The Potential for Meat Production of the Romanian Tsigai Sheep Breed

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Abstract
The current study was conducted in order to evaluate the potential for meat production of the Tsigai sheep, as maternal breed, when crossed with native Palas Meat Breed and imported specialised breeds for meat production, such as Suffolk and German Blackface. The article is a review in which up-to-date results on crossbreeding between the Tsigai sheep and meat sire breeds are being presented. The results were obtained by different authors between 1976 and 2016. The results are presented based on the applied fattening technology and the genotype structure of the lambs. The growth rates and the quality of the meat and of resulting carcasses were superior in all cases in the intensive fattening systems in the crossbred lambs, compared to the Romanian local Tsigai breed.

Keywords: German Blackface, Palas Meat Breed, Suffolk, sheep, Tsigai

1. Introduction

Romania has 9.8 million sheep, currently ranks third in the EU in terms of sheep number after the United Kingdom and Spain [1], the number of sheep increasing by 6.81% compared to 2010. The Tsigai sheep is the second most important sheep breed in Romania with 24.3 % of the national sheep herds (the first is the Turcana sheep with 52.4 %). Tsigai breeds are kept extensively in mountainous and sub-mountainous regions with large pasture areas. Tsigai sheep is a multi-purpose breed with focus on cheese production.
Because the Tsigai sheep is a rustic breed, over time research attempted to improve milk and meat production, most work was based on the use of industrial crossings with specialized imported breeds.
Research conducted in Romania to improve meat production was focused on increasing prolificacy, improving aptitudes for meat production and carcass quality.
Imported specialized breeds to improve meat production were: Suffolk, Ile de France, Merinofleisch, German Blackface. The obtained results were in all cases higher than those obtained from Tsigai breed [2-5], but under the potential of improved breeds (for lamb meat).
Lamb production has become of more interest in the last years due export opportunities in the EU. In the period 1994-2013 (20 years), Romania was ranked first place in Europe regarding live animals exported for slaughter. In 2004 the maximum number of exported animals exceeded two million [5]. Over 97 % of the volume of exports is made

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up of young sheep of the Turcana breed and the difference of 3 % is comprised of young sheep of the Tsigai breed [6]. The main destination of these exports is the West European countries (Italy, Spain), and Muslim countries (Saudi Arabia, Libya) [7].

The current study assesses the potential for meat production of Tsigai sheep breed, based on crossbreeding between the Tsigai sheep and meat sire breeds, and on applied fattening technology [8, 9].

Table 1. Body weight evolution, total and daily gain, and specific consumption of young sheep fattened in different systems

Authors/ year	Geno type	Fattening period of time -days-	Body weight - kg		Gain		Specific consumption	
			Beginning of fattening	End of fattening	Total -kg-	Daily average -g-	Net energy ruminants, --kcal-	DP -g-
Pop A., et al., 1974, IAS Nima Dej(*	Tsigai	100	19.39 ± 0.37	37.99 ± 0.31	16.60 ± 0.28	202.49 ± 4.86	8857.90	628.22
	Suffolk x Tsigai	100	19.01 ± 0.47	40.55 ± 0.92	21.54 ± 0.46	227.99 ± 7.22	7938.15	554.26
Mireşan V., 1996, SDE Mănăştur(*	Tsigai	100	15.27 ± 0.20	37.64 ± 0.50	22.37 ± 0.33	223.75 ± 3.98	8037.20	877.60
Rău V., 1998 SCDCOC Reghin(*	Tsigai	100	16.20 ± 0.21	36.50 ± 0.89	20.30 ± 0.47	204.20 ± 5.10	8334.35	701.80
	German Black face x Tsigai	100	20.11 ± 0.21	48.70 ± 0.98	28.60 ± 0.35	276.30 ± 8.30	7358.00	636.20
Dărăban S., 2004 SCDP Jucu(**	Tsigai	150	21.62 ± 0.39	35.49 ± 0.11	13.87 ± 0.09	92.46 ± 2.15	15154.65	1124.10
Coroian C., 2006 SC Seradria Răscruci(*	Tsigai	100	15.14 ± 0.44	39.21 ± 0.75	24.07 ± 0.42	240.66 ± 23.50	8277.75	858.48
Ilişiu E., 2007 SCDCOC Reghin(*	Tsigai	100	16.61 ± 0.27	36.73 ± 0.16	20.12 ± 0.56	201.20 ± 19.67	8890.89	685.11
	German Black face x Tsigai	100	17.26 ± 0.37	39.88 ± 0.64	22.62 ± 0.27	226.20 ± 4.70	8126.71	624.94
	Suffolk x Tsigai	100	17.31 ± 0.22	41.14 ± 0.28	23.83 ± 0.67	238.25 ± 28.57	7520.54	523.18
Zamfir C., 2016 ICDCOC Palas(*	Tsigai	100	17.12 ± 0.43	32.24 ± 0.56	15.12 ± 0.21	151.2 ± 3.39	8679.36	866.70
	Palas Meat-Breed x Tsigai	100	15.54 ± 0.23	38.08 ± 0.59	22.54 ±0.55	225.4 ± 6.87	7031.94	727.59

(*intensive fattening, of 100 days; (** - pasture fattening, 150 days

2. Materials and methods

The biological material used in the experiments was composed from lambs of Tsigai breed and crossbreeds with local or imported meat breeds. In general, the experimental group were reared under intensive fattening for a period of 100 days, with one exception in which was applied fattening technologies on pasture during a 150-day period.
Having in mind the review character of this article, for detailing and deeply study of data interpretation, it's indicated to consult the basic works *in extenso* and bibliographic references, respectively.

Table 2. Slaughtering main indices and of carcasses quality in young ovine

from different genotypes, fattened in different systemsAuthors/ year	Genotype	Carcass weight -kg-	Slaughtering percentage -%-	Leg of mutton and chop from carcass -%-
Mireşan V.,1996, SDE Mănăştur	Tsigai	17.94 ± 0.45	47.70 ± 0.27	46.95 ± 1.18
Rău V., 1998 SCDCOC Reghin	Tsigai	17.08 ± 2.20	47.94 ± 2.05	46.45 ± 1.63
	German Blackface x Tsigai	23.90 ± 2.15	50.32 ± 2.18	50.41 ± 1.15
Dărăban S.,2004 SCDP Jucu	Tsigai	16.40 ±0.62	46.22 ±0.10	45.61 ± 0.04
Coroian C., 2006 SC Seradria Răscruci	Tsigai	17.92 ± 0.18	45.91 ± 0.18	47.88 ± 0.10
Ilişiu E., 2007 SCDCOC Reghin	Tsigai	16.95 ±0.41	46.06 ± 0.30	47.58 ± 0.38
	German Blackface x Tsigai	19.04 ±0.36	47.98 ± 0.22	50.22 ± 0.23
	Suffolk x Tsigai	19.80 ± 0.22	48.49 ± 0.29	50.88 ± 0.31
Zamfir C., 2016 ICDCOC Palas	Tsigai	13.84 ±0.38	42.92 ± 0.81	43.69 ± 0.95
	Palas Meat-Breed x Tsigai	17.96± 0.51	47.16 ± 0.91	46.95 ± 1.07

3. Results and discussion

Evolution of the body weight, total gain, daily average gain, and specific consumption are shown in Table 1.
Body weight at the beginning of fattening was between 15.14 kg in Tsigai breed at SC Seradria Răscruci and 21.62 kg in Tsigai breed at SCDP Jucu.
At the end of the fattening, the body weight was between 32.24 kg in Tsigai breed at ICDCOC Palas and 48.70 kg in crossbred German Blackface x Tsigai at SCDCOC Reghin. With regard to the total weight gain and the daily average gain, it was 92.46 g in Tsigai breed from SCDP Jucu, in pasture fattening conditions and 276.30 g in crossbreed German Blackface x Tigai at Reghin Station.
The experiment revealed that the total gain and average daily gain was higher in crossbred lamb compared to Tsigai lamb, and in intensive fattening compared to pasture fattening.
Slaughtering indices and of carcasses quality in young ovine are presented in Table 2.
Regarding slaughter yield, it should be noted that it had values between 47-50% to crossbred lamb, at a carcass weight from 17 to 23 kg, while in Tsigai breed, it had values between the 42-47% for a carcass weights from 13 to 17 kg.
The share of leg of mutton and the chop from carcass is easy above 50% in crossbred lamb with imported meat breeds, compared to the crossbred with the local meat breed.
It should be noted that, although there is a difference in carcass weight of only 1.08 kg between crossbred lamb from Palas Meat Breed,

and crossbred lamb from German Blackface, respectively 1.84 kg between crossbred from Palas Meat Breed and Suffolk, the share of the leg of mutton and chop in the carcass weight is only around 47% in the crossbred with Palas Meat Breed, while in the crossbred with imported breed, their value exceeds 50%. At the same time, in the Tsigai breed, the share of the leg of mutton and chop from carcass weight has values between 42-47%. It was highlighted, that the slaughtering indices and of carcasses quality is superior to crossbred with local and imported meat breeds, compared to the local pure breed.

The carcass classification (Table 3) shows the major effect of the genetic potential of the breed structure. From the point of view of carcass conformation, the carcass from crossbred lambs are included in U and R classes and those from Tsigai breed in R, O and P. Ranking in the R, O and P classes was made on the basis of the downgrading of the carcasses caused by the general insufficient development of the muscles, the anterior train having little obvious widths, and the posterior train a medium dressing and convexity [10-12]. Concerning the classification of carcasses after fat quality, high variability of fat repartition on and inside carcass was recoded in crossbred and Tsigai lambs.

Table 3. The classification of the young sheep carcasses according to the EUROP system

Specification	Score	Ilişiu E., 2007 (N = 5)			Dărăban S., 2004 (N = 10)		Coroian C., 2006 (N = 5)
		Tigaie	Suffolk x Tigaie	German Blackface x Tigaie	Tigaie Experimental	Tigaie Martor	Tigaie
I. Class after conformation	E	-	-	-	0	0	-
	U	-	3	-	0	0	-
	R	2	2	5	4	3	4
	O	3	-	-	6	6	1
	P	-	-	-	0	1	-
II. Class after the layer of fat	1	-	-	-	1	1	-
	2	-	3	-	5	4	3
	3	3	2	5	3	3	2
	4	2	-	-	1	2	-
	5	-	-	-	-	.	-

On a scale from 1 to 5, the carcasses from crossbred were included in 2 and 3 classes, and those from Tsigai breed in classes from 1 to 4. Carcass with such a high degree of variability come from lambs of the Tsigai breed. Carcasses included within the lowest class 1, obtained from Tsigai breed fattened on pastures, they are characterized by a low-fat quantity on and inside carcass.

4. Conclusions

The potential for meat production of Romanian Tsigai sheep breed depends on the fattening technologies applied.

Improving the carcass and meat quality can be achieved by crossing of Tsigai breed, as maternal genotype, with specialized sires for meat production.

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