PERFORMANCE EVALUATION FOR THE PRODUCTION OF MEAT AT YOUNG GOATS

C. Pascal[1,3*], I. Nechifor[1,2], C. Costică[1,3], M. Florea[1,2]

[1]*University of Agricultural Sciences and Veterinary Medicine Iaşi, Romania*
[2]*Agricultural Station of Research and Development for Sheep and Goat Growing Popauti-Botosani, Romania*
[3]*Agricultural Station of Research and Development for Sheep and Goat Growing Secuieni-Bacău, Romania*

Abstract

The main objective of the research carried out has been the evaluation of skills for the production of meat at young goats submissive to fattening. In this regard three batches have been established, one composed of individuals of Carpatina breed and two other composed of first generation hybrid population, males and females, obtained from crossings of the Carpatina females with he-goats of Anglonubiana and French Alpina breeds. At the end of the fattening period, it was found that the batch consisting of Carpatina pure-bred males had lower average daily increases with 21.55% and respectively 20.33% compared to the performances achieved by the F_1 males from the crossing with Anglonubiana and French Alpina. Also between batches have registered some differences with different degree of meaning for the average daily gain, exception makes the difference between the average values of this indicator calculated for batches consisting of hybrids, which was insignificant for $p \leq 0.01$. Significance analysis of the determined values for the total body mass accumulation during the fattening period was significant for $p \leq 0.05$ for all batches. In relation to the performances achieved by Carpatina males, the specific consumption of food per kg was reduced by 8% and respectively 6.56% from the two batches consisting of hybrid males.

Key words: Carpatina goat, goat meat, specific consume

INTRODUCTION

During the last sector represented by the breeding goats is recorded a sharp increase in several countries, including Romania. On the basis of EU funds destined to support farmers' modern holdings appear in which the main activity is breeding goats especially for milk production. On this backdrop, goat breeding in Romania recorded an important resurgence after 2007, being practically the most dynamic sector in which the evolution of populations is in full progress, basically following the contoured trend worldwide. In accord with the statistics data published in the year 2014, by the FAO (2016), at European level, Romania holds the largest goat herds compared with other countries which have a long tradition in goat rearing. In the year in question, the total number of goats was 1313 thousand heads (Chetroiu, 2016; Pascal, 2015), placing Romania before countries like France and Italy. Under these circumstances, by developing the goat farming rearing sector are created available effectives which can be harnessed exclusively for the production of meat, and I refer here to the fact that every year there is a surplus of males, young females which are not selected for breeding and production, but also of adult females which completed the production cycle. Basically, in the expression of the economic efficiency of rearing goats there cannot be neglected the activities that aim the organization of technological workflows specific to meat production and capitalizing on a higher level of this species not only for milk production.

MATERIAL AND METHOD

The biological material used for fattening was represented by individuals who belonged to the Carpatina breed and first generation

*Corresponding author: pascalc@uaiasi.ro
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hybrids resulting from the crossing of Carpatina females with he-goats from the Anglonubiana and the French Alpina breeds.

The fattening applied was of semi-intensive type with a total duration of 160 days. The individuals who have been subjected in fattening were assigned in three batches as follows:

- **LM** (formed of individuals from the Carpatina breed);
- **L1** (formed of individuals obtained from crossing Carpatina females with Anglonubiana he-goats);
- **L2** (formed of individuals obtained from crossing Carpatina females with French Alpina he-goats).

Each batch was formed consisting of 18 individuals represented in equal proportions by both sexes. At the end of fattening, weightings have been carried out to determine the live weight of the total increase accumulated and the average daily gain obtained from each batch during fattening. Feeding was based on administering a mixture of fodders respecting the particular nutritional requirements recommended for this breed and for this category that was subject to fattening. Depending on the nutritive value of the rations and by weighing the administered fodder and the remaining unused ones was determined the specific consumption for each experimental variant.

Data processing was performed using the REML procedure (REstricted Maximum Likelihood - of restricted maximum verisimilitude) which guarantees obtaining estimates in the normal space of parameters.

RESULTS AND DISCUSSIONS

A number of specialized sources in our country and other countries point out the increased interest of consumers also for goat meat. This food product begins to be increasingly sought more, as an alternative to other species of meat. In this context, many countries have modified the improvement programs, paying more attention to goat meat. Thus, the Netherlands, with reduced opportunities for breeding goats, is holding at this time the first place in the EU meat producers (Pascal, 2015). The statistical data given by EUROSTAT show that over the past 10 years, in the United Kingdom, France and the Netherlands is found an increase in the consumption of goat meat. To meet the demand, currently only in the United Kingdom there are around 15 commercial farms (goats bred just for meat) and over 150 private breeders who also have the same main objective of rearing goat meat.

Lately, goats are an important base of study and almost with every complex experiment, new issues that are arousing great internationally interest are highlighted. In an analysis about reproduction and improvement of goats, Shelton (1978) reported that the number of genetic studies has been limited, and among these there is little evidence to suggest progress in the development of goat rearing also as a meat animal. Research results on the genetics of the meat goat production have emerged in the speciality literature only in the last three decades (Acharya, 1982; Devendra, 1982; Cheng, 1984; Hasnain, 1985; Yalcin, 1986; Orekhov, 1980; Ying, 1995; Mason, 1996; Gall, 1996; Wen et al., 1997; Luo et al., 2000; Oman et al., 2000; Cameron et al., 2001; Zaharia, 2012). Important is the fact that in most of them, the respective articles include information obtained in various research carried out in developing countries. Studies on meat goats were negligible in terms of quantity as compared to other species of production animals, and even in this species a greater attention has been paid to the breeding of goats for production of milk and for fibre quality (Fahmy and Shrestha, 2000).

Noting this trend, the research conducted were completed objectives aimed at assessing technologies for fattening young goats, as well as an estimate of the actual availability of fattening of pure breed individuals and those that occur as a result of crossings between local goats with he-goats from more performing breeds and which demonstrated that they possess improving qualities of milk production.

To avoid the influence of some factors on the rate of accumulation of the muscle masses all batches have benefited from the same conditions of accommodation and

feeding and at the onset of fattening the age was between ± 3 days. However, as a result of carrying out the process of fattening between batches are recorded different intensities of muscle masses accumulation throughout the respectively fattening cycle.

Table 1 Evolution of corporal weight of kids during fattening

Batch	Genotype	n	Initial average weight (kg)		Final average weight (kg)		Increase gain	
			$\overline{X} \pm s_{\overline{x}}$	V%	$\overline{X} \pm s_{\overline{x}}$	V%	daily average (g)	total (kg)
LM	Males	9	11.211 ± 0.112	10.8	25.077±0.158	8.7	86.6±0.6	13.866
	Females	9	10.780 ± 0.145	12.7	24.271±0.232	6.2	81.7±0.7	13.491
L1	Males	9	12.451 ± 0.188	11.9	30.115±0.220	8.9	110.4±0.5	17.664
	Females	9	11.185 ± 0.201	10.8	28.874±0.321	10.3	110.5±0.5	17.689
L2	Males	9	11.355 ± 0.231	13.5	28.755±0.002	10.8	108.7±0.3	17.400
	Females	9	10.843 ± 0.284	12.3	27.981±0.133	9.41	107.1±0.2	17.138

The processing of data shows that, at the end of fattening, the highest live body weight was found at L2. At this lot, although the final weight was higher with 0.262 kg in males, compared to the initial weight at females, the body mass accumulation was greater with 4.82%.

Analysis of daily average gain indicates values less than 100 g/day for the batch composed from kids of Carpatina breed and in this situation the total increase of body mass gained during fattening has lower values, between 13.866 kg at males and 13.491 kg at female.

For the average daily increase between batches there have been some differences with different degree of signification, exception makes the difference between the average daily increase values determined for the two experimental batches which was insignificant for $p \leq 0.01$.

Analysis of the significance of the values determined for the increase represented of the total body mass accumulation throughout the fattening was significant for $p \leq 0.05$ between all consisting batches.

Table 2 Statistical significance of the difference found for the average daily increase and for the total average increase obtained during the fattening (g/day)

Daily average increase (DAI g/day)	Tukey Test	L2	L1	LM	Total average increase (TAI kg)
	L 2		3.78*	3.53*	
			4.05*	4.05*	
	L 1	0.006 n.s		3.79*	
		2.02 n.s		4.60*	
	LM	24.1**	23.5**		
		22.7**	24.9**		

For DAI
*for $p \leq 0.05$ ($w = 16.01$)
**for $p \leq 0.01$ ($w = 5.55$)
n.s: insignificant

For TAI
*for $p \leq 0.05$ ($w = 3.15$)
**for $p \leq 0.01$ ($w = 1.30$)
n.s: insignificant

Performances obtained by youth belonging to the local breed are similar to data in the speciality literature (Pascal, 2009 and Taftă, 1994) but for the hybrid categories there could not be identified other values published in specialized papers in the country.

Specific consumption of feed has been determined depending on the formed batches. The given ration was based on the compliance of the nutritional needs, and the ingested consumption was determined by weighing the daily ratio and the remaining uneaten remnants. At the end of the research,

after calculations, the specific consumption was determined. Obviously, as it was expected, the lower value of this index was made by the batch which had the most intense growth pace. The data obtained were processed and appear in table 3.

Table 3 Specific consumption registered at young goats during fattening (UFC)

Specification	LM		L1		L2	
	Males	Females	Males	Females	Males	Females
Phase I	5.94	4.76	4.95	5.15	4.65	5.15
Phase II	8.16	8.85	7.18	7.73	7.35	7.88
Phase III	6.62	7.21	6.08	6.44	6.19	6.64
All fattening	7.46	8.11	7.12	7.22	6.97	7.25

Data analysis highlights the fact that in the first phase, namely the accommodation, the specific consumption was located very close to 5 UFS for each batch, after which the determined values for the other phases were higher.

In the second phase between batches already occur differences, the most obvious being recorded between batches of females. Thus, at the batch consisting of Carpatina breed females the specific consumption was higher with approximately 1.5 UFC than the other batches consisting of individuals of the same sex. Regarding the batches composed of males, in the ones from L1 have obtained a kg of live body weight with specific consumption reduced by about 8% as compared to the control group.

During the entire period of fattening, males that formed L2 had a lower consumption with 2.15% compared to L1 and with 6.56% lower in relation to the consumption recorded in the control group.

CONCLUSIONS

1. The batch comprised of Carpatina breed males has recorded daily averages lower with 21.55% and respectively 20.33% compared to the performances achieved by F_1 males from the crossing with Anglonubiana and French Alpina.

2. Data on accumulation of body mass during fattening highlights differences also between batches formed only of young females, being higher with 23.73% and respectively 21.28% at hybrid batches.

3. Between batches have registered some differences with different degree of meaning for the average daily increase, exception makes the difference between the average values of this indicator calculated for batches forms of hybrid individuals, which was insignificant for $p \leq 0.01$.

4. Analysis of the meaning of the values determined for the increase represented by the total accumulation of body mass was significant for $p \leq 0.05$ between batches.

5. For the batch of Carpatina breed females the specific consumption was greater with approximately 1.5 UFC than the other batches consisting of individuals of the same sex.

6. Regarding the batches composed of males, those from L1 and L2 have developed a kg of live body weight with a more specific consumption reduced by about 8% and respectively 6.56% compared to the average consumption recorded in the control group.

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