THE EFFECT OF IMPROVING CARPATHIAN BREED BY CROSSING WITH BOER BREED UPON THE CARCASSES AT THE OBTAINED HALF-BREEDS

Camelia Zoia Zamfir[1*], R. Raducu[1], Adriana Vicovan[1], Daniela Jitariu[2], Ana Enciu[1], Alina Nicolescu[1], Carmen Ana Pivodă[1], Maria Stanciu[1]

[1]Institute of Research-Development for Sheep and Goat Breeding Palas-Constanţa, Romania
[2]Ovidius University of Constanţa, Romania

Abstract

The research work aims to optimize the technology of fattening the kids and improving the quality of the carcasses by using the crossbreeding of Carpathian breed with Boer breed. It was made the fattening in intensive system, using two feeding systems: an uniform system of 92 days (with combined fodders) which assured 15.88% PBD and 89 % UN and a differentiated system with 15 days of accommodation, which assured 12.6%PBD and 91% UN, 62 days of effective fattening which assured 15.88%PBD and 89% UN and 15 days of finishing, which assured 12%PBD and 94% UN. The weight in the end of fattening was bigger at the F_1 half-breed of Boer x Carpathian comparatively to the kids of Carpathian breed, and there were no differences significant between the feeding systems. The kids of Carpathian breed had the final weight of 30.736 ± 1.0370 kg (lot 1) and 30.857 ± 0.6760 kg (lot 2), the kids of F_1 Boer X Carpathian 34.536 ± 1.0460 kg (lot 3) and 34.100 ± 1.1210 kg (lot 4). It is noticed higher daily increasing rates at the F_1 half-breed of Boer x Carpathian comparatively to the increasing rates of the kids of Carpathian breed. The daily gain of the kids Carpathian breed was 140 ± 0.0080 g (lot 1) and 134 ± 0.0100 g (lot 2) and at the F_1 half-breed of Boer x Carpathian was 154 ± 0.0060 g (lot 3) and 155 ± 0.0080 g (lot 4), not being differences significant between the feeding systems. The results of experimental slaughtering emphasize bigger carcasses and higher output at the F_1 half-breed of Boer x Carpathian. The kids of Carpathian breed had carcasses of 14.20 ± 0.9150 kg and 14.05 ± 0.8975 kg, and F_1 half-breed kids 16.25 ± 1.8750 kg and 16.48±1.8950 kg, the value of the slaughtering output was of 46.20 ± 2.9620 % and 45.50 ± 2.9510% at the kids of Carpathian breed, and at the F_1 kids of Boer x Carpathian 47.10 ± 2.9741% and 48.30 ± 2.9787%. All the obtained data show that the improving effect of the meat production at the kids of Carpathian breed by crossbreeding with Boer breed.

Key words: fattening, intensive system, accommodation, effective fattening, finishing

INTRODUCTION

The research work aims to respond to the needs of agricultural producers to optimize their technologies of exploiting goats, with the purpose of increasing the productive parameters of the farms, of increasing the economic efficiency and obtaining competitive products to those of the farmers in the European Union. The improvement of goat meat production concerns many researchers from Romania and from the whole world, due to its special culinary features, of the high biological value and of its dietetic features.

With all high interest in the goat meat product today we can admit that at global level there are few goat breeds that are specialized for the meat production. For this reason, under the name of "goat of meat" there can be included also certain combinations between the local goat breeds and breeds that are specialized for meat. The goat meat is poorer in calories and has less cholesterol comparing to the other species of animals. The proportion between the unsaturated and saturated fat acids is better, this can improve the health of the population which consume it, reducing the risks caused

*Corresponding author: zamfirzoica@yahoo.com
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by obesity or other metabolic diseases. The goat meat is a source of micronutrients, especially iron, potassium and B12 vitamin. The quality of the protein is determined by the composition and the proportion of the essential amino acids, the goat meat having values that are comparable with the other species for the content in arginine, isoleucine, lysine, methionine, threonine and tryptophan. The protein from the goat meat has a high biological value and a high digestibility per cent of 97 %. The goat meat is considered by Webb sa. 2005 as a red thin meat with high biological value [5] .

In a study published in 2005 analyzing comparatively under the aspect of the fattening performances, more goat breeds, the author points that Boer breed had the best results under the aspect of slaughtering output and of the tissue composition of the carcasses. Data regarding the potential for the meat production and the quality of the carcasses at the Carpathian breed are presented in the paper works of Bahcivangi Șt șa. [1], Neacșu C. [2], Pascal C. [3] and Taftă V. [4]. The studies of the above mentioned authors show the fact that the Carpathian breed as a certain potential for the meat production but it must be improved in the conditions in which during the last year the interest of the breeders for goat meat raised. In this context, the most practical and quick method of improving the meat production at goats is the crossbreeding (hybridization) of the local breed with breeds that are specialized for meat. From all specialized breeds, Boer breed was used mostly at crossbreeding on world level with good results and for this reason we used this breed in crossbreeding with the Carpathian breed.

MATERIAL AND METHOD

There were organized 4 experimental lots, of 15 males each, homogenous and analogue under the aspect of age and body weight. Organizing the fattening experience was made as follows: the whole period of fattening of 92 days was structured in two systems - an uniform system of feeding for the whole period (92 days) and a differentiated system - 15 days as period of accommodation, 62 days of proper fattening and 15 days of finishing. The combined fodder given in the uniform system of feeding assured 15.88% PBD and 89% UN, and in the differentiated system the nutritive levels assured were of 12.6% PBD and 91% UN in the accommodation period, 15.88% PBD and 89% UN in the period of proper fattening and 12% PBD and 94% UN in the period of finishing. In each system there were organized for each a lot of Carpathian breed and one of F1 half-breed of Boer x Carpathian. According to the experimental scheme the fodder ratios were periodically made, doing the works provided to establish the dynamics of the kids' growing, of the fodder conversion into increasing rate and of the determination of carcasses quality. The control of fattening was done through periodic individual weighing, establishing the total and daily increasing rate in relation to the feeding system. In the end of fattening period the control slaughtering was done, calculating: the slaughtering output and the tissue composition of the carcass. The statistical processing of the data was registered.

RESULTS AND DISCUSSIONS

The growing dynamics of kids during the whole experimental period is presented in table no. 1. The weight in the beginning of fattening at the kids of Carpathian breed was of 17.871±0.8260 kg (lot1) and 18.657±0.7350 kg (lot 2), and at the half-breed kids of F1 Boer x Carpathian 20.357±0.7670 kg (lot 3) and 19.818±0.8800 kg (lot 4). The weight in the end of the fattening was bigger at F1 Boer x Carpathian half-breed comparatively to that of the kids of Carpathian breed, and there were no differences between the feeding systems, so the kids of Carpathian breed had the final weight of 30.736±1.0370 kg (lot 1) and 30.857 ±0.6760 kg (lot 2), and the F1 half-breed kids of Boer X Carpathian 34.536±1.0460 kg (lot 3) and 34.100± 1.1210 kg (lot 4). There are noticed higher daily increasing rates the F1 half-breed kids of Boer X Carpathian comparatively to the increasing rates made by the kids of Carpathian breed. So, the F1 half-breed kids

of Boer x Carpathian make 154±0.0060 g (lot 3), 155±0.0080 g (lot 4) and the kids of Carpathian breed140±0.0080 g (lot 1), 134±0.010 g (lot 2), without differences between Carpathian.

Table 1 Dynamics of kids growing during fattening period

Nr. crt.	Experimental Variant	Weight in the beginning of fattening (Kg)		Weight in the end of fattening (Kg)		Average daily increasing (g)	
		$X \pm S_x$	V%	$X \pm S_x$	V%	$X \pm S_x$	V%
1	Kids of Carpathian breed (lot 1) (uniform feeding)	17.871±0.8260	17.29	30.736±1.0370	12.62	140±0.0080	21.34
2	Kids of Carpathian breed (lot 2) (diferentiated feeding)	18.657±0.7350	14.73	30.857±0.6760	8.17	134±0.010	27.23
3	Kids F1 Boer x Carpathian(lot 3) (uniform feeding)	20.357±0.7670	14.10	34.536±1.0460	9.10	154±0.0060	14.19
4.	Kids F1 Boer x Carpathian half-breed (lot 4) (diferentiated feeding)	19.818±0.8800	14.73	34.100±1.1210	12.72	155±0.0080	22.21

The obtained data show that the half-breed kids of F1 Boer X Carpathian with uniform feeding did an average daily increasing rate bigger with 10 % (distinctly significant in the statistic point of view $p<0.01$) comparatively to the Carpathian kids fed in the same system, and in the differentiated system the half-breed kids had an average daily increasing rate also bigger with 15.6% (distinctly significant statistically $p<0.01$) besides the Carpathian kids. The consumption of fodders and nutritive substances at the kids from the two genotypes is presented in tables 2 and 3. The obtained results show that the kids of all experimental lots had a similar daily ingestion of dry substance between 0.740-0.767 kg at the Carpathian kids and 0.745 – 0.776 kg at the half-breed kids. The daily consumption of energy at the uniform fed lots was of 0.76 – 0.77 UN, and at those fed differentiated was of 0.81 – 0.82 UN. In the uniform system of feeding the kids from both lots consumed 136.09 – 137 g PBD/head/day, and in the differentiated system the daily consumption of protein was of 113-114 g. The obtained data revealed the fact that providing an uniform system of feeding for the whole experimental period determined a specific consumption of fodders a little reduced comparatively to the differentiated system, both at the Carpathian kids and also the F1 half-breed kids of Boer x Carpathian. Thus, the specific consumption of dry substance in the case of uniform feeding was of 5.28 kg at the Carpathian breed and of 4.84 kg at the F1 half-breed kids of Boer x Carpathian besides 5.72 kg and respectively 5.00 kg dry substance consumed by both genotypes in the case of differentiated feeding.

Table 2 Consumption of fodders and nutritive substances at the kids from Carpathian Breed in the two feeding systems

No.	Specification	Average daily consumtion of fodders (kg)	SU/ Head /day (g)	Energy UN/ head/ day	PBD/ head/ day (g)	Mixture/ kg increa-sing rate (kg)	SU/ kg increa-sing rate (kg)	Energy UN/kg increasing rate	PBD/ kg increa-sing rate (g)
1.	Kids of Carpathian Breed (lot 1) (uniform feeding)	0.857	0.740	0.76	136.09	6.121	5.28	5.43	971
2.	Kids of Carpathian Breed (lot 2) (differentiated feeding)	0.895	0.767	0.81	113	6.68	5.72	6.04	843

Table 3 Consumption of fodders and nutritive substances at F1 half-breed kids Boer x Carpathian in the two systems of fattening

No.	Specification	Average daily consum-ption of fodders (kg)	SU/ head/ day (g)	Energy UN/ head/ day	PBD/ head/ day (g)	Mixture/ kg increasing rate (kg)	SU/ kg increasing rate (kg)	Energy UN/kg increasing rate	PBD/kg increasing rate (g)
1.	F1 half-breed of Boer x Carpathian (lot 3) (uniform feeding)	0.863	0.745	0.77	137	5.60	4.84	5.00	889
2.	F1 half-breed of Boer x Carpathian (lot 4) (differentiated feeding)	0.905	0.776	0.82	114	5.84	5.00	5.29	735

The specific consumption of energy made in the uniform feeding was of 5.43 UN at the kids of Carpathian breed and of 5.0 UN at the half-breed kids, and the specific consumption of energy in the case of differentiated foddering was of 6.04 UN at the Carpathian breed and 5.29 UN at the F1 half-breed of Boer x Carpathian. Regarding the specific consumption of protein it was noticed the fact that the lots of kids from both genotypes having uniform feeding had bigger specific consumptions, of 971g at the Carpathian breed and 889 g at the half-breed kids besides 843g of Carpathian breed and 735 g of the half-breed kids that were differentiated foddered.

The results of experimental slaughtering are presented in table no. 4. The weight of carcasses at the kids of Carpathian breed was of 14.20±0.9150 kg in the case of uniform feeding and of 14.05±0.8975 kg in the case of differentiated feeding. At the F1 Boer X Carpathian half-breed kids the weight of the carcass was of 16.25±1.8750 kg in the case of uniform feeding and of 16.48±1.8950 kg in the case of differentiated feeding, registering small differences between the two systems of feeding at each breed. The slaughtering output at the Carpathian kids was of 46.20±2.9620 % in the case of uniform feeding and of 45.50±2.9510 % in the case of differentiated feeding, and at F1

Boer X Carpathian half-breed kids the values of the output were of 47.10±2.9741 % in the case of uniform feeding and 48.30±2.9787 % in the case of differentiated feeding. The slaughtering output related to the total alive weight was between 51.10±2.9520 and 50.04±2.8925% at the kids of Carpathian breed and between 51.70±2.9898 and 52.70±3.4157% at F1 Boer X Carpathian half-breed kids. Similar results at the experimental slaughtering are obtained by Neacșu and collaborators at the fattening of the kids of Carpathian breed [2], also Taftă Vasile [4].

The tissue composition of the carcass is presented in table no. 5. At the kids of Carpathian kids, uniform fed the muscles represented 58.90 % of the carcass, fat was 15.50 % and bones were 25.60 %. The obtained results in the case of differentiated feeding of the Carpathian kids revealed values that are close to those obtained in the case of uniform feeding the muscles being 59.96 %, fat 14.92 % and bones 25.12 % in the carcass. At the F1 Boer X Carpathian half-breed kids being uniform fed the proportion of tissues in the carcass was of 62.55 % for the muscles, 15.08 % for the fat and 22.37 % for the bones. In the case of differentiated feeding the obtained data were similar to those got in the case of uniform feeding of 63.28 % per cent of muscles, 14.92 % of fat and 21.80 % of bones. The results obtained regarding the tissue composition of the carcasses revealed the fact that Boer breed used at crossbreeding with Carpathian breed improves the quality of the carcass in the sense of obtaining at the F1 half-breed kids a quantity of meat in the carcass that is bigger with 20.60-21.40 % besides the kids of Carpathian breed in the two feeding systems. Also, at the half-breed kids, the per cent of bones in the carcass was smaller with 3.23 per cent points in the case of uniform feeding and 3.32 per cent points in the case of differentiated feeding, comparatively to the Carpathian kids, fed in the same systems.

Table 4 The results of experimental slaughtering

Specifications	Kids of Carpathian breed				Kids F1 Boer x Carpathian half-breed			
	Uniform feeding		Differentiated feeding		Uniform feeding		Differentiated feeding	
	$X \pm S_x$	V%	$X \pm S_x$	V%	$X \pm S_x$	V%	$X \pm S_x$	V%
Alive weight (kg)	30.736±1.0370	12.62	30.857±1.8796	10.55	34.536±2.3514	11.79	34.100±2.5856	13.13
Weight of the carcass (kg)	14.20±0.9150	11.16	14.05±0.8975	11.06	16.25±1.875	19.98	16.48±1.8950	19.91
Slaughtering output (%)*	46.20±2.9620	11.10	45.50±2.9510	11.13	47.10±2.9741	10.05	48.30±2.9787	10.68
Slaughtering output At empty alive weight (%)**	51.10±2.9520	10.11	50.04±2.8925	10.10	51.70±2.9898	10.01	52.70±3.4157	11.22

* Output at slaughtering $= \frac{\text{Weight of cooled carcass}}{\text{Alive weight}} \times 100$

** Output at slaughtering at the empty alive weight $= \frac{\text{Weight of cooled carcass}}{\text{Empty alive weight}} \times 100$

Where empty alive weight = alive weight – gastro-intestinal content

Table 5 Tissue composition of the carcass

Specification		Kids of Carpathian Breed		F1 half-breed kids of Boer x Carpathian	
		Uniform feeding	Differentiated feeding	Uniform feeding	Differentiated feeding
Muscles	kg	4.123	4.197	5.005	5.062
	%	58.90	59.96	62.55	63.28
Fat	kg	1.085	1.044	1.206	1.194
	%	15.50	14.92	15.08	14.92
Bones	kg	1.792	1.758	1.789	1.744
	%	25.60	25.12	22.37	21.80

CONCLUSIONS

From the obtained data we have got the following conclusions:

- There were tested the fattening performances of the kids from Carpathian breed comparatively with F1 half-breed Boer X Carpathian a period of 92 days watching the effect of administering an uniform feeding system in the energetic-protein point of view for the whole period with a system differentiated in three periods -15 days accommodation, 62 days fattening and 15 days finishing
- The average daily increasing rate of the half-breed kids of F1 Boer X Carpathian was similar in the two systems of fattening, that of 154-155 g bigger with 10 – 15.6 % (distinctly significant in the point of view of statistics) besides the increasing rate of the kids of Carpathian breed in the uniform system (140 g) and respectively differentiated feeding system (134 g).
- The specific consumption of dry substance and nutritive substances (protein and energy) of the half-breed kids was smaller besides the consumption of the kids of Carpathian breed showing that by crossbreeding with Boer breed make a better conversion of fodders into increasing rates.
- The slaughtering output of the half-breed kids was of 47.10 % (uniform feeding) and 48.30 % (differentiated feeding), besides 46.2 % and respectively 45.50 % at the Carpathian kids.
- The obtained results regarding the tissue composition of the carcasses revealed the fact that Boer breed used at crossbreeding with Carpathian breed improves the quality of the carcass determining a proportion of the meat in the carcass bigger with 20.60-21.40% besides the kids of Carpathian breed in the two feeding systems and a proportion of bones smaller with 3.23 per cent points in the case of uniform feeding and 3.32 per cent points in the case of differentiated feeding, comparatively to the Carpathian fed in the same system.
- Applying the crossbreeding of Carpathian breed with Boer breed is a method that can be used to increase the meat production at goats.

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