THE INFLUENCE OF THE FATTENING SYSTEM ON GROWTH RATE AND DRESSING PERCENTAGE OF THE TURCANA LAMBS BRED IN MONTAIN AREA IN THE NORTH-EAST OF ROMANIA

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Abstract

The purpose of this paper was to demonstrate the influence of growth system on the growth rate and dressing percentage of the lamb reared in Bucovina. Growing systems covered by the study are: the traditional and semi-intensive. To conduct research was purchase a total of 20 lambs weaned from Turcana breed, which were divided into two groups (about 10 lambs in each group). A lot was reared in a traditional mountain system in the shepherd of Bucovina, and the other group was subjected to semi-intensive fattening. Traditional growth is widespread in Romania, being the least expensive and easily applied by farmers, but with reduced efficiency for the production of meat. In comparison, semi-intensive system involve minimal cost with maintenance of the animals and feed preparation, but that can offer a average daily gain increases by two times higher than in the same period of time. Dynamics of average daily gain showed significant differences between the groups studied, the statistical differences are justified by the values obtained monthly and on the total period of 152 g for the lot reared semi-intensive and 59.3 g for the lot reared traditional. After slaughter were no statistical differences observed between average carcass weights with organs, but after removal the organs obtained from traditional growth carcasses were about 35% smaller leading to a distinctly significant statistical difference between groups. Selling cutting yield of 47% resulting from the slaughter lambs reared semi-intensively, is a good rate considering that Turcana breed is not specialized for meat production, and for lambs reared traditionally was registered a lower value (43%).

Key words: Turcana, growth rate, dressing percentage, Bucovina

INTRODUCTION

Raising sheep in Romania is accomplished in traditional preponderant system at sheepfold. The most important number of sheep raised in the country are Turcana breed, which is why I chose this breed for the study. Sheep raising of Turcana breed is done mainly in mountain and submontane areas due to resistance to environmental conditions and how they exploit mountain grazing [4]. In Romania, at the moment, there are the most numerous and valuable sheep Turcana, located mainly in depressionary mountains areas, but also in hilly and plain [2], [6].

In Romania sheep are exploited for milk production and less for meat production, but it is recognized that annual export a large number of live sheep in Arab countries and beyond. In 2011 were obtained and used for meat production according to MARD report an estimated 5.36 million heads of which two million heads were self-consumption and the remaining 60% were sold on domestic and foreign markets.

In the future, the increase of the production of fattened lamb meat, Turcana breed, should be the main goal due to the fact that in the last period, annual income obtains through export of fattened lambs has surpassed the income obtained by use of milk and wool [7]. With increased incomes from the sale of lambs should be increased the interest in a better utilization of feed in the

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The manuscript was received: 04.04.2012
Accepted for publication: 19.04.2012

study area by obtaining better gains and dressing percentages.

MATERIAL AND METHODS

To conduct research was purchase a total of 20 lambs weaned from Turcana breed, which were divided into two groups (about 10 lambs in each group). One lot was raised in a traditional system in a mountain sheepfold in Bucovina area, and the other group was submitted to semi-intensive fattening (on a improved mountain pasture and with additional concentrates) in the same area over a 120 days. Average weight of lambs at the time of purchase was 15 kg (and a mean age of 3 months).

The lot reared in traditional system was grown in loose housing; lambs were fed with natural hay and wheat bran (about 150 g/head/day) over the period. In terms of experimental group which has been maintained in the semi-intensive system it was fed with green mass at discretion on a improved mountain pasture, of which floristic composition was consisting mostly of grass (60%) and 40% legumes white clover respectively. In addition to green mass to the semi-intensive exploited lot has been administered wheat grain during the 120 days. The averaged amount of concentrates given was 150 g/head/day.

Fodder used were analyzed in terms of chemical composition by the standards existing:

- ISO 6496/2001 Fodder. Determination of moisture and other volatile substances.
- ISO 5984/2001 Fodder. Determination of crude ash.
- SR 13325/1995 Fodder. Determination of nitrogen content and calculation of protein content.
- ISO 6492/2001 Fodder. Determination of fat content.
- SR EN ISO 6865/2000 Fodder. Determination of crude fibber, intermediate filtering method.

Following these determinations has been determined the chemical composition of feeds used in feeding both groups of animals (tab. 1).

Table 1 Chemical composition of fodder used in animal feed

Specification	Natural hay (mountain)	Wheat bran	Improved meadow (mountain)	Wheat
Organic Mater (g/kg DM)	934	951.6	***894***	***980***
Crude ash (g/kg DM)	65.6	48.4	106	20
Crude protein (g/kg DM)	84.3	184	286	144
Crude fat (g/kg DM)	10.2	32.8	30	19
Crude fiber (g/kg DM)	363.4	90.1	175	26
Nitrogen free extract (g/kg DM)	476.6	644.7	404	791

During the four months as it took the first stage of the project, were made weighing at purchase and then on a monthly basis to the slaughter. For the weighing has been used electronic scale Bosch, 4200 PPW measurement range 0.1 kg to 150 kg and with an accuracy of 10 g. Weighing of animals was done to determine average daily growth of each individual in the two farming systems.

Slaughtering of individuals in the two experimental groups has been performed at the same weight and age. After slaughtering, were made weighing of carcasses, internal organs and skins and horns (which was the case) of individuals studied. Weighing of the parts entering into the composition of the body (organs, gastro-intestinal mass), is made using electronic scale: KPS-ACFN type 30, with measurement range 0.01 – 30 kg, with an error of 5 g and that was manufactured and distributed in the year 2010 INTERNATIONAL SRL SC SWS.

After obtaining primary data, we proceeded to calculate gain weight and slaughter indices using following relations:

Total gain = final weight - initial weight;

Average daily gain = total gain period / number of days in period;

Dressing percentage = carcass weight / live weight x 100;

Selling cutting yield = (carcass weight + weight of organs) / live weight x 100.

RESULTS AND DISCUSSIONS

Knowing the characteristics of local sheep production traits is a priority in applying technologies growth, improvement and exploitation of this species in terms of economic efficiency. Evaluation of body weight of lambs and the speed of growth is one of the most important factors in the assessment of their potential for meat production.

Factors affecting growth and body development are genetic potential of the breed and environmental factors that allow individuals to externalize genetic heritage that have been endowed. Growth rate is expressed as weight gain over a period of time (overall gain period), or weight change in a certain unit of time (average daily gain). Growth is most often expressed as weight gain. The assessment of body weight at different ages of studied lambs between the same age groups were significantly different and distinct statistically significant at ages 5 and 6 months, and at ages 3 and 4 months no statistical differences were noticed (Table 2).

Table 2 Evolution of body weight in lambs studied (kg)

Age	Semi-intensive rearing system		Traditional rearing system		*P-Value*
	$\bar{X} \pm s_{\bar{X}}$	V%	$\bar{X} \pm s_{\bar{X}}$	V%	
3 months	15.28 ± 1.328	27.48	15.42 ± 0.323	4.69	*0.9431596 ns*
4 months	19.78 ± 1.506	24.08	16.88 ± 0.468	6.20	*0.2090001 ns*
5 months	25.37 ± 1.717	21.40	18.48 ± 0.671	8.12	*0.0168928* *
6 months	29.46 ± 1.715	18.40	20.94 ± 0.871	9.30	*0.0051873* **

ns- insignificant statistical differences (*P > 0.05*)
* - significant statistical differences (*P < 0.05*)
** - distinct significant statistical differences (*P < 0.01*)

Data analysis in table 1 shows a good and very good growth for semi-intensive system rearing lot and relatively good growth in the traditional rearing. On the coefficient of variability, it was decreasing with age at sheep raised semi-intensively, because with the growth is achieved and a uniformity of the lot. For sheep reared traditional the variability values remained lower than 10%.

Growth in the period after weaning depends on more on the energy ingested level and less than their feeding management or maintenance mode (restricted, to discretion, grazing, intensive feeding at the stand, bound, etc.).

Average weight at the first weighing of the two groups studied has been approximately identical. After the first month of exploitation in the two systems it has been noticed a difference in terms of the rate of growth of lambs reared semi-intensive, they have had a weight of about 3 kg more compared with traditionally reared sheep. The same trend was maintained until slaughtering. The very good growth rate of lambs exploited the semi-intensive system was due to complete and proper disinfestations but also ensure a balanced diet. Knowledge of the average daily gain can confirm abilities of this breed for meat production and not only. If in the literature, the average daily gain of sheep bred Țurcană is on average 90-100 g per total period, the research carried out showed an average daily gain of 152.5 g for the semi-intensive reared lot similar to those carried out by the [1], [3], [5], and the lambs reared in traditional system have achieved an average daily gain for total period of 59.3 g, that would not justify raising this breed for meat (tab. 3).

The evolution of body weight of lambs experimental lot reared semi-intensive was

accumulating monthly an average of 4.7 kg with a very good growth rate and realising at the end of the period an average weight of 29 kg. Exploitation of individuals in traditional system did not allow a good growth and development of the lamb reflected by monthly gain which was about 1.8 kg leading to a average weight before slaughtering of only 21 kg.

Sheep Turcana breed proved once again that if you are assured a minimum of comfort and a balanced diet can achieve satisfactory performance.

Table 3 Dynamics of average daily gain of the lambs groups studied (g)

Period	Semi-intensive rearing system		Traditional rearing system		*P-Value*
	$\bar{X} \pm s_{\bar{X}}$	V%	$\bar{X} \pm s_{\bar{X}}$	V%	
3 – 4 months	140.6 ± 8.401	18.89	45.6 ± 5.280	25.87	*P< 0.001****
4 – 5 months	186.3 ± 9.579	16.26	53.5 ± 7.303	30.61	*P< 0.001****
5 – 6 months	131.9 ± 11.239	26.94	79.2 ± 11.834	33.39	*P< 0.05* *
Total period	152.5 ± 6.521	13.53	59.3 ± 6.524	24.58	*P< 0.001****

* - significant statistical differences (*P < 0.05*)
*** - very significant statistical differences (*P < 0.001*)

In July and August were recorded the highest values of average daily gain, contrary to expectations, since this is also the hottest period, when animals are not supposed to consume, a fact confirmed in the case of traditional rearing. Feeding management throughout the day gave the possibility of lambs reared semi-intensive to accumulate sufficient energy and nutrients in order to express their potential.

Carrying out slaughter indices of lambs was done, which before slaughter were subjected to a 15 hours diet (but with access to drinking water) and weighed both before and after diet. The results reveal that between the two groups there were differences in the weight of the lambs (tab. 4).

Table 4 Weight before slaughter and slaughter specific indices of the lambs groups studied (kg)

Specification	Semi-intensive rearing system		Traditional rearing system		*P-Value*
	$\bar{X} \pm s_{\bar{X}}$	V%	$\bar{X} \pm s_{\bar{X}}$	V%	
Live weight	29.46 ± 1.715	18.40	20.94 ± 0.871	9.30	*0.00518***
Carcass weight with organs	13.86 ± 1.024	23.35	11.10 ± 1.742	35.09	*0.16750 ns*
Carcass weight	12.02 ± 0.893	23.50	7.72 ± 0.459	23.57	*0.00895***
Dressing percentage	40.47 ± 0.875	6.84	36.53 ± 2.472	15.13	*0.08348 ns*
Selling cutting yield	46.67 ± 0.973	6.59	43.18 ± 2.488	12.89	*0.13663 ns*

ns – insignificant statistical differences (*P > 0.05*)
** - distinct significant statistical differences (*P < 0.01*)

Analysing the variability of the two groups of individuals may find that it has relatively small values inside the each lot, however, the differences between the two groups in all research parameters have been insignificant, except for weight and weight of the carcass for that differences recorded were distinct significant. Body weight of lambs reared semi-intensive was approximately 30% higher than traditional fattening group. This difference can be explained by the fact that lambs were exploited in the traditional system kept indoors permanently without access to pasture, and in terms of feed they

have not received a balanced diet. Lack of appropriate supplements for this category of individuals has led to weaker growth in muscle mass in relation to the body weight, which had a negative influence on yield at slaughter (lower by about 4 percentage points to those raised in semi-intensive system).

Immediately after slaughter, we proceeded to assess body weight components and to determine their percentage to body composition. This evaluation is important from a scientific and practical view, because the obtain data can give an overview on the development of body and hence the potential for production of meat of these animals. Data from these measurements are similar to those cited in the literature [8]. The data analysis presented in table 5. have shown that, in addition to carcass weight, gastrointestinal weight has the highest percentage of body weight, having a decisive influence on the yield at slaughter. Regarding this aspect, we can see that between the two groups of individuals have been differences in the gastrointestinal mass weight of live weight, which is higher in lambs raised traditional. Average value of body parts was expressed as a percentage of total weight from where the result that the share of carcass was about 41% for semi-intensive system and approximately 37% for individuals traditionally reared. Next as percentage of total weight was gastrointestinal mass (representing 36% to lambs reared semi-intensive and 40% for lambs reared traditionally) who had a decisive influence on the yield at slaughter.

Table 5 The average value of specific body components at studied lambs (kg)

Specification	Semi-intensive rearing system			Traditional rearing system			*P-Value*
	$\bar{X} \pm s_{\bar{X}}$	V%	% from LW	$\bar{X} \pm s_{\bar{X}}$	V%	% from LW	
Live weight(LW)	29.46 ± 1.715	18.40	100.0	20.94 ± 0.871	9.30	100.0	*0.00518* **
Carcass weight	12.02 ± 0.893	23.50	40.80	7.72 ± 0.459	23.57	36.87	*0.00895* **
Skin	3.38 ± 0.197	18.39	11.47	2.24 ± 0.040	3.99	10.70	*0.01481* *
All organs of which:	1.84 ± 0.140	24.02	6.25	1.38 ± 0.048	7.80	6.59	*0.04041* *
heart	0.20 ± 0.011	17.86	0.68	0.11 ± 0.010	19.51	0.53	*0.00036* ***
lung	0.46± 0.031	21.39	1.56	0.25 ± 0.012	10.98	1.19	*0.00039* ***
liver	0.49 ± 0.025	15.86	1.66	0.33 ± 0.020	13.37	1.58	*0.00083* ***
kidney	0.25 ± 0.023	28.49	0.85	0.12 ± 0.006	10.23	0.57	*0.00184* **
spleen	0.06 ± 0.009	48.93	0.20	0.29 ± 0.013	10.05	1.38	*P<0.001***
Intern fat	0.38 ± 0.065	54.50	1.29	0.27 ± 0.033	27.26	1.29	*0.30654 ns*
Gastrointestinal mass + blood	10.55 ± 0.475	14.24	35.81	8.39 ± 0.487	12.99	40.07	*0.01384 ns*

ns- insignificant statistical differences (*P > 0.05*)
* - significant statistical differences (*P < 0.05*)
** - distinct significant statistical differences (*P < 0.01*)
*** - very significant statistical differences (*P < 0.001*)

However, statistically, between the comparative weight of gastrointestinal mass and internal fat in the two groups there were insignificant differences, and the average values of other components are significantly different for thresholds*: P < 0.05; P < 0.01; P < 0.001*.

From this point of view, we can say that the live weight at the same age is not a big influence on gastrointestinal mass weight, being influenced more by the type of feed intake (forage and concentrates).

CONCLUSIONS

The traditional rearing system does not offer required attention for fattening lambs causing underweight animals at 6 months that involved a poor dressing percentage.

As could be observed from the study with a minimum investment regarding de-worming, administration of a balanced diet and ensure a minimum comfort were achieved gains in weight by 2.5 times greater and a selling cutting yield of 47%.

ACKNOWLEDGEMENTS

This study was made with funds provided by project POSDRU, ID 89/1.5/S62371

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