

IN-HOUSE CONSUMER PANEL ACCEPTABILITY OF FIVE PRODUCTS FROM BONELESS LAMB FLAPS

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Background

Sheepmeat has the fewest added-value and convenient products of all the common domestic meat animals. A recent survey in Britain indicate that over 50% of lamb is sold in the form of traditional roast, 70% of which is eaten by consumers aged 45 or older (Heaney, 2001). Similarly, in United States, the result of a survey of consumers ranked lamb last out of 7 meats in convenience/ ease of cooking and concluded that lamb has a consumer image problem (Ward et al., 1995). One of the most underutilised cuts in lamb is the flap. It is currently mixed with trimmings, ground and sold as lamb mince. There is need to improve the utilization of lamb cuts such as the flap in order to improve overall revenue from lamb processing. Creating convenience products for different markets including niche markets may be one way of adding value to the flap. In the British survey (Heaney, 2001); creating convenience/ease of preparation was identified as the best way to add value to meat. However, it is important to make sure the products are acceptable to the consumer as many people already avoid eating sheepmeat because of its characteristic odour, flavour and the waxy mouthfeel caused by the high melting point of sheepmeat fat (Young et al., 1994).

Objective

This study was designed to determine the acceptability of meat products from boneless lamb flap with the ultimate aim of increasing the utilization of the cut and as a way of adding value to the whole lamb carcass.

Methods

Thirty five lambs were slaughtered and the flaps (70) removed following established procedures 24 h post-mortem. The flaps were used to make the following products: lamb bacon (cured, cooked and smoked), free-flow cooked toppings (ground lamb bacon made to free-flow), pre-cooked meatballs and patties (same formulation was used for both patties and meatballs) and stuffed (with kumara) oven roast. The flap was also cooked in bag without seasonings in an 80°C waterbath to an internal temperature of 75°C and used for assessing the acceptability of the cut. Meatballs and patties were kept frozen for two weeks and re-heated in a microwave before sensory analysis. An in-house consumer panel (19 males and 19 females) were recruited as described in Farouk and Swan (1999). Panellists assessed samples for the following attributes on a 9-point scale: appearance, aroma, flavour, tenderness, texture, juiciness and overall acceptability. Consumer panellists' demographic details and their intent to purchase information were collected. The products were assessed by the same panellists on different days with no more than two products assessed in a day. Where two products are assessed in a day, one of the products is assessed in the morning and the other in the afternoon during morning and afternoon tea breaks. The toppings were served on unseasoned nacho shells.

Results and discussion

The fat and the collagen content of the boneless flaps were high and the moisture content was low as expected for this cut (Table 1). The high fat content is the reason for the limited utilisation of this cut in processed products. This high fat content with a high melting point could be the reason for the low acceptance of this cut by the in-house consumer panel used in the present study (Table 1). The panel disliked the unseasoned cooked boneless flaps slightly overall. Most of the panellist commented that the meat was too fatty and some commented that the meat had lots of surface connective tissue. Young et al. (1994) attributed the low acceptance of sheepmeat to its characteristic odour, flavour and the waxy mouthfeel caused by the high melting point of the fat. The five products in the present study were selected because they offered opportunities to take advantage of the high fat and collagen content characteristics of this cut.

Results of the in-house consumer acceptability of the five products from the boneless flaps are shown in Table 2. The result indicated that using boneless flaps to make bacon-like products or precooked meatballs and patties or stuffed oven roast improved the acceptability of the flaps by 26-56 % compared to unseasoned boiled-in-bags flaps (Table 1 & 2). The use of flaps in making toppings did not improve the acceptability of boneless flaps. The appearance of the products except the roast (which was not assessed) was disliked slightly to moderately by the panellists (Table 2). Panellists commented on the fatty appearance of the products particularly of the meatballs. The meatballs appeared fattier due to their greyish brown uncured cooked colour. The importance of appearance in the acceptability of the products is underscored by the greater acceptability of patties compared to meatballs or the acceptance of lamb bacon compared to toppings. The formulation used in making the patties was exactly the same as the one used for the meatballs, likewise, the same lamb bacon was ground to produce the toppings. By grinding the bacon, the fat in the toppings appeared whiter and became more obvious compared to the sliced bacon. Consumers also had the opportunity to view the products in the case of the lamb bacon and toppings before reheating so as to enable us assess the acceptance of the products at the point of sale. After reheating or frying the products had better appearance but we suspect the experience of viewing the products in chilled form lingered in the minds of the panellist and consequently affected their scores. If our assumption is correct, then it is likely that the lamb bacon and toppings will do better in food service outlets where the consumer sees the products only when they are ready to be consumed.

Panellists were asked whether or not they would purchase the products and what style of the product they would prefer. The stuffed flap would be purchased by 85 % of the panellists and 88% percent of the panellists would buy the patties and only 47.5% would buy the meatballs. The lamb bacon and toppings would be bought by 45 and 14 % of the panellists respectively. The preference for patties and roast supports the current trend which indicates a rise in the purchase of burgers in UK markets (Fowler, 1999) and the increased opportunities in the food service sector for precooked, pre-seasoned, pre-sliced and portion controlled products (Salvage, 2000). The dismal performance of the other products particularly the meatballs and toppings should not obscure the growing interest in this category of products because results of recent surveys (Fowler, 1999) indicated meatballs are popular with children; and a recent study (Farouk and Swan, 1999) found that consumers appreciated the added convenience of a ready-to-use cooked free-flow beef mince, and most indicated that they may be willing to buy such a product.

Conclusions

Within the limits of the present study, it was demonstrated that boneless lamb flap can be used to produce acceptable lamb bacon, patties, meatballs and stuffed roast but not free-flow toppings. The acceptability of products from boneless lamb flap is strongly affected by their

appearance. A way to mask the fatty appearance of these products may improve their acceptability and thus research should be conducted to address the issue.

References

- Farouk, M.M. & Swan, J.E. (1999) *J. Food Sci.*, 64, 465-468; Fowler, T. (1999) *Meat Demand Trends* No. 99/4, 3-12.
 Heaney, M. (2001) *Meat Demand Trends* No. 01/1, 3-9; Salvage B. (2000) *Meat Marketing Technol.* 8(Supplement), 42-43.
 Ward, C.E., Trent, A. & Hildebrand J.L. (1995) *Sheep & Goat Res. J.* 11(2), 64-70.
 Young, O.A., Reid, D.H., Smith, M.E. & Braggins, T.J. (1994) In: *Flavour of Meat and Meat Products* (F. Shahidi Ed.) UK, Blackie Academic and Professional. Pp. 71-97.

Table 1. Physical, chemical and sensory properties of boneless flaps used in making 5 lamb products

Physical and chemical properties	Weight, Kg	Length, cm	pH	Moisture, (%)	Fat, (%)	Collagen, (%)
	0.69	41.6	6.0	58.1	24.4	2.0
Sensory attributes	Aroma	Flavour	Tenderness	Texture	Juiciness	Overall
	5.1	4.7	4.6	4.5	5.4	4.3

Values are averages of 70 (n = 35 lambs) for the physical and chemical properties, and 38 assessments for the sensory attributes; Standard error of the mean (SEM) are similar (range from 0.1 to 0.2) for the mean scores of all the sensory attributes; Sensory scale: 1 = Dislike intensely; 9 = Like extremely

Table 2. Consumer acceptability of products from boneless lamb flaps

Products	Attributes score						
	Appearance	Aroma	Flavour	Tenderness	Texture	Juiciness	Overall acceptability
Lamb bacon	4.4	5.5	5.9	5.5	5.6	5.5	5.4
Toppings	4.1	4.6	4.8	4.9	4.3	4.5	4.0
Pre-cooked meatballs	2.6	5.6	5.8	7.1	6.2	7.0	6.0
Pre-cooked patties	4.0	6.4	6.8	7.3	6.9	7.3	6.7
Stuffed oven roast	-	6.6	-	6.3	6.1	6.3	6.1

Values are averages of 38 assessments
 Standard error of the mean (SEM) are similar (range from 0.1 to 0.2) for the mean scores of all the sensory attributes;
 Sensory scale: 1 = Dislike intensely; 9 = Like extremely
 - Attributes not assessed.