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VALORISATION OF THE GENETIC DIVERSITY OF THE LOCAL SHEEP BREEDS IN ROMANIA, TO PRODUCE QUALITY TRAITS OF THE CARCASS ACCORDING TO MARKET DEMANDS

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Introduction

Although the objectives of sheep production are multiple (milk, meat, wool, hides), in many countries worldwide, the main direction is meat production (Orman A., 2008; Revilla, I, 2008). In Romania, sheep meat consumption still is quite low, most of the meat coming from culled animals which were in a poor or mediocre state of maintenance, and from unfattened lambs slaughtered for meat at early ages and low body weights.

In Romania, the suckling lamb meat is the preponderant type of production demanded on the market for sheep products. Quality carcass in suckling lambs depends on many factors such as breed, slaughtering weight, sex, feeding and weaning age. Lambs slaughtering at low weights is unprofitable because it is unusable just during the period when the lambs have the highest growth speed (large weight gain), limiting largely the profits of producers.

OBJECTIVE

The purpose of the paper is to study the influence of the sheep breed on the carcass quality of the suckling lambs from three local breeds: Carabash, Tsigai and Tsurcan. The paper is part of a larger study on the quality of carcasses from suckling lambs, fattened lambs and adult animals, all from local breeds.

Material and Methods

The research was conducted on INCDBNA premises on 45 suckling lamb carcasses from the following local breeds: Carabash -15 lambs, Tsigai -15 lambs, and Tsurcana -15 lambs.

The following parameters were determined: live weight and weight of the cold carcass, slaughter (slaughterhouse and commercial) yield, proportion of carcass parts, meat to bone ratio in carcass components, subjective grading and classification of carcasses, evaluation of the organoleptic traits comparatively between breeds and the gross chemical composition of the meat.

The carcasses were cut according to the French methodology (Cuc Aurelia, 2003), which uses the following parts: leg, loin, rack, shoulder, flank and neck.

The lamb carcasses were classified according to their weight, in three categories: A, B and C. There were two qualities for each category, evaluated according to:

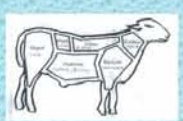
- meat colour: clear pink / pink, other colours
- fattening stage, with four categories: very lean, lean, medium, fat, as shown below.

- Very lean. Inexistent or very thin layer of body fat.
  - Outside: no fat or traces of fat.
  - Inside: thorax – no fat or traces of fat between ribs.
- Lean. Body slightly covered in fat, almost all muscles can be seen.
  - Outside: thin layer of fat covering part of the carcass, less present on the limbs
  - Inside: thorax – muscles clearly observed between ribs.
- Median. Muscles, except for the hind legs and shoulder, almost completely covered in fat.
  - Outside: thin layer of fat covering most, or the entire carcass. Fat layer thicker at tail basis.
  - Inside: thorax – muscles still visible between ribs; thin layer of fat inside the thorax box.
- Fat. Muscles covered in fat, but still partially visible at the hind legs and shoulder.
  - Outside: thin layer of fat covering most, or the entire carcass; it can be thinner on the limbs and thicker on the shoulder.
  - Inside: thorax – intercostal muscles may be infiltrated with fat. Visible fat deposits on the ribs.

Lamb carcass classification

Category	A		B		C	
Weight (kg)	≤7.0		7.1-10.0		10.1-13.0	
Quality	1	2	1	2	1	2
Meat colour	Clear pink	Other colour	Clear pink/pink	Other colour	Clear pink/pink	Other colour
Fat layer	(2) (3)	(1) (4)	(2) (3)	(1) (4)	(2) (3)	(1) (4)

Tsigai and Tsurcana lambs



Carcass parts

Carabash lambs

Results and discussion

Carabash lambs carcass

Tsigai lambs carcass

Tsurcana lambs carcass

Live weight, slaughtering yield and proportion of suckling lambs carcass parts

		Carabash lambs		Tsigai lambs		Tsurcana lambs	
		$\bar{X}\pm S_{\bar{X}}$	Cv%	$\bar{X}\pm S_{\bar{X}}$	Cv%	$\bar{X}\pm S_{\bar{X}}$	Cv%
Live weight, kg		19.16±0.775	9.04	19.14±0.471	5.51	17.72±0.519	6.54
Carcass weight, kg		9.10±0.356	8.75	8.10±0.223	6.17	6.71±0.19	6.29
Slaughter yield, %		47.54±0.913	4.29	42.33±0.761	4.02	37.87±0.484	2.85
Commercial yield, %		54.42±0.541	2.22	51.68±0.708	3.06	47.42±0.429	2.02
Head	kg	0.79±0.031	8.66	0.89±0.021	5.40	0.86±0.016	4.28
	%	4.12±0.082	4.46	4.62±0.081	3.92	4.84±0.076	3.49
Organs	kg	0.842±0.047	12.55	0.907±0.056	13.78	0.84±0.06	16.35
	%	4.38±0.093	4.76	4.73±0.212	10.02	4.71±0.199	9.44
Full digestive tract	kg	4.39±0.439	22.402	5.21±0.208	8.93	5.37±0.187	7.78
	%	22.78±1.61	15.85	27.21±0.80	6.61	30.29±0.62	4.59
Empty digestive tract	kg	1.53±0.057	8.29	1.91±0.040	4.73	1.69±0.178	23.40
	%	8.02±0.191	5.33	10.02±0.206	4.60	9.55±0.89	20.83
Hide	kg	2.23±0.099	9.95	2.07±0.05	5.52	2.11±0.120	12.72
	%	11.62±0.283	5.45	10.63±0.46	9.63	11.91±0.43	8.09
Legs	kg	0.53±0.257	10.77	0.49±0.020	9.10	0.458±0.010	5.02
	%	2.79±0.113	9.13	2.56±0.06	4.94	2.59±0.05	4.42
Losses	kg	1.28± 0.447	34.92	1.52±0.126	18.61	1.37±0.127	9.26
	%	6.76±1.062	35.14	7.91±0.505	14.27	7.78±0.346	9.95

Carcass classification

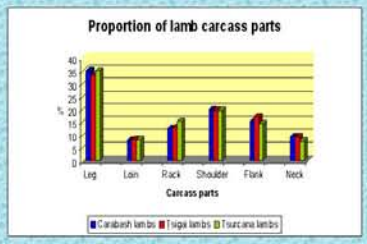
Breed	Category	Carcass weight (kg)	Quality	Meat colour	Fattening stage
Carabash	B, 7.1-10.0	7.6 – 9.4	1	Pink	Medium, fat
Tsigai	B, 7.1-10.0	7.5 – 8.3	1	Pink	Medium
Tsurcana	A, ≤7.0	5.8 – 6.8	1	Pink	Lean

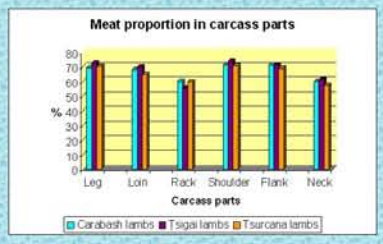
Meat to bone ratio

	Carabash lambs	Tsigai lambs	Tsurcana lambs
Meat to bone ratio	2.10 : 1	2.24 : 1	2.03 : 1

Carcass measurements (cm)

	Carabash lambs		Tsigai lambs		Tsurcana lambs	
	$\bar{X}\pm S_{\bar{X}}$	Cv%	$\bar{X}\pm S_{\bar{X}}$	Cv%	$\bar{X}\pm S_{\bar{X}}$	Cv %
Large trunk length	64.40±1.249	4.34	60.60±1.077	3.97	62.20±0.489	1.76
Small trunk length	51.40±1.288	5.61	49.80±0.917	4.12	50.70±0.625	2.75
Inner length of the leg	28.90±0.458	3.55	28.60±0.291	2.28	28.90±0.481	3.72
Outer length of the leg	41.20±0.800	4.34	39.20±0.374	2.13	41.30±0.255	1.38
Carcass width at the leg	13.38±0.423	7.08	12.00±0.316	5.89	11.6±0.400	7.71
Thorax width	15.90±0.400	5.63	16.70±0.200	2.68	15.2±0.489	7.21
Breast width	14.00±0.316	5.05	13.20±0.255	4.32	12.40±0.245	4.42
Thorax depth	21.50±0.500	5.20	20.90±0.332	3.55	21.20±0.374	3.95





The index of carcass form, which reflects the harmony of carcass development, had the highest value in Carabash lambs, followed by Tsigai and Tsurcana lambs. The same ranking was for the index of leg form. The index of carcass uniformity increasingly better as it closes to 100, which can be observed in Carabash lambs. The carcass traits of Carabash lambs are better than the carcass traits from other breeds

In terms of chemical composition of the meat, Carabash lambs produced meat with the highest percentage of dry matter, 32.47%, followed by Tsigai, 30.53%, and Tsurcana, 29.87%. Meat protein level was highest in Tsigai lambs, 62.39%, followed by Carabash, 56.2%) and Tsurcana (50.82%) lambs. The highest proportion of fat was noticed in Carabash lambs, 35.07%, followed by Tsigai, 27.57%, and Tsurcana, 24.83%, lambs.

Conclusions

- The results show that Carabash lambs have higher weight gains than the lambs from the other breeds, they have carcass form closer to the conformation specific to the meat breeds and have the fattest meat. They produced medium fat to fat carcasses, although the slaughter age was the lowest.
- Tsurcana lambs are the latest ones as age, have the leanest carcasses, but the organoleptic traits of the meat were evaluated to be the best. Tsigai lambs rank in between the former two breeds for most of the analysed traits, except for the meat to bone ratio, where they rank the first.
- In conclusion, Carabash lambs are the best suited for the production of suckling lambs because they have higher weights at lambing, have higher weight gains during the nursing period, reaching a live weight of 19.16 kg in just 1½ months (49 days). After the lambs are weaned at 1.5-2 months, the ewes can be milked and the milk marketed, which increases the efficiency of sheep production.

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