

Impact of specifications on improving the quality of retail meat

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Introduction

Consumer surveys in the USA have shown that more than 20% of consumers are dissatisfied with the eating quality of beef bought at supermarkets (Miller, 1992). At supermarkets, tenderness has been identified as the most critical eating quality characteristic which determines whether consumers are repeat buyers. Furthermore, only 0.1% of unhappy supermarket consumers complain about the poor quality attributes of retail meat (Wilkes, 1992). It is generally accepted by the meat industry that there is a problem in the consistency of meat quality characteristics in domestic markets.

In response to this, Australia has introduced a 5 star, 4 star, 3 star and 1 star eating quality grading system for beef based on tenderness, juiciness, flavour and consumer eating scores (Webster, 1997). In New Zealand, a Quality Mark system has been introduced which requires beef carcasses should be pH 5.8 or under and shear force values should have a mean of 8 kgF with 95% of samples less than 11 kgF (Frazer, 1997).

Irrespective of these national standards for eating quality, there has been a trend for supermarket chains and major buyer groups to set their own purchasing specifications. This paper reports on the impact of a large supermarket group in New Zealand setting tenderness specifications to suppliers on the distribution and changes in tenderness in domestic beef at retail outlets.

Objective: To determine whether the setting of specifications can lead to an improvement in meat quality for consumers.

Methods

Sampling and tenderness determination was described fully in an earlier paper (Bickerstaffe *et al.*, 1997). Briefly, slices (25 mm wide) of longissimus dorsi were removed between the 12 to 13 vertebra of carcasses (often known as midloin steak, striploin, midstriploin or porterhouse) three days post-mortem, randomly at 45 supermarkets. The steaks were cooked to an internal temperature of 75°C and the tenderness of at least ten 10x10 cm strips (known as bites) determined using a MIRINZ tenderometer (Chrystall and Devine, 1991). Tenderness, expressed as kgF, was the maximum shear force to cut across the fibres. Anything with a shear force of >11 kgF is considered unacceptable and tough as judged by consumers.

Results and Discussion

In this work, the shear force values of the steaks were allocated to the following tenderness ranges: Tender (3.5-7.9 kgF), acceptable (8.0-10.9 kgF) and unacceptable (>11 kgF). In the initial survey (Table 1) 29% of the beef was unacceptable but within 14 months the amount of unacceptable beef supplied to the domestic supermarkets has been reduced by 72% with a 43% increase in midloin steaks classified as tender.

Table 1: Variation in the tenderness of steaks from supermarkets

		Tender Up to 7.9 kgF	Acceptable 8.00 to 10.9 kgF	Tough over 11 kgF
Round 1 (Jan '97)	(n = 73)	53%	18%	29%
Round 2 (May '97)	(n = 70)	71%	10%	19%
Round 3 (Aug '97)	(n = 97)	71%	16%	13%
Round 4 (Dec '97)	(n = 124)	76%	11%	13%
Round 5 (Mar '98)	(n = 100)	76%	16%	8%



The beef in the original survey originated from 12 processors. Table 2 shows the range of tenderness variations of meat supplied from the processors. Seven of these processors produced unacceptable beef. One supplier, in particular, has quality problems and needs to address its processes.

Table 2. Variation in beef tenderness across various suppliers.

Supplier	% Tender up to 7.9kgF	% Acceptable 8.0 to 10.9kgF	% Tough over 11kgF
1	100	0	0
2	100	0	0
3	80	20	0
4	60	40	0
5	86	14	0
6	90	0	10
7	60	30	10
8	70	15	15
9	70	10	20
10	79	0	21
11	67	11	22
12	0	40	60

Thus, with the introduction and awareness of tighter buyer specifications, processors of unacceptable beef will have to change their stock procurement procedures, pre-handling methods or processing procedures to reach the necessary buyer specifications. Otherwise they will suffer a loss in market share and profitability. Some processors have changed their method of electrical stimulation and refrigeration profiles in response to the introduction of supermarket specifications. Implications for the meat industry are that all aspects of the supply chain must be improved in response to the changing demands of consumers or, ultimately, suffer the consequences of premium consumer markets being lost irretrievably.

Conclusions

1. A significant proportion of meat reaching domestic consumers has been unacceptable.
2. Setting specifications and implementing a testing programme can identify problem areas and lead to improvements

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