

## **THE EFFECTS OF DIFFERENT INITIAL LIVE WEIGHTS AND SEX ON THE FATTENING PERFORMANCE AND ECONOMIC ANALYSIS OF FAT-TAILED LAMBS IN PASTURE FEEDING IN TURKEY**

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### **Abstract**

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In this study, experiments were done to see the effects of different initial live weights (light and heavy) and sex (male and female) on the fattening performance and economic analysis of fat-tailed lambs (traditional names is Gicik) in pasture feeding. According to result, daily and total live weight gains in light group were 182 g and 12.74 kg, respectively. The values for heavy group were 138 g and 9.66 kg. As for different sex, the male lambs found to get more daily and total live weight gain (134.29 g and 9.40 kg) than the females. Male lambs and lambs with low initial live weight have more advantage than others in terms of net profit. As a result of providing more live weight gain and profit, the light and male lambs can be suggested to the producers who want to breed.

*Key words:* Gicik lambs, pasture feeding, live weight gain, net profit

### **Introduction**

There are many sheep breeds in Turkey. They are generally multipurpose breeds which have low production levels (Unal et al., 2006). One of them is Gicik which are bred in Tokat province. Extensive sheep breeding is made in Tokat just as in Turkey. Tokat province has a significant potential for sheep rising. Large pastures and suitable vegetation for sheep rising are the factors that promote sheep rising. The province has 202665 sheep in 2007, and Karayaka and some sort of hybrid sheep called Gicik constitute most of this population (Anonymous, 2008). Gicik has a

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fat-tail breed, rough and mixed fleece, and probably is a hybrid of various rates between Hemsin and Karayaka or Akkaraman which are raised in Tokat. Gicik sheep is thought either to be brought to Tokat by migrants from Artvin-Batum (Northeast Black Sea region) or to occur by mating between Hemsin sheep, brought by those migrants, and breeds already raised in the area (Akçay, 1997). Besides, Gicik sheep also has been reported to carry Herik blood (Yarkin, 1964). Gicik sheep is tolerant for poor raising and feeding conditions. It has a thin lip structure that can make better use of short- and spare-grassed pastures. Fleece color is almost equally either black or white.

White ones are preferred because their fleece is easily sold while black ones are preferred since they are more tolerant to cold and poor conditions (Akçay, 1997). Rams of Gəcək sheeps are horned. One-third of the females carry horns. Gəcək sheep is a relatively small-sized breed considering live weight and other body measurements (Cimen et al., 2003).

The meat production per capita in Turkey is lower than that in European Union Countries. One of the ways for increasing meat production is to improve reproductive and fattening performance of local sheep breeds (Unal et al., 2006).

Sheep breeding is done both for meat and milk production. In terms of meat, lambs are preferred and have biggest share in income coming from sheep breeding. One of the ways to increase lambs meat production is intensive feeding of lambs whose milk feeding was stopped at the normal or an earlier period (Sahin and Akmaz, 2003).

The main objective of this study is to analyze the effects of pasture feeding on Gıcik lambs who weighted differently at the beginning of the feeding and coming from different sex.

## Material and Methods

Single Gıcik lambs of 3-3.5 month old were used in this study. Research was carried out in two different parts. In the first, 14 male lambs of different initial live weights were employed. These lambs were equally divided into two groups as heavy and light. In the second, seven male and seven female lambs of similar live weights were used.

Lambs were weighed in three consecutive days as hungry before grazing on the pasture in the evenings and average of these three weights were taken as their live weights. Earrings were placed on the lambs whose live weights were determined. In the first four weeks of the trial, lambs grazed on stable only. Starting from the fifth week, lambs used in the study were taken to pasture along with many other lambs in both mornings and evenings. Lambs were given concentrate diet with 15% crude protein and 2.8 ME as 500 g/day/lamb. Pasture + concentrate diet application was

started at the fifth week of the experiment. Live weight increases of the groups were determined by weighing lambs by two-week intervals. Experiment lasted for seventy days.

Live weight gain, feed consumption and profit obtained per lambs were determined in the investigation.

In the economic analysis of pasture feeding as groups (light-heavy and male-female), five different periods (five two-week intervals) were studied separately.

In the economic analysis, total production cost, gross production value and net profit (gross production value-total production cost) were calculated, and the prices of the end of 2007 year were used. Cost of feed was \$ 0.3 per kg and price of lambs live weight was \$ 3.02 per kg. Apart from lambs purchasing price and feed costs, daily variable costs (labor, chemicals, etc.) per day per lamb was \$ 0.19.

## Results and Discussion

### *The Effect of Initial Live Weight on Fattening Performance and Economic Return of Lambs*

It is believed that the younger lamb could gain more daily live weight than the older one. On the other hand, they consume less feed for 1 kg live weight gain.

As can be seen in Table 1, total live weight gain was higher in light live weight group (12.74 kg/lamb) than heavy group (9.66 kg/lamb) ( $P < 0.05$ ). There was no difference between groups for total live weight gain in the first four weeks. However, there was a statistically significant difference ( $P < 0.05$ ) in the sixth week. The reason for this could be the fact that the lambs were fed in the first for weeks only on stable and not supplemented with any concentrate diet. After the fourth week, stable feeding was stopped and lambs were taken to pasture and fed with a supplementary 500 g/day/lamb concentrate diet. After this application, sheep from light group had a higher daily live weight gain in the sixth week.

In 0-10 week period, daily live weight gain was 182 g/lamb for light group and 138 g/lamb for heavy

**Table 1**  
**Live weight gains and net profit of Gicik lambs that have different initial live weight**

Periods, week	Live weights, kg/lamb	Daily live weight gains, g/lamb	Net profit, \$/lamb
Light Group			
0	20.56 ± 0.78	-	-
2	22.50 ± 0.97	138.57 ± 37.0	3.2
4	25.20 ± 0.97	192.86 ± 14.3	5.49
6	28.20 ± 0.87	214.29 ± 19.6*	4.3
8	30.80 ± 1.05	185.71 ± 23.7	3.09
10	33.30 ± 0.86	178.57 ± 19.6*	2.79
Total	12.74 ± 0.47*	182.00 ± 6.7*	18.87
Heavy Group			
0	25.94 ± 0.76	-	-
2	28.20 ± 0.51	161.43 ± 19.2	4.17
4	30.60 ± 0.43	171.43 ± 38.1	4.59
6	32.20 ± 0.81	114.29 ± 30.7	0.07
8	34.10 ± 0.78	135.71 ± 13.3	0.98
10	35.60 ± 0.78	107.14 ± 6.1	-0.23
Total	9.66 ± 0.77	138.00 ± 10.9	9.58

\* P<0.05

group. Light lambs were superior to heavy ones for live weight gain in the tenth week, similar to the sixth week (P<0.05).

Buyukburc et al. (1983) studied Akkaraman 19 kg live weight male lambs whose milk feeding were stopped at tenth week and feed on pasture along with a 500 g/day/lamb concentrate diet, and calculated total live weight gain and daily live weight gain as 11.64 and 166.38 g/lamb, respectively. This value is lower than the light group but higher than the heavy group in our study.

Elicin et al. (1982) studied 2.5 month old male Akkaraman lambs grazed on a vetch-barley mixture and were supplemented with a 500 g/day concentrate diet, and found that daily live weight gain was 169 g/lamb, which is slightly higher than our findings (both light and heavy group).

Cimen et al. (2005) calculated that total and daily live weight gain of Gicik lambs whose live weight was  $34.88 \pm 1.51$  after a 42-day feeding period were

7.455 kg and 177.50 g/lamb.

In many studies, it is reported that live weight gains of 17-20 kg lambs are superior to those of heavier ones (Orskov et al., 1971; Tuncel et al., 1985; Koc, 1996).

According to economical considerations, it is seen that the light group yields a more profitable production (Table 1). Net profit per lamb was \$ 18.87 for light group while \$ 9.58 for heavy group. In both group, the highest net profit was obtained in the fourth week. The reasons for this are lack of feed cost and higher live weight gains in the first four weeks.

In terms of live weight gain and profitability, as in intensive lamb rearing, low live weight (around 20 kg/lamb) can be suggested for pasture feeding in the region.

#### ***The Effect of Sex on Fattening Performance and Economic Return of Lambs***

According to Karabulut and Cangir (1983) male lambs have higher daily live weight gain than the fe-

males. Beside that, they are more efficient to convert the feed to the weight.

As can be seen in Table 2, male lambs had higher values than female ones for total live weight gain in eight and tenth weeks ( $P < 0.05$ ). Male lambs were superior to female ones for daily live weight gain in sixth and tenth weeks ( $P < 0.05$ ). According to the results of feeding trials, total and daily live weight gains per lamb were 9.40 kg and 134.29 g for male lambs, and 7.00 kg and 100.00 g for female lambs. Thus, for total and daily live weight gain, males one have better performance than female ones ( $P < 0.05$ ).

Saricicek et al. (1992) studied 3.5-4.5 month old male and female Karayaka lambs fed with 35% concentrate diet + pasture and 50% concentrate diet + pasture, and found that male lambs were superior to female ones for total and daily live weight gain. These results support our findings.

Cimen and Karaalp (2004a) studied Gicik male lambs with different colours through a ten-week pasture feeding trial. White lambs with  $26.70 \pm 1.25$  kg live weight reached to  $36.10 \pm 1.10$  kg. These values

were  $25.90 \pm 0.76$  and  $35.60 \pm 0.78$  kg for black lambs. Total live weight gains during the feeding were  $9.30 \pm 0.72$  and  $9.66 \pm 0.77$  kg/lamb, and daily live weight gains were  $132.8 \pm 10.25$  and  $138.0 \pm 10.98$  g/lamb for white and black lambs, respectively.

Cimen and Karaalp (2004b) compared the pasture performances of Gicik, Karayaka and Akkaraman lambs. According to the 70-day fattening trial, total live weight gains were  $9.3 \pm 0.71$  kg in Gicik lambs while  $10.2 \pm 0.56$  and  $12.4 \pm 0.29$  kg in Karayaka and Akkaraman lambs, respectively. Daily live weight gains were  $132.8 \pm 10.2$ ,  $145.7 \pm 8.0$  and  $177.1 \pm 4.1$  g/lamb in Gicik, Karayaka and Akkaraman lambs, respectively.

In many intensive feeding studies, performance of male lambs are reported to be better than the female lambs (Rutter, 1970; Latif and Owen, 1980; El-Karim and Owen, 1987; Koc, 1996).

Considering the net profits obtained from the different sex lambs, it is seen that male ones are much better than the female ones (8.79 \$/lamb) (Table 2). The highest net profit were obtained in the fourth week

**Table 2**  
**Live weight gains and net profit of Gicik lambs that have different sex**

Periods, week	Live weights, kg/lamb	Daily live weight gains, g/lamb	Net profit, \$/lamb
Male Lambs			
0	$26.70 \pm 1.25$	-	-
2	$28.60 \pm 1.42$	$135.71 \pm 46.6$	3.08
4	$30.80 \pm 1.20$	$157.14 \pm 33.1$	3.99
6	$32.80 \pm 1.12$	$142.86 \pm 15.9^*$	1.28
8	$34.50 \pm 1.10^*$	$121.43 \pm 14.3$	0.37
10	$36.10 \pm 1.10^*$	$114.29 \pm 11.4$	0.07
Total	$9.40 \pm 0.72^*$	$134.29 \pm 10.2^*$	8.79
Female Lambs			
0	$25.90 \pm 0.60$	-	-
2	$27.40 \pm 0.56$	$107.14 \pm 11.3$	1.87
4	$28.70 \pm 0.52$	$92.86 \pm 8.8$	1.27
6	$29.90 \pm 0.48$	$85.71 \pm 8.8$	-1.14
8	$32.90 \pm 0.29$	$114.29 \pm 13.4$	0.07
10	$32.90 \pm 0.29$	$100.00 \pm 23.7$	-0.53
Total	$7.00 \pm 0.59$	$100.00 \pm 8.5$	1.54

\*  $P < 0.05$

in males (3.99 \$/lamb) but in the second week in females (1.87 \$/lamb). There were losses in sixth and tenth weeks in female lambs.

In terms of both feeding performances (live weight gain) and profitability, male lambs are superior to female lambs in pasture feeding, similar to intensive feeding. Thus, male lambs should be preferred for feeding in the region.

## Conclusion

To sum up, for lamb feeding on pasture in Tokat Province, low live weight (around 20 kg/lamb) male lambs should be preferred.

This is very important for feeding performance of lambs and for the profits. Both low live weight and male lambs are advantageous for live weight gain and profitability.

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