

EVALUATION OF GROWTH FOR GERMAN MERINO EWE LAMBS ACCORDING TO TEMPERAMENT

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ABSTRACT

This study concerned with evaluating temperament of German Merino ewe lambs using temperament test (temperament score: assessing behaviour of animals on a five-points scale, while spending 30 seconds on the weighing scale). 20 German Merino ewe lambs were fed-*lot* on *ad libitum* concentrate for 41 days. Animals originated from GAK Kht, Gödöllő (Pest County). The farm has continuously monitored by The Association of Hungarian Sheep Breeders. The examined lambs were within part of Fattening Performance Testing. Temperament scores were identified three times under test, together with weighing. First measurement was at weaning while the second was at the end of fattening period, and finally the third was at 365th day. Body weights were recorded prior to and after the fattening period then at the 8th and 12th months of age. Growth curves were drawn according to weight of animals. Daily weight gains during either fattening period or life time were calculated. Temperament score test was not related to the weight at weaning, therefore measurement of temperament was not affected by the weaning process ($P > 0.10$). Twenty German Merino lambs were classified into three categories (calm, medium and nervous) by mean temperament scores (average of 1 and 2 temperament scores). Lambs with good temperament (1 category) had higher live weight at the end of fattening (33.0 kg), compared to the medium category (32.0 kg) and nervous category (29.4 kg). The average daily gain and average weight gain during life time showed a similar tendency among calm category (298.8 g/day, 338.2 g/day), medium category (265.2 g/day, 311.6 g/day) and nervous category (238.7 g/day, 304.5 g/day). Calm ewes had better growth rate, till one year of age, than nervous ewes. This difference was shown on different slopes (b) of growth curves. To sum up, lambs with calm temperament were of better fattening performance compared to lambs with poor temperament. Accordingly, including temperament measurement among selection work may improve the output of fattening.

Key words: *temperament, German Merino, ewe, fattening, growth*

INTRODUCTION

Temperament is defined as the animal's behavioural response to handling by humans (Burrow, 1997). Temperament of livestock species have been measured by subjective assessment of animal behaviour, such as temperament score test, and using objective methods, such as the docility test and the flight speed (or flight time) test (Burrow, 1997). Fordyce *et al.* (1988) had found significantly negative relationship between animals' temperament and live weight in cattle (bullocks and cows). Results of Burrow and Dillon (1997) and Fell *et al.* (1999) presented, that the nervous cattle

group had significantly lower average daily gain, than the calm group. In sheep, Pajor *et al.* (2006) found relationship between temperament and some fattening traits in Hungarian sheep. The lambs with good temperament had higher average daily gains, compared to those with poor temperament in Hungarian Merino breed. Ivanov *et al.* (2005), found that ewes from the calm temperament type exhibited a higher lysozyme and complement concentrations in blood compared to the nervous type, suggesting a better innate immune defence against infections. Neindre *et al.* (1996) revealed that poor temperament is associated with more bruising and dark-cutting in cattle carcasses compared to calm animals. In Hungary, Tózsér *et al.* (2003) were the first applied the temperament score test and flight speed test on cattle and sheep (Tózsér *et al.*, 2004) for animals' temperament determination.

The aim of this study was to investigate the temperament of German Mutton Merino lambs from weaning till a year age and to report the relationship between temperament and live weight and average weight gain of lambs.

MATERIALS AND METHODS

The study was carried out in the GAK Kht Experimental Farm in Gödöllő (Pest County). Data from a total of 20 ewes of German Mutton Merino lambs were used. The growth investigation of lambs studied on two parts. The first was the Fattening Performance Testing. Under fattening test lambs was lot-fed on concentrate mix (137 g/kg crude protein (D.M.) and 8.94 MJ/kg and 6.13 MJ/kg net energy (NE_m and NE_g), DM base for 41 days. The second part was from end of fattening test to one year old. They fed alfalfa hay (*ad libitum*) and concentrate supplement (average daily consumption of concentrate per ewe was 0.4 kg). In each stage the lambs were weighed individually to the nearest 0.1 kg. Body weight measurements were adjusted to average ages 60, 100, 240 and 365 days by using a linear interpolation method. Daily gains were calculated in grams.

Temperament was measured according to the temperament score test developed by Trillat *et al.* (2000). Behaviour of animals was assessed in a 5-score system at weighing, while spending 30 sec on the scale: score-1= calm, no movement, score-2= calm with occasional movements, score-3= calm with some more movements but without shaking the scale, score-4= abrupt episodic movements without shaking the scale, score-5= permanent episodic movements and shaking the scale.

Temperament scores test were repeated three times, together with weighing. First measurement was at weaning, the second was at the end of fattening period, and finally the third was at day 365th. Statistical analysis was processed by SPSS 14.0 program package (ANOVA test, Pearson simple- and Spearman- correlation).

RESULTS AND DISCUSSION

Body weights were taken prior and after the fattening period, then at the 8th and 12th months. Temperament scores were examined three times under investigation period: first measurement was at weaning, the second was at the end of fattening period, and finally the third was at day 365th. Results of body weight and temperament scores of German Mutton Merino lambs at different ages are presented in Table 1.

Table 1: Live weight and temperament scores of German Mutton Merino ewe lambs at different ages.

	Age, day			
	60	100	240	365
Body weight, kg	19.9±4.91	31.2±2.82	50.0±4.78	62.9±4.73
Temperament scores	2.73±1.33	2.67±1.80	-	2.00±1.18

The temperament score and body weight at weaning were 2.73 and 19.9 kg while at the end of fattening were 2.67 and 31.2 kg. The body weight at days 240th and 365th were 50.0 kg and 62.9 kg while temperament score at day 365th was 2.00. Temperament scores, live weight and weight gains under fattening tested are summarized in Table 2.

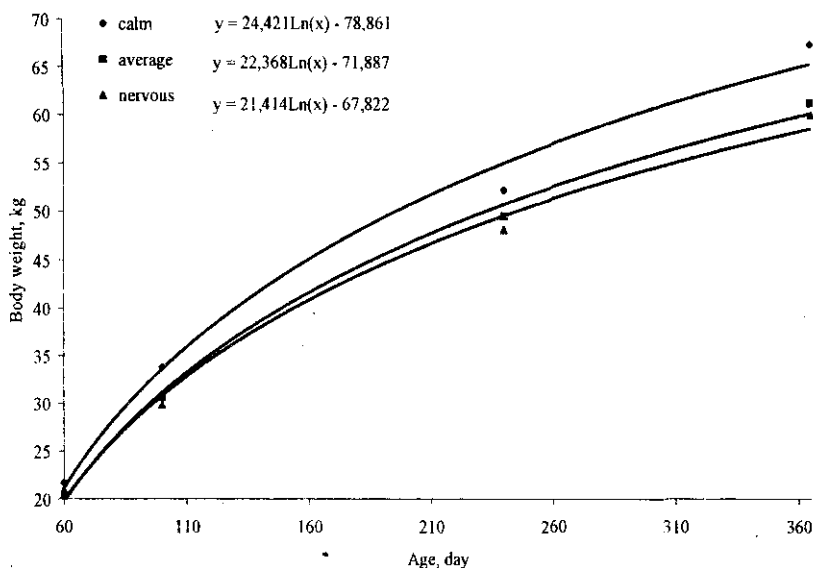
Table 2: Fattening performance of German Merino lambs by temperament categories (mean±sd)

Traits	Weight at the end of fattening	Average weight gain under fattening period	Average weight gain under life time
calm (n=5)	33.0±1.73**	298.82±27.94*	338.19±24.61*
average (n=8)	32.0±2.62	265.24±60.66	311.61±22.55
nervous (n=7)	29.4±1.90**	238.68±50.21*	304.50±21.94*

The evaluation of the effects of temperament on body weight showed that lambs with calm temperament had higher live weight at the end of fattening (33.0 kg), daily weight gain (298.82 g/day) and daily weight gain under life time (338.19 g/day), compared to those having average temperament (32.0 kg, 265.24 g/day, 311.61 g/day), and poor temperament (29.4 kg, 238.68 g/day, 304.50 g/day). Similar results were reported by **Fell et al. (1999)** and **Pajor et al. (2006)** where nervous animals (cattle and sheep) had lower average daily weight gain compared to calm animals. **Fordyce et al.**

(1988) found a significant negative correlation between temperament score and cattle live weight ($P < 0.01$) and revealed that heavier cattle had better temperament scores. The growth curves by mean temperament categories till a one year age was evaluated. The calm ewes had better growth rate till one year of age than nervous ewes. The results are shown in Figure 1.

Figure 1: Growing curves of German Merino lambs according to temperament categories by age



This difference was shown by different slopes (b) of growth curves. These results suggest that calm animals may grow faster than nervous (temperamental) animals (weights at day 365th were; calm: 67.3 kg; nervous: 59.9 kg; $P < 0.05$). It is highly probable that the higher growth rate of calm animals results from an increased feed intake, although the probability that nervous animals use more energy for behaviour avoidance should not be ignored (Burrow and Dillon, 1997).

CONCLUSIONS

Lambs with calm temperament had faster average daily gain, more weight at the end of fattening and better growing rate till one year of age compared to those with poor temperament than nervous ewes. Therefore these results suggest that selection for calm temperament would improve growth performance in the flock.

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