

Morpho-Productive Characterization of Some Tzurcana Breed Populations, White Variety, Bred in Some Zones of Transylvania

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Abstract

The Tzurcana breed, a rustic breed with mixed morpho-productive character, named for good “the queen of mountains”, constitutes the main ovine breed exploited in Romania, being almost 90% from the total ovine livestock bred and exploited in our country. It presents great biodiversity both as color varieties and also as ecotype, the most spread one being white variety and for that reason in this article we propose to present a study on white variety bred in farms from Bistrița-Năsăud, Cluj, Satu Mare and Sălaj Counties. In the morpho-productive characterization we followed aspects concerning the body development and some body sizes, the wool production, the lambs’ number and milk production. In abstract, we refer to the body weight and we can say that comparing with the breed standard, in which in females it is between 35.00 and 45.00 kg, in our analyzed livestock this parameter varied between 57.12 and 66.00 kg, and in males was surpassed the standard with over 25 kg. This fact shows a tenacious work for breed massiveness increasing and other analyzed features improvement comparatively to the breed standard.

Key words: body weight, milk production, sheep, Tzurcana breed

1. Introduction

Favored by orographic conditions and cultivated by ancestral tradition, the ovine breeding has an important weight of Romanian animal husbandry sector, fact sustained during the time by the exploited stock, which had increasing and decreasing periods. Presently, according to data offered by EST at Newcronos, our country detains at European level a stock of 9,423 millions heads. The motivation for ovine breeding, besides those ones previously reminded is sustained also by other elements as the fact that is a traditional occupation; it represents a necessity that satisfy

subsistence; it is an economic source stable enough, and sometimes all these are sustained by a real passion. The passion in ovine breeding correlated with economic motivation is that one who lead in this animal husbandry sector to progress both quantitatively and also qualitatively and as well to breeders’ prosperity assurance.

From the total ovine stock bred in Romania a weight of about 65.00% is represented by the Tzurcana breed, considered as a rustic breed with a mixed morpho-productive character, milk-meat-rough wool-kids, with a great biodiversity given by color varieties and existent ecotypes [1].

As characterization of meat and milk production level of ovine species Romania is an important provider of lamb and ovine youth meat for the European market, fact sustained by over 1.60 millions exported heads in 2010, alive for

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slaughtering in the Europe countries, as well the ovine stock produces about 5.00% of world milk quantity and 24.00% of milk quantity produced at European level.

2. Materials and methods

The article purpose is that to put into evidence the level of some morpho-productive characters of some Tzurcana breed populations, white variety, exploited in farms from Satu-Mare, Sălaj, Cluj and Bistrița-Năsăud Counties. Entire studied stock has origins in the Sebeș-Alba ovine basin, therefore was done comparison with similar elements of ovine standard bred in that ovine basin.

The biological material subject of this study was represented by Tzurcana breed ovine, white variety, and the analyzed categories were: rams, mother-ewe, young rams, young ewes and lambs. There were determined the next features, which contribute to morpho-productive characterization of analyzed populations: body weight, wither height, bust width, thorax depth, croup width, body weight of lambs at birth and at weaning age, production of physically shorn wool, total milk production and as reproduction index – proliferation. The instruments used to determine the body sizes were scales, zoometer for small ruminants, compass, and to evaluate the milk production we used the ICAR method. The selected control method was A type method, A₄ control type, AT variant [2]. Besides quantitative production we also made the qualitative control determining percent content in fat and protein with help of an automatic line for milk analyze. The proliferation we expressed basis on lambs' production obtained from 100 lambing ewes. The lots were codified with the indicative of each County, thus we have **lot SM**, **lot SJ**, **lot CJ** and **lot BN**, and in each lot were studied 15 rams, 100 mother-ewes, 25 young rams, 25 young ewes and 100 lambs.

The crude data were statistically processed, and for comparison we used as witness lot the lot SM, knowing the fact that from Sebeș-Alba zone the Tzurcana ovine come through moving of flocks in the Satu-Mare zone, from where the new contoured ecotype was diffused in the Counties with breeding potential of Tzurcana from

Transylvania, we selecting the above reminded Counties, namely Cluj, Sălaj and Bistrița Năsăud.

3. Results and discussion

The body weight registered in ovine categories from the four exploitations taken in study is shown in table 1, as we mentioned the lot SM is considered witness and the other values are compared with average one of this lot. In the rams' case, the body weight values are situated between limits of 80.20 kg and 92.40 kg that express an average level of variability of this character in males. Also, comes out that lot BN registered a distinct significant value given to lot SM, due to directionally progressive rigorous selection practiced for this character. The difference registered between lot SJ and SM was of -8.00 kg, is also statistically insured for $p < 0.05$. Also in the case of other body sizes registered in rams comes out the superiority of lots BN and SJ given to lot SM, excepting the category of mother-ewes from lot SJ whose negative difference being statistically no-insured for $p > 0.05$. In case of lot CJ was registered the most reduced value of body weight in rams comparatively to all other lots, and given to lot SM this difference of 2.20 kg being statistically no-insured for $p > 0.05$.

The body weight in all analyzed categories, from all lots are superior to average cited by specialty literature for the Tzurcana breed ovine, white variety, from Sebeș-Alba basin, which in rams' case notifies body weights with average values comprised between 68.50 kg and 76.70 kg, these values being about 25 kg smaller than the value registered in lot BN and with 10-15 kg smaller than other lots [3]. In case of adult sheep, the value cited by Camalesa in 1975, Taftă V. in 1997 is situated between limits of 45.65 kg and 60.65 kg, while the values registered by us were situated between 57.12 kg and 66.14 kg, values superior in average with 15 kg.

In case of young ewes and rams the registered body weight in analyzed lots was over average cited by Camalesa in 1975 for the adult sheep, which expresses an emphasis of Tzurcana breed precocity, a rigorous selection practiced to improved this character in the same time with application of an optimized technology for youth breeding and exploitation.

Table 1. Body weight of studied ovine, kg

Category	Lot SM	Lot BN	Lot SJ	Lot CJ
rams	82.40 ± 1.32	92.40 ± 3.18 ⁺⁺	90.40 ± 2.78 ⁺	80.20 ± 1.28 ^{ns}
mother-ewes	60.00 ± 0.22	66.14 ± 0.27 ⁺⁺⁺	59.10 ± 1.17 ^{ns}	57.12 ± 1.04 [*]
young rams	64.10 ± 0.52	69.70 ± 0.82 ⁺⁺⁺	65.00 ± 1.26 ⁺	51.20 ± 0.47 ^{**}
young ewes	53.30 ± 0.17	59.38 ± 0.35 ⁺⁺	55.89 ± 0.95 ⁺⁺	48.42 ± 0.33 ^{**}

^{*} = positive differences; ⁺ = negative differences ; ns = P >0.05; ^{**}; ⁺⁺ = P <0.05; ^{***}; ⁺⁺⁺ = P <0.01 ; ^{****}; ⁺⁺⁺⁺ = P <0.001

Referring to the body weight of lambs at lambing time, presented in Table 2 as average between males and females, between lambs obtained in simple and twin lambing, there come out greater values registered at lambing in lambs from lot BN, namely 3.70 kg and the most reduced value in lambs from lot CJ of 3.10 kg. Comparatively to data cited in specialty literature depending on source, the value are more reduced with about one kilogram, if we compare with Camalesa 1975, or are similar to those ones presented by Pop A., 1983, Pădeanu I., 2002, Pascal C., 2007, and the

body weight registered in studied lots at weaning at 60 days was in average of 18.00 kg, which is characteristic for the belated weaning technology for this breed. The registered average daily gain correlated with a smaller value of body weight at lambing and with body weight at weaning, subsequently those one registered in young and adult animals, expresses the improvement of breed precocity degree, many authors presenting in their articles the apparition of a precocious Tzurcana in the last 20 years.

Table 2. Body weight and average daily gain of lambs from lambing to weaning, kg, g

Specification	Lot SM	Lot BN	Lot SJ	Lot CJ
at lambing	3.28 ± 0.71	3.70 ± 0.88 ^{ns}	3.39 ± 0.14 ^{ns}	3.10 ± 0.66 ^{ns}
at weaning – 60 days	19.01 ± 0.98	19.38 ± 0.31 ^{ns}	18.40 ± 0.87 [*]	17.70 ± 0.56 ⁺
total accumulation 0–60 days	15.52 ± 0.34	15.66 ± 0.16 ^{ns}	15.01 ± 0.56 ^{ns}	14.57 ± 0.42 ^{ns}
a.d.g. 0 – 60 days	258.81 ± 16.20	260.96 ± 11,18 ^{ns}	250.01 ± 4.58 ^{ns}	242.83 ± 2.59 [*]

^{*} = positive differences; ⁺ = negative differences ; ns = P >0.05; ^{**}; ⁺⁺ = P <0.05

The data concerning the value of determined body size withers height, trunk length, chest width,

thorax depth, croup width, for all ovine lots from analyzed material are presented in table 3.

Table 3. Body sizes of studied ovine, cm

	Size	Lot SM	Lot BN	Lot SJ	Lot CJ
rams	size at withers	78.20 ± 0.52	79.10 ± 0.44 ^{ns}	78.64 ± 0.22 ^{ns}	77.65 ± 0.26 ^{ns}
	trunk length	85.00 ± 0.45	85.70 ± 0.56 ^{ns}	85.10 ± 0.64 ^{ns}	84.80 ± 0.34 ^{ns}
	chest width	30.20 ± 0.41	31.12 ± 0.23 ^{ns}	30.83 ± 0.44 ^{ns}	29.66 ± 0.60 ^{ns}
	thorax depth	38.60 ± 0.28	39.56 ± 0.20 ^{ns}	39.01 ± 0.11 ^{ns}	37.19 ± 0.32 ^{ns}
	croup width	32.00 ± 0.32	32.96 ± 0.38 ^{ns}	32.10 ± 0.23 ^{ns}	30.95 ± 0.37 ^{ns}
ewes	size at withers	70.20 ± 0.57	71.93 ± 0.54 ^{ns}	70.80 ± 0.65 ^{ns}	69.89 ± 0.45 ^{ns}
	trunk length	70.01 ± 0.37	72.10 ± 0.34 ^{ns}	71.00 ± 0.26 ^{ns}	69.78 ± 0.33 ^{ns}
	chest width	24.10 ± 0.18	25.01 ± 0.11 ^{ns}	24.60 ± 0.10 ^{ns}	24.01 ± 0.22 ^{ns}
	thorax depth	34.10 ± 0.41	35.11 ± 0.44 ^{ns}	34.80 ± 0.40 ^{ns}	33.96 ± 0.39 ^{ns}
	croup width	24.10 ± 0.23	25.87 ± 0.21 ^{ns}	24.64 ± 0.19 ^{ns}	24.01 ± 0.46 ^{ns}
young rams	size at withers	74.05 ± 0.80	75.89 ± 0.68 ^{ns}	74.20 ± 0.88 ^{ns}	73.90 ± 0.76 ^{ns}
	trunk length	79.60 ± 0.33	81.55 ± 0.30 ^{ns}	79.80 ± 0.35 ^{ns}	79.10 ± 0.43 ^{ns}
	chest width	25.16 ± 0.24	26.50 ± 0.30 ^{ns}	25.40 ± 0.28 ^{ns}	25.00 ± 0.26 ^{ns}
	thorax depth	35.70 ± 0.09	37.01 ± 0.11 ^{ns}	35.80 ± 0.14 ^{ns}	35.66 ± 0.12 ^{ns}
	croup width	25.90 ± 0.34	27.65 ± 0.32 ^{ns}	26.00 ± 0.22 ^{ns}	25.57 ± 0.20 ^{ns}
young ewes	size at withers	65.18 ± 0.68	67.11 ± 0.71 ^{ns}	65.22 ± 0.65 ^{ns}	64.96 ± 0.56 ^{ns}
	trunk length	66.45 ± 0.56	68.05 ± 0.36 ^{ns}	66.98 ± 0.43 ^{ns}	65.95 ± 0.51 ^{ns}
	chest width	21.11 ± 0.34	23.10 ± 0.22 ^{ns}	21.33 ± 0.27 ^{ns}	20.89 ± 0.23 ^{ns}
	thorax depth	31.03 ± 0.30	32.98 ± 0.42 ^{ns}	31.33 ± 0.35 ^{ns}	31.00 ± 0.38 ^{ns}
	croup width	20.10 ± 0.26	21.87 ± 0.19 ^{ns}	20.78 ± 0.21 ^{ns}	19.96 ± 0.22 ^{ns}

ns = P >0.05

The average values registered for these sizes in lots BN, SJ and CJ compared with those ones of lot SM are statistically no-insured, $p > 0.05$, even there are differences for these sizing characters in the studied ovine populations. Comparatively to origin populations of studied lots from Sebeş-Alba basin, for which literature cites more reduced values at size level, for example 66.80 cm, trunk length of 69.90 cm [3], the values registered by us are more greater, in case of size at withers having an average of 78.00 cm or in case of trunk length an average of 85.00 cm. These values are correlated with the body weight and permit us to affirm that Tzurcana breed suffered an ample massiveness process to express more pronounced

the depths and widths, maintaining an ensemble harmony and robustness emphasis.

The wool production, table 4, that even economic point of view do not present interest, however among the breeders is an important selection criteria as concerns quantity and quality, the quantity increasing as result of animal massiveness, of extending emphasis and wool strand length increasing. Those ones affirmed by us are sustained by the values registered in all studied categories, exceptionally pointing out the production in rams that varies between 6.24 and 8.64 kg, knowing that the breed standard notifies for rams an average production of 4.50 kg [1, 3, 4, 5].

Table 4. Wool production of studied ovine, kg

Category	Lot SM	Lot BN	Lot SJ	Lot CJ
rams	7.80 ± 0.22	8.64 ± 0.27 ⁺	7.64 ± 0.56 ^{ns}	6.24 ± 0.17 [*]
mother-ewe	4.10 ± 0.30	4.84 ± 0.02 ^{ns}	4.14 ± 0.16 ^{ns}	4.10 ± 0.34 ^{ns}
young rams	6.20 ± 0.28	6.27 ± 0.05 ^{ns}	5.27 ± 0.10 ^{ns}	5.04 ± 0.07 [*]
young ewes	3.10 ± 0.09	3.96 ± 0.03 ⁺	3.70 ± 0.11 ^{ns}	3.04 ± 0.05 ^{ns}

^{*} = positive differences; ⁺ = negative differences ; ns = P > 0.05; ^{*,+} = P < 0.05

From the milk production potential point of view the breeds are classified in specialized breeds, good producer breeds, breeds with average production and ovine breeds with decreased potential for this production [1, 6]. For this reason the Tzurcana breed is situated in the second group, being characterized by an average total milk production between 100 and 120 l [1, 6]. The total milk production level registered in the lots of our

study is situated between 139.11 l in case of lot CJ and 185.43 l for the lot BN, these values being much superior to the average value of milk production according to breed standard. The average value differences of quantitative milk production between lot SM and lots CJ and SM are significant, ^{*,+} = P < 0.05, and statistically no-insured for comparison with lot SM, ns = P > 0.05.

Table 5. Quantitative and qualitative milk production - kg, %

Specification	Lot SM	Lot BN	Lot SJ	Lot CJ
milk production	165.65 ± 3.68	185.43 ± 3.98 ⁺	169.57 ± 3.38 ^{ns}	139.11 ± 4.30 [*]
% of fat	7.19 ± 0.11	6.88 ± 0.20 ^{ns}	6.90 ± 0.16 ^{ns}	7.01 ± 0.17 ^{ns}
% of protein	4.75 ± 0.18	4.46 ± 0.17 ^{ns}	4.57 ± 0.14 ^{ns}	4.71 ± 0.12 ^{ns}

^{*} = positive differences; ⁺ = negative differences ; ns = P > 0.05; ^{*,+} = P < 0.05

The qualitative milk production, expressed by fat and protein level, registered as average production during entire lactation in experimental lots is in the limits cited by specialty literature [7, 8], but the registered values are statistically no-insured between discussed lots. As level of quantitative milk production comes out the value of 185.43 l registered in lot BN, a production level close to minimum level of 200 l of breeds specialized for milk production [9, 10].

The lambs' production in studied lots, expressed by proliferation, represents an important index both for increased selection level and also for improvement results, by creating a large selection

basis and for meat production, knowing that a great number of obtained and weaned lambs per reproduction ewe provide a great meat quantity per exploited female, thus concurring to obtain superior economic results. The specialty literature presents for Tzurcana breed, in general, an average proliferation level of 103 – 105% [3], and for a precocious type the values are greater, about 120% [3] or even 140% [5].

The data obtained by us concerning this feature (figure 1) are situated between the limits cited by specialty literature for the “precocious type” of Tzurcana breed, the values for lots SM, SJ and CJ being between 122.47 and 138.47 %, limits

situated over minimal level of 120%, and in lot BN the registered value of 140.45% is sensible

greater than that one cited as superior limit.

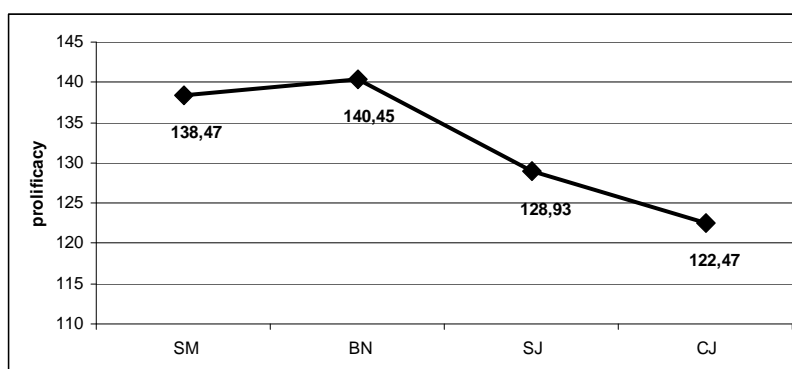


Figure 1. Value of proliferation index, %

4. Conclusions

The studied ovine populations present for appreciated characters superior values given to those ones registered in time for the ovine from which descend, namely those ones from Sebeș-Alba ovine basin, which means once again the necessity to practice a rigorous selection to obtain performance as action developed inside an optimal exploitation technology. It is worthy of appreciation the fact that the studied population from Bistrița-Năsăud County presents the greatest values for analyzed characters, with a pronounced homogeneity in the Tzurcana ewe stock, white variety bred in this zone. This fact is the result of a selection work practiced with strictness by the breeders during over 30 years, so it is more frequently mentioned a new ecotype of Tzurcana breed, very appreciated by the sheep breeders, named “băla of Bistrița”.

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