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BRIEF COMMUNICATION: Does the age and sex affect meat quality in older lambs

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Abstract

During a programme which targeted late-born heavy-weight lambs supplied at 14 months of age, the question was raised about the meat quality of old-season lambs compared to traditional new-season product. In Experiment 1, short loins from 10 new season ram lambs (3.5 months of age) and 10 old-season ram lambs (14 months of age) of similar weights and grades were compared. Samples from new-season lambs scored slightly better for most characteristics (taste $P < 0.10$, tenderness $P < 0.001$ and juiciness $P < 0.03$) but there was no difference in odour ($P < 0.60$) and few tasters disliked any of the samples. In Experiment 2, short loins from 10 ewe, nine cryptorchid and nine ram older lambs with similar carcass weights were compared. There were no significant differences in eating quality between the samples from ram, ewe and cryptorchid lambs. In conclusion, differences due to age were small when carcasses were compared at the same weight and carcass fatness.

Keywords: sex, age, meat quality, lambs, taste panel

Introduction

In New Zealand, lambs are classified as lambs until their first adult teeth are in wear. As part of a commercial programme, late-born heavy-weight lambs were targeted for slaughter at 14 - 15 months of age. Whilst technically still lambs (no permanent incisors in wear) concerns were raised from those associated with the programme about the meat quality of these older lambs especially the ram lambs. It is common to buy store lambs in late autumn in Hawkes Bay and grow them on to heavy weights and slaughter at older ages. This study was undertaken because the results from other studies have been variable and often comparisons have been made at quite different carcass weights and degrees of carcass fatness.

Two groups of lambs were used, one to determine whether the consumer could detect differences between younger and older ram lambs, and the second to determine whether the sex of the lamb had an effect on meat quality in these lambs.

Methods and materials

In Experiment 1, two short loins (*Longissimus dorsi*) were collected from 10 new-season (3.5 month-old) ram lambs and 10 old-season (14 month-old) ram lambs which were killed on the same day. New-season lambs were from the Poukawa ewe flock and were weaned directly off their dams, having grown on average at 393 g/day from birth to slaughter. The 14 month-old lambs had also been farmed at Poukawa, Hawkes Bay, NZ having grown at an average of 110 g/day. All ewes and lambs were Romney-cross and grazed on established ryegrass/white clover pasture. The new-season lambs are typical of fast-growing lambs that are ready to be killed directly off their mothers and the old-season lambs are typical of later-born and smaller lambs that have slow growth rates over the dry summer period. Lambs were selected so that the samples for taste-panel

analysis came from similar carcass weights (20.2 and 20.3 kg carcass for new and old lambs respectively) and YX grade. In total, 40 short loins were scored over 16 sessions with samples being tasted by a total of 151 people. Amongst the tasters, there was a wide range in how frequently they ate lamb, from seldom through to several times per week. On the whole, tasters tended to be traditional NZ European consumers who typically ate their lamb roasted, grilled or barbecued.

In Experiment 2, fifty-two crossbred Romney-cross lambs (14 months of age) were identified prior to slaughter and processed as per the standard procedures at the Oringi plant. These lambs had been grazed on established ryegrass/white clover pastures. From these 52 lambs, 28 (10 ewe, nine cryptorchid and nine rams) were selected with similar weights (mean 18.3 kg) and grades (YX). One hundred tasters were used and every taster sampled at least one piece of short loin from a ewe, a cryptorchid and a ram lamb each session.

Samples were vacuumed packed, aged for eight days at 1°C and frozen. Short loins were thawed at 1°C overnight and then cooked for three minutes using a Breville Smart Grill. The loins were cut into even-sized cubes and provided to samplers. Each taster was offered four samples each session with at least one sample from each treatment group. Generally, samples from the same treatment were from different animals but within each sampling session some tasters received samples from the same animal. Within each session, each taster had a different order of samples. Tasters were asked to score each sample individually and were not told how many samples they had from each treatment group. Different sessions contained different people. Tasters were asked to score each sample individually for taste, tenderness, odour, juiciness and overall from 1 to 5 (1 = really like to 5 = really dislike). Tasters were also asked whether they would buy the product.

Statistical analysis was done using Minitab for Windows with sampling session fitted as a block effect and gender of the sampler as a fixed effect in the generalized linear analysis.

Results and discussion

With a mean score between 2 and 3 for all characteristics in both experiments, it was apparent that few tasters disliked any of the samples from the different treatments (Table 1, 2).

There was a preference for young lambs for all characteristics ($P < 0.10$) except odour where there was no difference (Table 1). Panelists were unable to consistently identify which samples were from the new or old-season lambs.

There were no significant differences in eating quality between the samples from ram, ewe and cryptorchid lambs (Table 2). There was no suggestion of any ram-taint problem although the comments did suggest that ram samples had a slightly stronger flavor. However, this stronger ram flavour was not disliked by those panelists who observed it. Generally, the scores for taste and tenderness were the driving force behind whether the taster liked or disliked the sample overall and whether they would purchase the sample.

In conclusion, differences due to age or sex of the lamb as determined using a New Zealand taste panel were small when carcasses were compared at the same weight and grade. This is in agreement with Kerslake et al. (2012) who found few differences in shearforce tenderness between entire and cryptorchids in lambs aged 5- or 13-months of age even though they had different carcass weights. They did, however, find that older lambs were both leaner and more tender than the younger lambs. Craigie et al (2012) found small but minor differences between ewe and ram lambs in younger lambs. Schreurs (2013) found no

difference between five-month-old castrate and ram lambs even though the castrates were lighter and had increased carcass fatness. Mashele et al. (2017) compared 5-, 8- and 14-month-old lambs and found that the eight-month-old lambs had the highest shear force values, possibly because 14-month-old lambs were more tender as they had higher levels of intramuscular fat

It would appear that there is no reason why consumers would reject product from the 14-month-old lambs, provided these lambs have an adequate level of finish. Further research is required to understand whether the same holds true for overseas markets especially Asia.

References

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Table 1 Eating quality values of short loins from new- (3.5-month-old) and old- (14-month-old) season ram lambs as evaluated by a NZ-based consumer taste panel

	New-season	Old-season	SEM	t value
Taste	2.15	2.30	0.112	0.10
Tenderness	2.22	2.66	0.115	0.001
Juiciness	2.36	2.60	0.116	0.03
Odour	2.36	2.32	0.121	0.60
Overall	2.17	2.50	0.110	0.002

Table 2. Effect of lamb gender in 14-month-old lambs on eating attributes as determined by a NZ-based consumer taste panel

Lamb gender	Taste	Tenderness	Juiciness	Odour	Overall
Ram	2.47	2.44	2.43	2.54	2.54
Ewe	2.61	2.47	2.49	2.45	2.57
Cryptorchid	2.72	2.49	2.52	2.47	2.65
SEM	0.125	0.145	0.139	0.115	0.123
P	0.31	0.24	0.63	0.38	0.43