

STUDIES ON WEIGHT GAIN, OUTPUT AND QUALITY OF
MEAT FROM LAMBS CASTRATED BY ELASTRATION

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In our country the castration of male lambs is mainly effected by percutaneous smashing of the semen ducts with the Bordizzo pliers.

For the applications of the castration as an economic operation, have been studied many different methods /1,2,3,4,5,6,7,8,9/. The ever more increasing use of elastic rings lately for castration of lambs, made necessary the establishing of advantages and drawbacks of this method, as related to weight, output and quality of the derived meat and subproducts.

Material and methodics

Tests were effected on lambs, pure zygaya crossbreds, of 60-80 days of age and 16-26 kg liveweight.

The animals, selected after the method of analogues, were distributed in three groups:

I group - controls, not castrated lambs

II group - lambs castrated by Bordizzo

III group - lambs castrated by elastration

Feeding and general conditions were equal for all three groups.

The weight and linear growth of the animals was accounted for daily. To establish the best economic age for slaughter, were made tests on 7, 8 and 9 months of age.

By slaughter analysis on 12 lambs of each age group was established: weight percentage of meat without head and liver /trachea, lungs, heart, liver/ to live weight; the weight percentage of the skin /not processed/, head, liver, intestines and peritoneum, glands /mesenterial lymph glands/ as related to the weight of the meat.

The relation meat - bone was established after the boning operations of cooled to 4 °C carcasses of lambs - analogues, by age groups.

The chemical analysis of the meat was made on a mean sample, taken after the boning operation and followed by homogenisation of the whole carcass. Total protein of the meat we determined after Kjeldahl, total fats after Socslet, quantity of oxyprolin in mg% after Neuman and Logan, triptophan in mg% after Block and Bolling.

The organoleptical evaluation of the indices: flavour, taste, colour and tenderness of the meat, with two thermal processes, backed shoulder, and boiled meat of m. triceps brachii, we made with the 5 point system, by 7 trained degustators. The obtained data was processed after the variation-statistical method.

The statistic processing of the obtained results, for evaluation of the factor castration, we made by the use of the monofactor analyses and the F criteria: $F = \frac{\sigma_e^2}{\sigma_i^2}$,

where σ_e is the dispersion between the groups, and σ_i is the dispersion within the groups themselves.

Results and discussion

The statistic proof of the differences for the relation I to II and III groups is given on column 6 of table 1 and in columns 6, 11 and 16 of table 2, and for the differences between II and III groups accordingly, on column 7 of table 1 and columns 7, 12 and 17 of table 2.

Total statistical data for the weight growth of the animals from the three groups, are given in table 1.

Table 1

Age months	number of animals	mean arithmetical weight in kg			I-II,III	II-III
		I	II	III	P	P
1	2	3	4	5	6	7
starting weight	60	22,400	22,400	22,500	-	-
5	60	30,700	29,400	29,100	> 0,05	> 0,05
6	60	35,200	33,900	33,100	> 0,05	> 0,05
7	59	41,100	37,500	36,500	< 0,01	> 0,05
8	47	45,100	41,100	39,800	< 0,01	> 0,05
9	35	49,300	44,400	43,000	< 0,01	> 0,05

The results show that best weight growth show the lambs from group I - not castrated, with mean dayly gain for 150 days - 0,180 kg, with 0,147 kg for group II, and 0,137 kg for group III. As it is evident, statistical proof show only the differences of the mean arithmetic weight between castrated and not castrated animals after the 7th month /P < 0,01/.

Total statistical data for meat and subproducts output are given in table 2.

From the table **it** is evident: For the basic indices /meat, bones, skin output/ that a statistical proof is observed for the differences / $P < 0,01$ / between the mean arithmetic values of the control group and the groups of the castrated animals. The values of the meat and output for the castrated animals are bigger, while those for the bones and skin are smaller in comparison to the control group. For the most part of the indices, the differences between the results for the two methods of castration have no statistical proof / $P > 0,05$ /, and when they show statistical proof, the differences are very small.

Results from the evaluation for the chemical composition of the meat are given in table 3.

Table 3

No	Indices	age								
		7 months			8 months			9 months		
		I	II	III	I	II	III	I	II	III
1	Water in content %	63,7	61,7	61,2	62,2	59,7	59,2	61,7	59,1	58,6
2	Dry substance in %	36,3	38,3	38,8	37,8	40,3	40,8	38,3	40,9	41,4
3	Total protein in %	16,9	16,1	16,0	16,6	15,8	15,7	16,2	15,4	15,2
4	Total fats in %	18,0	21,1	21,6	19,8	23,2	23,8	20,9	24,2	25,0
5	Oxyprolin in mg%	40,3	35,8	34,7	15,9	15,6	14,2	14,3	13,7	12,2
6	Triptophan in mg%	200,0	214,0	213,0	215,0	223,0	230,0	241,0	263,0	278,0

The results show, that with age increase of the lambs, the percent content of water and total protein in meat decreases, while that of the total fats, increases. Further to that, water content in the meat of castrated lambs is about 3% lower than that of meat from not castrated lambs, while total fats are 3-4% higher. It is observed that oxyprolin content of the meat from castrated lambs is lower than that in meat from not castrated lambs, while oxyprolin content in meat of lambs castrated by elastration is about 1% lower than that of lambs castrated by Bordi-

The statistical processing of the result from the degustations show that differences between the mean arithmetic evaluations of the degustators for the three groups in relation to the organoleptic indices: flavour, taste, colour and tenderness of the meat, differentiate between themselves by 0,1 to 0,3, but these differences proved statistically insignificant.

C O N C L U S I O N S

1. With equal age, not castrated male lambs exhibit higher live weight in comparison to castrated lambs.

2. With equal live weight, meat output from castrated lambs is higher than that of not castrated and vice versa, bones and skin weight is lower. Weight of fat of 7 and 8 month old castrated lambs is higher, but there is a tendency for egalization toward the 9th month.

3. Water and total protein content of meat from castrated lambs is lower than that in meat from not castrated lambs, while that for total fats is higher.

4. Oxyprolin content in meat from castrated and not castrated lambs, with age decreases/becomes smaller/, while that of triptophan augments. In meat from castrated lambs oxyprolin content is lower than that of meat from not castrated lambs.

5. Since significant differences in the indices for output and organoleptical qualities of the meat from lambs castrated by Bordizzo and elastration, are not exhibited, preference should be decided upon from the fact that, the castration by elastic rings ensure total emasculinisation, the method is relatively painless for the animals, it is effected easily and rapidly, and there is no need for special qualification of the operating personnel.

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TABLE 2

No	INDICES	7 MONTH OF AGE					8 MONTH OF AGE					9 MONTH OF AGE						
		Mean arithmetic			I - II, II-III III		Mean arithmetic			I - II III		Mean arithmetic			I-II III		II-III	
		I	II	III	P	P	I	II	III	P	P	I	II	III	P	P		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1.	Output %	47,7	49,5	50,0	<0,01	>0,05	47,9	49,3	49,2	<0,01	>0,05	49,7	50,5	51,0	<0,01	>0,05		
2.	Bones %	19,2	17,6	17,7	<0,01	>0,05	17,9	16,9	16,8	<0,01	>0,05	18,0	17,2	16,2	<0,01	<0,01		
3.	Skin %	22,0	20,2	19,1	<0,01	>0,05	20,6	17,8	17,4	<0,01	>0,05	19,7	18,0	17,6	<0,01	>0,05		
4.	Head %	7,7	7,8	7,8	>0,05	>0,05	7,75	7,5	7,3	<0,01	<0,01	7,2	7,0	7,1	>0,05	>0,05		
5.	Liver %	7,6	7,7	7,4	<0,01	<0,01	7,55	7,8	7,8	<0,01	>0,05	7,6	7,5	7,7	<0,01	>0,05		
6.	Periton.%	1,7	2,1	2,4	<0,01	<0,01	2,4	3,0	3,1	<0,01	>0,05	2,7	3,1	3,3	<0,01	>0,05		
7.	Glands %	2,1	2,1	2,1	>0,05	>0,05	2,75	3,10	3,33	<0,01	<0,01	2,8	2,6	2,6	>0,05	>0,05		
8.	Intestins%	4,4	4,5	4,5	>0,05	>0,05	3,65	3,3	3,5	<0,01	>0,05	3,5	3,5	3,4	>0,05	>0,05		
9.	Bowels%	1,2	1,05	1,05	<0,01	>0,05	1,07	1,1	1,26	<0,01	<0,01	1,1	1,03	1,03	>0,05	>0,05		
10.	Meat kg	17,5	17,7	17,7	>0,05	>0,05	20,2	20,8	20,5	<0,01	<0,01	23,2	22,6	22,2	>0,05	>0,05		