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Lamb or young sheep meat – a different sensory profile? Extending the fresh meat season (#128)

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Introduction

Sensory attributes (tenderness, flavour, juiciness) of lamb meat are more acceptable to consumers than for sheep meat. Age and intramuscular fat are important factors affecting meat quality (1,2), so the question is how to meet the supply for fresh sheep meat: if the age of sheep is increased at slaughter, will this affect sensory acceptance in a significant way? At slaughter, Norwegian sheep carcasses are classified into lamb (<1-year-old), young-sheep (1-2.5 years old) and sheep (> 2.5 years old). Lamb meat attains the highest price while the rest of the categories (young sheep and older sheep) are sold at a very low price (3). Providing scientific evidence that selected cuts from young sheep are similar to lamb in terms of sensory traits (1) may encourage the use of meat from young sheep to meet out-of-season demand for fresh meat, thus creating an increased value of meat from young sheep.

In this experiment, we tested the effect of age on meat sensory traits. We compared the sensory profile of meat from lambs (6 months old) and young sheep (18 months old) from two main Norwegian breeds.

Methods

The study was based on animals grazed on neighbouring mountain areas (summer grazing) for 2-3 months; they were then grazed for four weeks on the same cultivated pasture, and slaughtered in October 2018. One Cross-bred White (NKS) ram and 3 Norwegian Spel (NS) rams sired the 50 animals used in the study. Four groups were defined: 16 NKS young sheep, 9 NKS lambs, 16 NS young sheep, and 9 NS lambs. Loin samples (n=50) (*M. Longissimus*) from four groups were tasted by each assessor (n=11) by qualitative descriptive analysis (QDA) for 23 sensory attributes on an unstructured line scale (1-9). Each attribute was analysed separately for the average score over the assessors using a linear mixed model including age and breed and their interaction as fixed effects, and animal as a random effect in addition to residual error. The live weight (kg), slaughter weight (kg), EUROP carcass conformation and fatness were recorded for all animals/carcasses (Table 1).

Results

Animal age was found to affect ($P < 0.05$) odour (fried roasted, sheep, the odour intensity), flavour (fried roasted, gamy, sheep, rancid, liver) and texture (hardness, tenderness, fatness, coarse fibre structural unit) attributes. Odour (fried roasted, gamy) and flavour (fried roasted, gamy and sheep) var-

ied less within the NS than the NKS breed. For sheep odour, there was no age and breed interaction. Breed had an effect ($P < 0.05$) on sheep odour, hardness and coarse fibre structural unit. However, an age*breed interaction ($P < 0.05$) was found for fried roasted and gamy odour (Table 2). This study highlights the effect of sheep age (6 months vs 18 months) on meat sensory attributes of NKS and NS breeds. The main conclusion is that the changes in sensory attributes between lamb and young sheep for the NS breed are less than between lamb and young sheep for the NKS breed. The carcass weight of lamb and young sheep of the NS breed were more similar than for lamb and young sheep of NKS. The NKS weights varied more than for NS (Table 1). For hardness and tenderness, NS changed little with age, compared to NKS. The results of this study can be used in marketing young NS sheep as being equal to NS lambs. This may help farmers get a better price for young NS sheep, and also fill the demand for out-of-season fresh meat supply. To be able to generalize the conclusions, further research using data from more paternal lines is needed.

Conclusion

Age seems less important for NS than for NKS in terms of certain meat sensory attributes. Thus, NS may be superior for extending the fresh meat season.

References

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Notes

Table 2: Sensory attributes with significant age, breed, or age*breed (*values less than 0.001 are rounded off to 0.001). Lsmeans for breed*age.

	Age	Breed	Interaction (age*breed)	NKS		NS	
				Lamb	Young sheep	Lamb	Young sheep
Odour							
Fried roasted	0.001	0.06	0.01	2.8	4.0	3.8	4.0
Gamy	0.057	0.73	0.01	2.6	3.1	3.0	3.0
Sheep	0.001*	0.009	0.79	3.9	4.2	3.5	4.0
Odour intensity	0.03	0.06	0.13	5.2	5.7	5.7	5.7
Rancid	0.07	0.60	0.33	1.7	1.4	1.6	1.5
Flavour							
Gamy	0.001*	0.60	0.05	2.4	3.2	2.9	3.1
Sheep	0.001*	0.16	0.35	3.8	4.5	3.8	4.2
Fried roasted	0.002	0.11	0.30	2.5	3.1	2.9	3.2
Rancid	0.006	0.88	0.83	1.8	1.6	1.8	1.6
Liver	0.01	0.81	0.55	2.6	3.1	2.7	3.0
Flavour intensity	0.06	0.31	0.31	5.4	5.7	5.6	5.7
Texture							
Hardness	0.001*	0.01	0.28	4.5	5.4	4.3	4.9
Tenderness	0.001*	0.18	0.68	5.2	4.2	5.4	4.6
Fatness	0.037	0.16	0.94	3.4	3.3	3.4	3.2
Juiciness	0.098	0.67	0.58	5.3	5.1	5.5	5.1
Coarse fiber structural unit	0.001*	0.03	0.36	4.3	5.4	4.5	5.1

Table 2

Table 1: Mean (\pm s.d.) live weight, slaughter weight, EUROP conformation and fatness of lamb and young sheep of NKS and NS breeds

Age-group	NKS		NS	
	Lamb	Young-sheep	Lamb	Young-sheep
Live weight, kg	45.2 \pm 6.1	74.3 \pm 8.1	45.6 \pm 3.1	56.6 \pm 6.2
Slaughter weight, kg	17.8 \pm 3.0	30.1 \pm 3.9	17.0 \pm 0.9	20.0 \pm 2.8
EUROP conformation ^a	7.0 \pm 1.7	8.3 \pm 0.9	6.9 \pm 1.0	6.4 \pm 0.6
EUROP fatness ^b	5.4 \pm 1.6	6.8 \pm 1.4	7.1 \pm 0.8	6.7 \pm 1.0

^a Scale 1-15 (15 = best conformation; EUROP conformation)^b Scale 1-15 (15 = fattest)

Table 1:

Notes