

# SLAUGHTER RESULTS FOR KIDS OF THE DOMESTIC BALKAN GOAT \*\*

N. Memiši<sup>1\*</sup>, M. Žujović<sup>2</sup>, Z. Tomić<sup>2</sup>, M. P. Petrović<sup>2</sup>

<sup>1</sup> AD Mlekara – Subotica;

<sup>2</sup> Institut za stočarstvo, Beograd-Zemun

\* Corresponding author: [memisin@mlekara.rs](mailto:memisin@mlekara.rs)

\*\* Original scientific paper

**Abstract:** The paper presents the investigation of slaughter results, i.e. meat production results, in 96 kids of the domestic Balkan goat (4 herds, 24 animals per herd, 50:50 sex ratio), slaughtered at 90 days of age to determine the differences between the herds investigated and sexes (male kids vs. female ones), pertaining to the quantitative characteristics of meat. The average warm carcass dressing percentage including the head and offal for kids from all the herds investigated was 58.19%. The differences established for dressing percentage, warm, cold, and cold with and without head and offal, between the herds investigated and sexes were not statistically significant ( $P > 0,05$ ). Established differences between linear measurements for kid carcass halves, were statistically significant ( $P < 0,01$ ) between herds, whereas pertaining to the sex of kids, they were significant on both levels ( $P < 0,01$  and  $P < 0,05$ ).

**Key words:** domestic Balkan goat, kids, sex of kids, slaughter results

## Introduction

No statistical records were kept concerning the number of our goats and their breeding because the goat keeping in Serbia was banned for a long period of time. The number of kids and goats that are yearly slaughtered here is not negligible. However, they are not available on the market, since most kids and even grown up goats are slaughtered and consumed on the farms where they were raised (*Memiši and Bauman, 2007*). That is why our market is poorly supplied with this sort of meat. Over the last few years the interest for breeding these very useful domestic animals changed considerably in Serbia. The number of those who are trying to establish the goat production or to enlarge their herds is increasing. In some regions this trend is especially extensive. This indicates that an increased supply of the goat meat of all categories can be soon expected on our market. Apart from the legal standards defining the quality of the goat meat of all categories as well as the quality of the animals slaughtered

it would be necessary to prescribe some other details relative to the preparation of these animals for the market (*Žujović et al., 1984*)

Since our literature lacks the reference on the fattening traits and the slaughter characteristics of the certain goat genotypes that are raised in Serbia (with the exception of works by *Memiši, 2000*), we wished to point to the fattening traits and some slaughter characteristics found in the kids of the domestic Balkan goat. An additional reason is that, up to now, the Balkan goat has participated, in a high percentage (about 40%), in the breeds composing the total goat population in our country (*Memiši and Bauman, 2002* and *Memiši et al., 1998*).

## Material and methods

The research was carried out on the herds of the Balkan goat on the farms of individual breeders in the villages from the Prizren municipality, over a three years' period. Four herds of the Balkan goat were used as a material, and their productive and reproductive traits were observed during two years. In the third year, the fattening ability was tested, i.e. the production of meat in the 96 kids (24 kids in each herd, the sex ratio was 50:50), that were slaughtered at the age of 90 days at the "Progres-Export" slaughterhouse, at Prizren. After to cutting the carcasses in half, the following linear measures were taken (cm): Pubic bone – hock, pubic bone – 1 st rib, pubic bone – Atlas, pubic bone – knee joint and the circumference of thighs.

The statistical processing of the results pertinent to the slaughter traits in kids was performed on a personal computer, using the LSMLMW program (*Harvey, 1990*). The following processing model was created to estimate the slaughter traits in the kids of the domestic Balkan goat, with reference to the herds and the sex of kids:

$$Y_{ijkl} = \mu + S_i + P_k + e_{ijkl}$$

where :

$Y_{ijkl}$  = the phenotypic value of the particular traits included in the analysis,

$\mu$  - an overall average value,

$S_i$  - the fixed farm effect, i.e. the herd effect ( $i = 1, \dots, 4$ ),

$P_k$  - the fixed effect of the sex of kids ( $k=1,2$ ),

$e_{ijkl}$  - the other undetermined effects (an accidental error).

The statistical significance of the effect considered was evaluated by means of the variance analysis at the level  $P=0,05$  and  $P=0,01$ . The variations between each mean value were also tested by applying the t-test.

## Results and discussion

Table 1 gives the mean values for the weight of the warm and cold carcass with and without the head and offal, as well as the total yield of the meat of the kids slaughtered, classified per herds and sex.

**Table 1. Mean and variability of body and carcass weight of fattened kids**

Traits examined	Class					
	Flock				Sex	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	M	F
	LSM±Sx (n=24)	LSM±Sx (n=24)	LSM±Sx (n=24)	LSM±Sx (n=24)	LSM±Sx (n=48)	LSM±Sx (n=48)
BWB, kg	2.70±0.07	2.71±0.08	2.69±0.07	2.69±0.08	2.77±0.06	2.62±0.05
BW90, kg	13.37±0.17	14.07±0.21	13.21±0.24	13.85±0.22	13.83±0.16	13.42±0.14
ADG 0-90, g	118±1.61	126±1.72	116±2.06	123±1.96	123±1.42	120±1.32
BMPS, kg	12.90±0.23	13.54±0.22	13.07±0.16	13.72±0.20	13.50±0.22	13.12±0.14
WWCHG, k	7.59±0.07	7.95±0.09	7.52±0.12	7.89±0.10	7.86±0.08	7.62±0.06
DPWCHG %	58,10±0,29	57,98±0,25	58,34±0,28	58,36±0,26	58,26±0,19	58,13±0,19
WCCCG kg	7,28±0,07	7,62±0,09	7,21±0,12	7,54±0,10	7,53±0,07	7,29±0,06
DPCCHG, %	55,71±0,27	55,60±0,24	55,94±0,26	55,73±0,24	55,83±0,18	55,66±0,17
WCCHGkg	5,93±0,05	5,20±0,06	5,84±0,09	6,07±0,07	6,10±0,05	5,92±0,04
DPCC %	45.31±0.26	45.22±0.25	45.34±0.28	44.89±0.28	45.23±0.19	45.15±0.18

<sup>1)</sup> BWB - Body weight at birth, BW90 - Body weight with 90 days, ADG0-90 - Average daily gain 0-90 days, BMPS- Body mass prior to slaughtering,, WWCHG- Weight of warm carcass with head and giblets, kg., DPWCHG- Dressing percentage of warm carcass with head and giblets, %, WCCHG- Weight of cold carcass with head and giblets, kg., DPCCHG- Dressing percentage of cold carcass with head and giblets, %, WCCHG- Weight of cold carcass without head and giblets, kg., DPCC- Dressing percentage of cold carcass, %.

Average body weight of kids after 90 days of fattening, for all investigated herds was 13.62 kg (Table 2), and all body weights were approximately similar, ranging from 13.21 kg (Herd 3) to 14.07 kg (Herd 2). Differences established between Herd 1 and Herd 2 of 0.70 kg, and Herd 3 and Herd 2 of 0.85 kg, in favor of Herd 2, were statistically significant ( $t_{exp} = 2.57^*$  and  $2,27^*$ ).

The highest average daily weight gain was found in kids from Herd 2 (126.10 g), and lowest in kids from Herd 3 (116.70 g). Overall, during the whole fattening period, average daily gain for male kids was 123 gr, and for females 120 gr, while the difference of 3 gr in favor of males was not statistically significant ( $P>0.05$ ).

The variance analysis results indicate that the differences found in the mass of warm and cold carcass with and without the head and offal were statistically

significant ( $P < 0,01$ ) among the herds examined, while these differences were at the level  $P < 0,05$  when referring to the sex (male and female kids). The differences estimated for the mass of the warm carcass were statistically very significant: between the third and the fourth herd ( $t_{\text{exp}} = 4,34$  \*\*\*), the fourth and the first ( $t_{\text{exp}} = 5,48$  \*\*\*), the third and the second ( $t_{\text{exp}} = 5,11$  \*\*\* and  $5,53$ \*\*\*). The other differences were not statistically justified. As the case was with the mass of the warm carcass, the values for the mass of the cold carcass with and without the head and offal were determined in the same manner.

The average yield of the warm carcass with the head and offal is 58,19% in the kids from all the examined herds. It is evident that the highest yield of the warm carcass was achieved by the kids from the fourth herd 58,36% while the lowest yield was 57,98% and it was produced in the second herd. The differences that were estimated for the yield extent, among the herds examined and for kids of both sexes, were not statistically justified ( $P > 0,05$ ) for both warm and cold carcass, with and without the head and offal.

Table 2 presents biometric values of the linear measures taken on the carcasses halves of the fattened kids, up to 90 days of age.

**Table 2. Mean and variability of the carcass halves linear measures**

Traits examined	Class					
	Flock				Sex	
	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>	M	F
	LSM±Sx (n=24)	LSM±Sx (n=24)	LSM±Sx (n=24)	LSM±Sx (n=24)	LSM±Sx (n=48)	LSM±Sx (n=48)
PB – H <sup>1</sup> , cm	27.45±0.20	28.17±0.27	27.33±0.18	28.19±0.26	28.09±0.17	27.48±0.16
PB- 1R, cm	52.44±0.22	54.04±0.19	52.04±0.20	53.56±0.21	53.13±0.17	52.73±0.19
PB – A, cm	63.33±0.27	64.94±0.25	63.46±0.22	64.19±0.33	64.28±0.23	63.68±0.18
PB– KJ, cm	16.19±0.17	16.83±0.20	15.89±0.17	16.96±0.17	16.64±0.14	16.29±0.14
CTH, cm	26.10±0.18	27.04±0.20	26.31±0.21	27.31±0.20	26.88±0.16	26.50±0.15

<sup>1)</sup> PB-H - Pubic bone – hock; PB-1R - pubic bone – 1<sup>st</sup> rib; PB-A - pubic bone – Atlas, PB-KJ - pubic bone – knee joint; CTH - the circumference of thighs.

Established differences between linear measurements for kid carcass halves (pubic bone – 1st rib, pubic bone – hock, pubic bone – Atlas), were statistically significant ( $P < 0,01$ ) between herds, whereas pertaining to the sex of kids, they were significant on both levels ( $P < 0,01$  and  $P < 0,05$ ). Male kids had higher values of linear measurements for carcass halves than female kids, while the difference between the sexes was statistically significant ( $P < 0,01$ ).

Carcass meat yield index, calculated from the ratio between the weight of cold carcass and carcass length (table 3), for all kids in investigation was 7,44.

The highest carcass meat yield index (7.54) was established for kids from Herd 2, and the lowest (7.36) for those from Herd 3. In addition, male kids had a somewhat better carcass meat yield index (7.49) as compared to female kids (7.38).

**Table 3. Index of meat yield carcass**

Class	Weight of cold carcass (kg)	Carcass length (cm)	Meat yield Index
$\mu$	6,01	80,8	7,44
<b>Flock</b>			
F <sub>1</sub>	5,93	79,89	7,42
F <sub>2</sub>	6,20	82,21	7,54
F <sub>3</sub>	5,84	79,37	7,36
F <sub>4</sub>	6,07	81,75	7,42
<b>Sex</b>			
Male	6,10	81,40	7,49
Female	5,92	80,21	7,38

**Table 4. Index of meat yield for haunches**

Class	Width of both haunches (cm)	Length of haunch (cm)	Index of meat yield for haunches
$\mu$	12,38	27,78	44,56
<b>Flock</b>			
F <sub>1</sub>	12,21	27,45	44,48
F <sub>2</sub>	12,56	28,17	44,58
F <sub>3</sub>	11,96	27,33	43,76
F <sub>4</sub>	12,79	28,19	45,37
<b>Sex</b>			
Male	12,56	28,09	44,71
Female	12,20	27,48	44,39

The meat yield index for haunches (Table 4), calculated from the ratio between the width of both haunches and haunch length, was highest in kids from Herd 4 (45.37), while kids from Herd 1 and Herd 2 had virtually the same meat yield indexes (44.48 and 44.58).

According to available publications, obtained results for values of weight of the warm and cold carcass with and without the head and offal and values of dressing percentages that are established by kids of Domestic balkan goat, are at the same level as the ones established by researches of *Becerril-Herrera et al.*, (2006), for kids of Mexican Creole goat; *Marichal et al.*, (2003), for values of dressing percentages for kids slaughter with different body weight (from 6 to 15

kg) and *Kor and Ertugrul* (2000) investigating slaughter results and meat quality for kids of Akkeci goat breed. Similar values of cold dressing percentages (without the head and offal) for male kids, that are at the level of ones which were found during this investigation (45,23%), have obtained in their researches *Daskiran et al.*, (2006), investigating slaughter results for male kids of local Norduz goat breed which is actually distributed in region Van Province - Turkey, in either intensive (41,49%) or pasture conditions (44,63%).

## Conclusion

On analysing the fattening and slaughter results regarding the kids of the domestic Balkan goat that is raised in the region to the north-west of the Šarplanina massif, the following can be concluded:

- In fattening during suckling period, until the age of 90 days, the finishing body mass of kids was 13,62 kg (13,83 kg males and 13,42 kg females) and the average daily weight gain was 121,20 g (123,0 g male and 120,0 g female kids).

- The average yield of the warm carcass with the head and offal in the kids from each herd totals 58,19%, while the average yield of the cold carcass without the head and offal in the kids from each herd reaches 45.19%. The variations determined in the mass of the warm and cold carcass with and without the head and offal were statistically significant ( $P < 0,01$ ) among the herds examined, whereas, these differences as related to the sex (male or female sex) were expressed at the level  $P < 0,05$ .

- Established differences between linear measurements for kid carcass halves (pubic bone – 1st rib, pubic bone – hock, pubic bone – Atlas), were statistically significant ( $P < 0,01$ ) between herds, whereas pertaining to the sex of kids, they were significant on both levels ( $P < 0,01$  and  $P < 0,05$ ).

## KLANIČNI REZULTATI JARADI DOMAĆE BALKANSKE KOZE

*N. Memiši, M. Žujović, Zorica Tomić, M. P. Petrović*

## Rezime

Proizvodnja kozjeg mesa u svetu, iako je četiri puta manja od proizvodnje mesa ovaca, ima veliki značaj za mnoge zemlje, a naročito za zemlje Azije, Afrike i Južne Amerike. U zemljama Evropske zajednice je proizvodnja kozjeg mesa od znatno manjeg značaja i obima, a naročito u zemljama gde se gaje mlečne rase koza i u kojima je meso prateći proizvod. Mada će i u našim

uslovima osnovni proizvod koza biti, uglavnom, mleko, proizvodnja mesa se ne sme zanemariti. Treba pravilno iskoristiti visoku potencijalnu mogućnost koza za dobru plodnost. Ova sposobnost koza može jako dobro da se iskoristi pri dvokratnom jarenju, i to tamo gde je proizvodnja jarećeg mesa rentabilnija od proizvodnje mleka i gde je iz bilo kojih razloga smanjen interes za proizvodnju mleka, ili pak nema uslova za organizovano unovčavanje većih količina mleka, niti za njegovu preradu.

U radu su prikazani rezultati ispitivanja uticaja ishrane na klanične rezultate tj. proizvodnju mesa kod 96 jaradi domaće balkanske koze (4 stada, po 24 jaradi u svakom stadu i odnosom polova 50:50), koja su zaklana u uzrastu od 90 dana u cilju utvrđivanja razlika između ispitivanih stada koza i polne pripadnosti jaradi (muška i ženska grla). Prosečan randman toplog trupa sa glavom i iznutricama kod jaradi svih ispitivanih stada iznosi 58,19%. Razlike koje su utvrđene u masi toplog i hladnog trupa sa i bez glave i iznutrica, bile su statistički značajne ( $P < 0,01$ ) između ispitivanih stada, dok su te razlike u odnosu na polnu pripadnost (muška i ženska grla) bile izražene na nivou  $P < 0,05$ . Rezultati analize varijanse pokazuju da su evidentirane razlike između utvrđenih linearnih mera na polutkama jaradi, bile statistički signifikantne ( $P < 0,01$ ) među stadima, dok su u odnosu na polnu pripadnost jaradi one bile značajne na oba nivoa ( $P < 0,01$  i  $P < 0,05$ ).

**Ključne reči:** domaća balkanska koza, jarad, pol jaradi, klanični rezultati

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