

INFLUENCE OF THE BREED ON THE GAIN AND SLAUGHTER QUALITY OF THE KIDS MEAT

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ABSTRACT

The aim of this investigation was to determine the gain and slaughter quality of the kids of the domestic Balkan goat and its crossbreeds with alpine breed

All male kids (from domestic Balkan breed and F₁ crossbreeds between domestic Balkan breed and Alpine breed) were fed and maintained in the same conditions. After the slaughter, the measurements of each carcass, were made. The results show significant differences in birth weight of domestic Balkan breed (3,24 kg) and F₁ crossbreeds between domestic Balkan breed and Alpine breed (2,67 kg). Dressing percentage was found lower (51,94%) with pH₁ 6,56 and pH₂ 5,90 in domestic Balkan kids compared to Alpine kids (57,61%) with pH₁ 6,40 (pH of hot carcass) and pH₂ 5,76 (pH of cold carcass). Muscle tissue in three rib cut of kids was 49,46 %, fat tissue 17,35% and bones 33,19% in domestic Balkan kids. Muscle tissue from F₁ crossbreeds was 55,57%, fat tissue 18,19% and bones 26,54%.

Key words: kids, birth weight, carcass yield, meat tissue

Introduction

Kid's meat lately occupies an important place in the diet of the population, due to its high biological value. Interest in the production of meat comes from expressed fertility of goats. The Republic of Macedonia continue to dominate in the breed structure of the domestic Balkan goats (80%). There is also a large number of strains of Balkan goats, crossbreeds of different breeds, as well as crossbreeds of Balkan goats and noble breed.

Balkan goat breeding in the last decade, mainly carried out in the direction of improving production of goat meat and milk, as a breed are often used Alpina and Saanen which boasts not only a good genetic potential for milk production and high fertility. In most European countries slaughters goats with small body mass (9-14 kg), is considered a specialty and achieves a high price. The young kids has certain advantages over other types of meat, especially in a small amount of fat and light digestion (*Mioč, 1998*). Research suggests that goat production, especially goat meat, could be very lucrative due to its market demand, which in most European countries, then in the U.S. (*Glimp et al., 1986*), Canada (*Bishop, 1991*), Mexico (*Mercado et al., 1991*) exceeds the offer. Development of goats to be moving in the direction of increasing milk and meat production over the growing number of kids in the flock. Because of that fact that the kids give the biggest and best amount of meat, the objective of this research was to study qualitative and quantitative characteristics of domestic Balkan goats meat and meat from F₁ crossbreeds between domestic Balkan breed and Alpine breed.

Materials and methods

Investigations were conducted in villages in the municipality of Bitola in the Republic of Macedonia in different flocks of goats private breeders.

As a material used for testing was 10 male kids from domestic Balkan goats and 12 male kids from F₁ crossbreeds between domestic Balkan breed and Alpine breed, of average age of 114 days prior to slaughtering, placed under the same conditions, care and nutrition. The nutrition diet for kids trough the tested period was suckling and pasture. The growth of kids were followed individual

weighing in the balance of precision 0,05 kg every 10 days from birth to the slaughter. Slaughter was performed with classical method of treatment: bleeding, separation of the skin and the lower parts of feet, extracting intestines. Immediately after slaughter are weighing individual organs (the stomach and intestines, liver, heart,) skin, feet, horns, and the rest of the body. Carcasses were cut into sides along the spine according to Rulebook on quality of meat from slaughter livestock, poultry and wild game, (*Official Gazette of R. M., No. 29/74*). Three rib cut, which included 9th, 10th and 11th rib, was separated from the back, and dissected in order to separate tissues, muscle, fat, and bone tissues. The pH was evaluated immediately after slaughter (pH₁) and 24h (pH₂) postmortem in the MLD (*Musculus Longissimus dorsi*) between 13th and 14th rib, using a pH meter equipped with a penetrating electrode and thermometer, model "testo" 205.

Simple correlation between mentioned traits were calculated using a PC and the LSMLMW program (*Harvey,1990*), while strength of correlations was determined according to the *Roemer-Orphal* classification (*Latinović,1996*). The statistical significance of the effect considered was evaluated by means of the variance analysis at the level of 0.05 and 0.01. The variations between each mean value were also tested by applying the t-test.

Results and discussion

Birth weight of kids from domestic Balkan goats and F₁ crossbreeds between domestic Balkan breed and Alpine breed are shown in Table 1.

Table1. Kid's birth weight, kg

Parameters	F ₁ crossbreeds kids between domestic Balkan breed and Alpine breed	Kids from Balkan goats
N	12	12
\bar{x}	3,24	2,67
Sd	0,46	0,67
\overline{Sx}	0,13	0,21
Min	2,50	1,80
Max	3,80	3,60
Cv	14,04	25,77

The average birth weight of F₁ crossbreeds kids (3,24 kg), was higher than the birth weight of domestic Balkan goats (2,67 kg). The above difference in weight between breed was statistically significant ($p < 0.05$). The reason is the influence of breed on birth weight. Moving body weight gain and kids with 114 days of age are shown in Table 2. F₁ crossbreeds kids had significantly higher body mass (15,97 kg), with variations reported by the absolute minimum and maximum weight (12,00 – 21,80 kg), daily gain was 118,84 g, a total increase of 114 days to slaughter was 12,75 kg. Body weight of domestic Balkan goat kids was (10,84 kg), with variations reported by the absolute minimum and maximum weight (8,80 - 14,90 kg), daily gain was 71,70 g, a total increase to 114 days slaughter was 8,17 kg. Higher body weight from F₁ crossbreeds is the result of greater average daily gain than those achieved Balkan goats. Differences in body weight and increase the race is statistically significant ($p < 0.001$).

In both breed's is expressed a positive correlation between birth weight and body weight of kids where the correlation coefficient is $r_1 = 0,096$, $r_2 = 0,156$. Alpina kids body weight after slaughter was 9,43 kg or 5,78 kg in the domestic Balkan goat kids. Slaughter indicators of kids are shown in Table 3.

Share accounted feet to 3,18%, skin 8,92%, stomach and intestine 21,42% from live weight of alpina, the head of 4,92%, 0,65% heart, liver 3,34% and 1,16% cresle. Similar results were determined with the slaughter of domestic Balkan goats, with the proportion of liver 2,91% and

0,85% of cresle were less. The stomach and intestines accounted for 24,45%, feet 3,83%, skin 9,33%, 6,00% head, the heart of 0,51%.

Table 2. Body weight (kg) and kids growth (kg)

Parameters	\bar{x}	S _d	$S\bar{x}$	min	Max	cv
F ₁ crossbreeds kids between domestic Balkan breed and Alpine breed						
Body weight	15,97	2,55	0,74	12,00	21,80	15,94
Overall growth	12,75	2,51	0,73	8,70	18,10	19,69
Kids from domestic Balkan goats						
Body weight	10,84	1,72	0,54	8,80	14,90	15,86
Overall growth	8,17	1,75	0,55	7,30	11,70	21,42

Table 3. Slaughter indicators of kids

Parameters	F ₁ crossbreeds kids between domestic Balkan breed and Alpine breed		Kids from domestic Balkan goats	
	kg	%	kg	%
Body weight by slaughter	15,97	100,00	10,84	100,00
Hot carcass weight with internal organs	9,43	59,78	5,78	53,55
Cold carcass weight with internal organs	9,11	57,61	5,61	51,94
Stomach and intestines	3,36	21,42	2,60	24,45
Feet	0,50	3,18	0,41	3,83
Skin	1,40	8,92	1,00	9,33
Head	0,76	4,92	0,64	6,00
Heart	0,10	0,65	0,05	0,51
Liver	0,53	3,34	0,31	2,91
Cresle	0,18	1,16	0,09	0,85

Hot carcass weight with internal organs from F₁ crossbreeds kids was 59,78%, pH₁ measured after slaughter was 6,40. Hot carcass weight with internal organs from the domestic Balkan goats was 53,55% and pH₁ measured after slaughter was 6,56. Cold carcass weight with internal organs after 24 hours refrigeration at F₁ crossbreeds between domestic Balkan breed and Alpine breed was 57,61% and measured pH₂ which amounted to 5,76, and yield of cold body after 24 hours of cooling at domestic Balkan goats was 51,94% and measured pH₂, which amounted to 5,90. The mean pH₁ values of meat from bought breed (6,40 – 6,56) and pH₂ (5,76 – 5,90) considered optimal for high-quality goat meat (*Dhanda et al., 2003*). Our results are nearly identical with the results of which indicate (*Mioč, 1998*) of 57,5%, for alpina kids, and (*Živković and Knežević, 1991*) of 50,1% (*Memiši et al., 2004*) of 58,26%, 45,23% yield for Balkan kids. Yield is quite variable and depends on two groups of factors: factors which effect before slaughter (genetics, body weight, breed, diet, the period of slaughter, sex, health status) and factors which affect after slaughter (technological processing of slaughter and cooling). The tissue share (muscle : bone : fat) of kids meat is shown in Table 4.

Table 4. Share and ratio of tissues in three rib cut of kids

Breeds	Muscle tissue (%)	Bone tissue (%)	Fat tissue (%)
F ₁ crossbreeds kids	55,27	26,54	18,19
Kids of domestic Balkan goats	49,46	33,19	17,35

In our investigation determined the value of muscle tissue from F₁ crossbreeds between domestic Balkan breed and Alpine breed was 55,27% and 49,46% of the domestic Balkan goat kids. The difference of 5,81% occurs in bone tissue, or 6,65% of fat in favor alpina kids. These differences indicate that breed has an impact on the tissue composition of kid's meat, because they are significant and statistically significant ($p < 0.01$).

Conclusion

Based on test results set from carcass traits of domestic Balkan goats and F₁ crossbreeds between domestic Balkan breed and Alpine breed, can perform the following conclusions: The average birth weight of F₁ crossbreeds between domestic Balkan breed and Alpine breed was 3,24 kg and was statistically higher than the birth weight of domestic Balkan kids, which amounted to 2,67 kg ($p < 0.05$).

Larch F₁ crossbreeds between domestic Balkan breed and Alpine breed, had significantly higher body weight of 15,97 kg than domestic Balkan kids 10,84 kg, and hight average daily gain to 114 days (118,84g : 71,70g) and ($p < 0,001$).

In both breed's is expressed a positive correlation between birth weight $r_1 = 0,096$ and body weight with correlation coefficient $r_2 = 0,156$. Carcass yeld from F₁ crossbreeds between domestic Balkan breed and Alpine breed, is higher than the carcass yield for the Balkan kids (59,78% : 53,94%), and the yield of cold carcass weight after 24 hours of cooling (57,61% : 51,94%). The average weight of the liver and the cresle at F₁ crossbreeds was higher than those in the Balkan kids. Slightly higher concentrations stomach and intestines, feet, skin and head were determined by the domestic Balkan kids.

F₁ crossbreeds between domestic Balkan breed and Alpine breed were significantly higher ($p < 0.05$ and $p < 0.01$) proportion of meat (muscle tissue) from the domestic Balkan kids (55,57% : 49,46%) and adipose tissue (18,19% : 17,35%).

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