Significant differences in the ranking of the four fat levels were observed using Friedman test (SAS, 1999). Links between the consumers' first choices and socio-demographic information were determined using χ^2 test (SAS, 1996).

Results

1. Consumers

The survey was completed by 1064 consumers, all over 15 years old, of which the majority (987) were from Great Britain. This compares with 565 in 1955 and 1880 consumers in 1982.

Comparisons of the socio-demographic information about the consumers showed that a lower proportion of consumers from North East, London and Home Counties regions of England participated than had in the two previous studies and might be explained, at least in part, by changes in regional boundaries and the recent importance placed on attracting participation from all regions of the UK. Greater proportions of consumers were observed from Scotland and overseas.

The age distribution of participants was similar to that in 1982 but with a greater proportion of participants under 30 years of age than in 1955. A greater proportion of farmers and a lower proportion of butchers completed the survey in 2002 than in 1955 or in 1982. There were also a greater proportion of participants without children and fewer with 3 or more children than in 1982 (number of children was not available for the 1955 survey).

In the current survey, the proportion of single/divorced/widowed was similar to that of married/co-habiting people and there were almost four times as many men as women. These statistics were not available for the 1955 and 1982 surveys.

2. Consumer preferences

The consumer rankings of the four fatness levels are given in Table 1. The 2002 first choice rankings differed significantly (Friedman's test; $P < 0.01$) from each other for all four fatness levels.

The leanest sample (with 30% of the surface as fat) was the most preferred cut, being the first choice for 53% of consumers. This was a slightly lower percentage than that (60%) obtained in 1982. In 1955, this leanest cut was ranked only third in preference.

The second most preferred cut in 2002 (placed first by 31% of consumers) was the second leanest (37% fat), followed by third leanest (40% fat chosen by 13% of consumers). In 1982, the inverse ranking of these two fatness levels was observed.

The biggest shifts in the first choice preferences from 1982 to 2002 were the increase in the percentage of people preferring the 37% fat and the decrease in those preferring the cut with 40% fat. Thus there had been a decrease in preference for fatness at these levels over the past 20 years.



In all three surveys, the fattest (48%) beef cut was the least popular selection, but, even at this low preference, a trend was evident. It was placed as first choice by fewer and fewer people, decreasing from 6 to 4 to 3% of consumers for the 1955, 1982 and 2002 surveys, respectively. The largest change over this half century was a decrease in first choice preference for the rib cuts with 40% fat. The percentage of consumers giving this as their first choice decreased from 63% in 1955 to 24 % in 1982 and to only 13% in 2002 (Table 1).

Table 1. Percentage of consumer ranking their preference for the four fat levels in surveys conducted in 1955, 1982 and 2002

Fat level (% cut surface)	First choice - preferred			2 nd choice	3 rd choice	4 th choice
	1955	1982	2002	2002	2002	2002
30	12	60	53	26	13	8
37	17	12	31	47	19	3
40	63	24	13	23	56	8
48	6	4	3	4	12	81

Second and third preferred choices, and by default the least preferred, were only available from 2002 survey (Table 1). In this, the most preferred second choice (for 47% consumers) was the 37% fatness level. The leanest (30% fat) and the 40% fatness level were selected each by a quarter of the consumers as their second choice. The third choice was most often (56% of consumers) the 40% fatness level and the last choice, or least preferred, for 81% of consumers, was the fattest rib (48% fat).

3. Preferences and socio-demographic data

From 1955 to 1982, and similarly from 1982 to 2002, the decrease in the proportions of consumers selecting either of the two fattiest beef cuts as their preferred was similar for all socio-demographic categories. A slightly higher proportion of consumers aged 50 years or over preferred one of the two fattest ribs in both 1955 and 1982 than the other age categories, although this tendency was not observed in the 2002 survey. Indeed there was a lower proportion of those 50 years and over for the fattest (48%) rib than for the other fatness levels. Of those choosing the fattest beef (48% fat), none of them were in the youngest (15-20 year old) age category.

There were few effects of gender on choice, except for the fattest beef which was placed as first choice by 30 people (3% of the whole consumer sample) of whom 28 were men.

Discussion

While fat is the only factor studied here, it is acknowledged that it is not the only factor considered in choosing beef by the consumer or in the purchase decision. However, fat content is, and clearly has been for the last 50 years, an important factor not only for consumer preference but also in purchase.

Considering only the surveys in 1982 and 2002, the proportion of consumers choosing the leanest rib had changed little, but fewer people chose the intermediate level of fatness in 2002. Considering all three surveys, the number of people choosing the two leanest cuts of beef has increased from 29% in 1955 to 72% in 1982 and 84% in 2002. The fattest rib cut (48% visible fat) was the least preferred in all 3 surveys. Although not unusual in 1955, it is unlikely that this high level of fatness in beef would be readily available nowadays.

Choice is likely to include other factors which may involve the consumer in a relatively extended problem solving and intensive evaluation of beef attributes in making the purchase (Verbeke, 2000). When purchasing meat in the UK in 1958 (see review by Jeremiah, 1982), 60% of consumers considered colour of lean, 36% leanness, 28% marbling, 25% quality of fat, 10% bone and 4% firmness. So, at that time, colour appeared to be more important although fatness played an important role. The reasons for this are unclear but



may be due to the variations on offer in the shop and the importance at that time placed on colour as an indicator of freshness and quality. The greater importance of fatness nowadays is supported by consumer studies conducted in different European countries (Glitsch, 2000) in which consumers were asked to rank “quality in the shop”. Irish and UK consumers ranked leanness as one of the most helpful characteristics and marbling was one of the second choices. German and Spanish consumers ranked leanness as one of the second most helpful characteristics.

This study concerned only beef but other studies suggest similar tendencies in preference for leaner lamb and pork. However these other studies are punctual, whereas this survey on beef is the first time qualitative studies have been compared over such a long period. As far as we are aware no longitudinal studies have been performed on preferences for different types of meats.

Finally, it is interesting to note that the increasing preference for leaner meat since 1950s is in contrast to the trend of an increase in the proportion of over-weight people in the UK.

Conclusions

- Fatness in beef has been an important characteristic in the consumers’ choice for the last half century, but the majority of today’s British consumers preferring leaner meat to their predecessors.
- Since the first meat congress (now called The First European Meeting of Meat Research Workers) in 1955, the percentage of British choosing cuts of beef with less than 40% visible fat has increased from 29% to 84% today.
- The percentage of people choosing the leanest cut offered (30% of the surface area) has stabilised but fatter beef was chosen by fewer people than in previous surveys. The preference of UK consumers for lean cuts of beef is likely to continue in the future.
- Modern production methods should take into account this continued trend in consumer preference for lean beef.

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