

RESEARCH ON QUANTITATIVE APTITUDES IN THE DIRECTION OF MEAT PRODUCTION IN LAMBS FROM ȚURCANĂ AND ȚIGAIE BREEDS

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Abstract

This paper aims to quantify the quantitative performances to the production of meat of lambs from the main native sheep breeds, in relation to several influencing factors: breed, type of birth and sex of lambs. To evaluate the degree of body development of the lambs during the birth-weaning period (0-60 days), they were weighed at birth, at 30 days and at weaning (60 days). The study was completed by a phenotypic analysis of the aptitudes for meat production on the live animal carried out by the "Method of points" in the lambs after the completion of the experiment. The best results, in terms of quantitative parameters in meat production (average growth rate, total growth rate, weight at slaughter) were obtained by lambs of the Țigaie breed.

Key words: breed, body weight, growth, lambs, type of birth.

INTRODUCTION

Sheep are a species of animals preferred by many breeders due to the multiple particularities materialized through: rusticity, adaptability, the readiness of the species to adapt to a predominantly pastoral exploitation system, the special possibility of efficient utilization of fodder with a high level of cellulose (Călin, 2004).

Also, sheep provide breeders with a wide range of products: milk, meat, hides, skins, hair production, etc.) products that contribute to covering the ever-increasing needs of animal protein, of the population in conditions of economic efficiency.

Meat production, especially the component represented by fattened youth meat, is increasingly requested by consumers, both from our country and especially for export, its quantitative and especially qualitative improvement representing a priority objective for all breeders (Vicovan et al., 2009).

In this sense, one of the priority objectives of this work is represented by the quantification of the main quantitative parameters in meat production (average growth rate, total growth rate, weight at slaughter) in direct correlation with three important influencing factors,

respectively breed, type of birth and sex of lambs.

MATERIALS AND METHODS

The biological material studied in this work was represented by the youth flocks of sheep, current year, belonging to two of the most important sheep breeds in our country, the Țurcană breed and the Țigaie breed, raised in a private farm within the Center Development Region, Covasna County. The farm in Covasna county has sheep from the Țigaie breed, the rusty variety, and sheep from the Țurcană breed, the white variety.

Within the farm, a semi-intensive exploitation system is practiced, characterized by the maintenance of sheep on pasture, during the summer period, with the use, in a first stage, of natural pastures, of cultivated and occasional meadows in the vicinity of the farm, following as a period of three months (June, July and August), the sheep should be kept on the foothill and mountain pastures, rented by the owner. During the winter, the maintenance of the sheep is carried out in the shelter, the feeding being based on canned fodder, hay, roughage, silage fodder and concentrate mixtures.

In order to evaluate the degree of body development of the lambs from the two breeds, during the birth - weaning period (60 days) weightings were carried out at birth, at 30 days and after weaning at the age of 60 days, determining the gain of average daily growth and the total weight gain achieved by it, by stages and during the entire tracked period. All the parameters mentioned above were determined separately for lambs, depending on sex, breed and type of birth.

The phenotypic assessment of the aptitudes for meat production in lambs of each breed was carried out on the live animal by the "Point Method" using the "Scoring Table for the assessment of the state of fattening of sheep". Through this method, each valued region is given a grade on the 1-5 grading scale, grade that is amplified by certain coefficients (whose value is directly proportional to the importance of the analyzed region, viewed through the prism of the main production achieved) written in the sheets of scoring. The value of the marks awarded has the following meanings: 5 = perfect; 4 = very good; 3 = good; 2 = acceptable; 1 = bad.

Taking into account the sum given by the total points awarded, the exterior of an examined sheep can be classified as follows:

- Very good exterior86.1-100.0 points;
- Good exterior.....76.1- 86.0 points;
- Mediocre exterior.....66.1- 76.0 points;

- Poor exterior.....50.1- 66.0 points;
- Bad exterior.....below 50.0 points;

Statistical analysis. Results were presented as mean values \pm standard errors of the mean. Microsoft Office Excel 2016 was used to calculate all statistical parameters (mean, standard deviation, coefficient of variation and standard error of the mean) and the t-test (Student) to determine the significance of the difference between means. Differences were considered statistically significant at $P < 0.05$ and indicated by specific superscripts.

RESULTS AND DISCUSSIONS

The weight of lambs at birth is considered by many specialists (Pădeanu, 2001; Călin, 2004; Pascal, 2007) to be a very important parameter in meat production, because it influences the speed of growth, the state of health, daily weight gain, total weight gain, feed utilization capacity, as well as the subsequent performances achieved by lambs in meat production.

The determination of the body weight, at birth, of the lambs from the two batches of sheep (Table 1), which constituted the experimental material, was carried out taking into account the breed of the animals, the type of birth and the sex of lambs.

Table 1. The evolution of body weight of lambs from single births depending on breed and sex in the period 0-60 days (kg/head)

No.	Age of lambs	Breed	Simple births							
			Males				Females			
			n	$\bar{X} \pm S_{\bar{X}}$	S	CV	n	$\bar{X} \pm S_{\bar{X}}$	S	CV
1.	Birth	Țurcană	15	3.999 \pm 0.137 ^a	0.530	13.27	15	3.508 \pm 0.119	0.463	13.20
		Țigaie	14	4.512 \pm 0.134 ^a	0.501	11.10	14	3.951 \pm 0.119	0.446	11.29
2.	30 days	Țurcană	15	10.042 \pm 0.388	1.502	14.96	15	9.274 \pm 0.356	1.377	14.85
		Țigaie	14	11.178 \pm 0.384 ^a	1.439	12.87	14	10.145 \pm 0.363	1.359	13.40
3.	60 days	Țurcană	15	16.458 \pm 0.467	1.807	10.98	15	15.380 \pm 0.561	2.172	14.13
		Țigaie	14	17.584 \pm 0.558	2.087	11.87	14	16.501 \pm 0.432	1.617	9.80
4.	Total score	Țurcană	15	84.13 \pm 1.22	4.71	5.60	15	82.20 \pm 1.50	5.81	7.07
		Țigaie	14	87.50 \pm 1.71	6.60	7.55	14	86.07 \pm 1.49	5.79	6.72

^{a, b}Within a row, means without a common superscript differ ($P < 0.05$)

In the case of single births in males, the highest calving weight was achieved by the Țigaie breed, the rust variety, of approx. 4.512 \pm 0.134 kg with approx. 12.82% higher than the weight

achieved at birth by the males of the Țurcană breed, between the two batches registering significant differences in this parameter;

The highest weight of females from single births was also achieved within the Țigaie breed, where an average calving weight of approx. 3.951±0.119 kg, higher weight by more than 12.00% compared to the value of the same parameter recorded in the female youth from the Țurcana breed and between these batches being significant differences.

With regard to the weight of the researched material at the age of 30 days, the best results were obtained by the male lambs from the Țigaie breed 11.178±0.384 kg, a weight higher than that achieved by the males from the Țurcana breed from births simple, and in the female superior results were achieved also by the biological material from the Țigaie breed 10.145±0.363 kg with almost 1 kg more than the weight achieved by the females from the Țurcana breed, at the same age.

Among the groups of males, the highest body weight, at the time of weaning, was achieved by the males of the Țigaie breed: 17.584±0.558 kg, which showed a superior capacity to capitalize on additional feed and recorded a higher growth rate with 6.8% compared to males from the Țurcana breed, who recorded a

lower rate of growth, achieving, at the end of the experimental period (16.458±0.467 kg), a lower body weight by approx. 1.12 kg;

The batches of females from single births achieved lower weights than the males, the differences being approx. 7% in the Țurcana breed, respectively 6.5% in the Țigaie breed. Between the two batches of females there were differences of approx. 7.28% in favor of the batch of Țigaie breed males.

The best aptitudes for meat production, highlighted by the score obtained, are achieved by the lambs from the Țigaie breed. The batches of males and females from single births have a "very good exterior" exceeding 86 points, achieving a higher score by approx. 4 %, in the case of males and by approx. 5% in the case of females from the Țurcana breed, which fell into the "good exterior" classification.

The differences between males and females from single births, obtained as a result of the present research on the studied biological material (Table 2), were within the data presented in the specialized literature (Răducuță et al., 2001; Călin, 2004; Pascal, 2007).

Table 2. Significance of differences between males and females, relative to breed of lambs from single births

Specification	Țurcana	Țigaie	Difference (kg)	Calculated t value	Tabular t	Significance of differences
Males	3.999	4.512	0.513	2.67	2.46	*
Females	3.508	3.951	0.443	2.52	2.46	*

NS - non-significant differences (P>0.05); *significant differences (P<0.05); **distinctly significant differences (P<0.01); ***highly significant differences (P<0.001).

Table 3. The variation of the average daily gain of lambs from single births according to breed and sex (kg/head)

No.	Period	Breed	Single births							
			Males				Females			
			n	$\bar{X} \pm S_{\bar{x}}$	S	CV	n	$\bar{X} \pm S_{\bar{x}}$	S	CV
1	0-30 days	Țurcana	15	0.201±0.012	0.047	23.46	15	0.192±0.013	0.051	26.66
		Țigaie	14	0.222±0.014	0.055	24.96	14	0.206±0.012	0.050	24.22
2	31-60 days	Țurcana	15	0.207±0.013	0.053	25.84	15	0.197±0.023	0.091	46.38
		Țigaie	14	0.217±0.017	0.066	30.40	14	0.209±0.019	0.072	34.77

^{a,b}Within a row, means without a common superscript differ (P<0.05).

In the interval of 0-30 days, the lambs from the Țigaie breed from single births achieve the highest gains between 0.222±0.014 kg/head/day for males, respectively 0.206±0.012 kg/head/day for females (Table 3). The daily gain achieved by the Țurcana breed are lower, with approx. 9.4% in males and with approx. 6.8% for females.

During the period of 31-60 days, the lambs from the Țigaie breed, from single births, maintain the same higher rate of growth, achieving the highest gains between 0.217±0.017 kg/head/day for males, respectively 0.209±0.019 kg/head/day in females.

The average daily gain achieved by the lambs from the experimental groups falls within the

data contained in the specialized literature (Taftă, 2008; Voia, 2005; Pădeanu, 2011).

Table 4. The variation of body weight at calving of lambs from twin births depending on breed and sex in the period 0-60 days (kg/head)

No.	Age of lambs	Breed	Twin births							
			Males				Females			
			n	$\bar{X} \pm s_{\bar{x}}$	S	CV	n	$\bar{X} \pm s_{\bar{x}}$	S	CV
1.	Birth	Țurcană	15	3.585±0.115	0.446	12.45	15	3.048±0.140	0.544	17.85
		Țigaie	14	3.902±0.132	0.494	12.66	14	3.483±0.125	0.469	13.46
2.	30 days	Țurcană	15	9.327±0.340	1.316	14.12	15	8.554±0.396	1.536	17.95
		Țigaie	14	10.177±0.410	1.534	15.07	14	9.488±0.508	1.903	20.06
3.	60 days	Țurcană	15	15.618±0.355 ^a	1.377	8.82	15	14.493±0.389	1.508	10.41
		Țigaie	14	16.627±0.532	1.991	11.97	14	15.831±0.531	1.986	12.54
4.	Total score	Țurcană	15	80.50±1.42	5.48	6.81	15	77.27±1.75	6.79	8.78
		Țigaie	14	83.21±1.50	5.80	6.97	14	80.50±2.22	8.58	10.66

^{a,b}Within a row, means without a common superscript differ (P<0.05).

The males of the Țigaie breed achieved a weight of approx. 3.902±0.132 kg, higher weight by approx. 8.84 % compared to the weight achieved at calving by males of the Țurcană breed, originating from twin births (Table 4).

Females from the Țurcană breed recorded a birth weight lower by approx. 12.5% compared to the weight achieved by the female youth from the Țigaie breed, which obtained an average calving weight of approx. 3.483±0.125 kg, weight similar to that found by other authors (Răducuță et al., 2001; Călin, 2004).

Regarding the body weight, at the age of 30 days, of the lambs from the experimental batches originating from twin births, it appears

that the only batch of lambs that exceeds the body weight of 10.0 kg is represented by the young male sheep from the Țigaie breed, which achieved a weight of 10.177±0.410 kg superior to all other lots.

The highest body weight, at the age of 60 days, of the lambs from twin births was achieved by the male biological material from the Țigaie breed, which achieved a weight of 16.627±0.532 kg, more than 1.0 kg higher the weight achieved by the male lambs from the Turcana breed. In females, the results are similar, the difference between the batches being approx. 1.34 kg, respectively 9.2% (Figure 1).

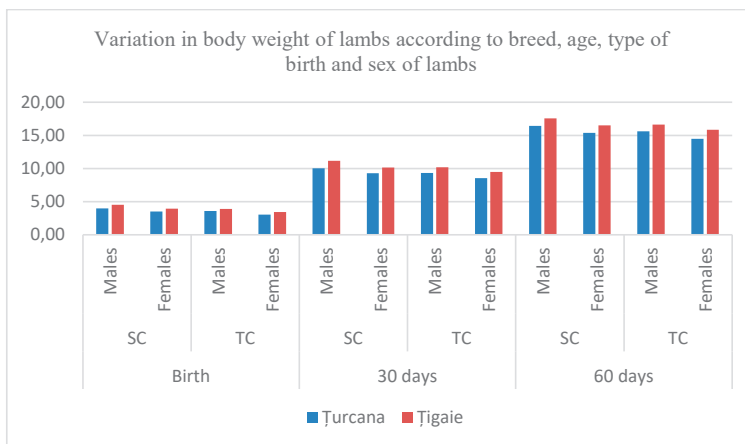


Figure 1. Body weight variation of lambs depending on different influencing factors

Table 5. The variation of body weight at calving of lambs from twin births depending on breed and sex in the period 0-60 days (kg/head)

No.	Period	Breed	Twin births							
			Males				Females			
			n	$\bar{X} \pm S_{\bar{X}}$	S	CV	n	$\bar{X} \pm S_{\bar{X}}$	S	CV
1.	0-30 days	Țurcană	15	0.191±0.013	0.051	26.96	15	0.183±0.013	0.053	28.90
		Țigaie	14	0.209±0.014	0.055	26.56	14	0.200±0.016	0.063	31.71
2.	31-60 days	Țurcană	15	0.200±0.018	0.070	35.18	15	0.190±0.015	0.059	31.01
		Țigaie	14	0.212±0.019	0.073	34.74	14	0.205±0.025	0.093	45.59

^{a, b}Within a row, means without a common superscript differ (P<0.05).

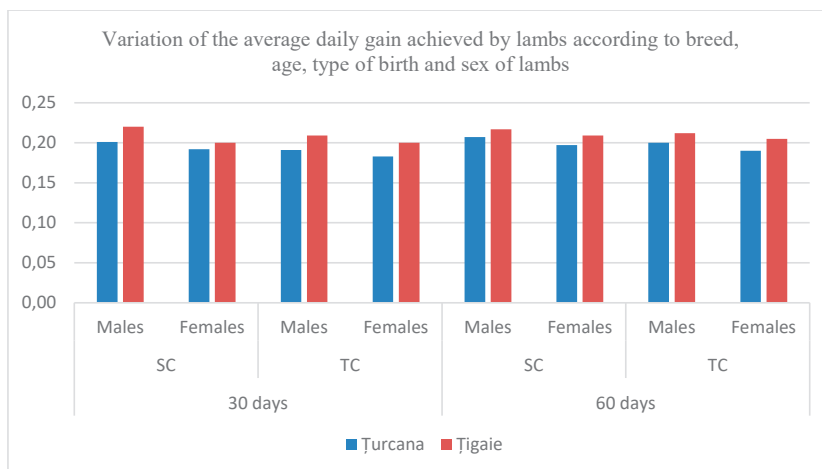


Figure 2. The variation of growth spurt in lambs depending on different influencing factors

In the case of batches originating from twin births, the lambs from the Țigaie breed achieve a higher score, both for males and females, for this parameter, no statistically guaranteed differences were found between the scores achieved by the lambs from the two breeds.

In the interval of 0-30 days, the male youth of the Țigaie breed, originating from twin births, achieves the greatest daily gain of approx. 0.209±0.014 kg/head/day being higher by approx. 9.4% of the increase achieved by the male lambs from the Țurcană breed, and the females from the Țigaie breed maintain the same trend, achieving a greater increase by approx. 9.0% compared to females from the Țurcană breed (Table 5, Figure 2).

Within the 31-60 days growth interval, the best results were obtained by the young male and female sheep from the Țigaie breed, the differences compared to the experimental batches belonging to the Țurcană breed being superior by approx. 6% in the case of males,

respectively with approx. 7.9% in the case of females.

CONCLUSIONS

The performances achieved by the lambs from the Țigaie breed, in the direction of meat production are superior to those achieved by the lambs from the Țurcană breed, both in terms of body weight achieved at different age intervals, and in terms of average daily gain and total growth rate.

Compared to the type of birth, regardless of the breed, the lambs from single births achieve superior productive performances to the groups of animals from twin births. Regarding the sex of lambs, the best results were obtained by males both in the Țigaie and in the Țurcană breeds.

From the phenotypic assessment of the aptitudes for meat production, it follows that the lambs from the Țigaie breed, in good

conditions of growth and exploitation, can achieve higher scores, which allow them to be placed in the class with "very good" appearance, which creates the premises for obtaining "good" and "very good" quality carcasses.

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