

PHENOTYPIC CHARACTERIZATION AND MILK QUALITY VARIATION OF TWO TYPE TSIGAI SHEEP BREED

KÖNYVES TIBOR¹, IVANC ALEKSANDAR², KIRÁLY CSABA¹, MIŠĆEVIĆ BRANISLAV¹

¹ Megatrend University Belgrade Faculty of Biofarming Department of Animal Science and Nutrition

24300 Backa Topola, Marsala Tita 39. Serbia

wiwat36@hotmail.com

² State University of Novi Pazar, Department of Biomedical Sciences, 36300 Novi Pazar, Vuka Karadzica bb., Serbia

aivanc@np.ac.rs

ABSTRACT

In this study the phenotypic characterization and milk quality variation of two type Tsigai sheep breed, Cokan and Pivnicki are presented. The Cokan type mostly prevailing in Banat region (East part of Vojvodina), the Pivnicki could be located between river Tisa and Danube. The study was carried out on several sheep farms in Central-Backa region. From every flock, from each type 30 sheep were selected. Phenotypic characteristics of Pivnicki Tsigai type were: the average value of forehead spread 12.25 cm, height at withers 76.62 cm, body length 87.6 cm, bust size 102.87 cm and shinbone size 9.62 cm, and for the Cokan type the following values were determined: forehead spread 12.25 cm, height at withers 76.62 cm, body length 87.62 cm, bust size 102.87 cm and shinbone size 9.62 cm. The fat content in milk from Pivnicki type - 10.25%, was higher than that from Cokan type, 9.28%. In the case of all other milk substances lower average values were recorded in milk from Pivnicki Type. Significant differences ($P < 0.05$) were found in density, minerals, milk protein and freezing point values.

Keywords: Tsigai breed, phenotypic characterization, milk quality, Cokan, Pivnicki.

INTRODUCTION

Local sheep breeds have preserved and held up as unique genetic resource because of their better adaptability and unpretentious to the condition of breeding. On the other hand, including the local sheep breeds in breeding schemes as a basis to create new breeds and lines has accounted for object of researches (ALEXIEVA, 1979; NEDELICHEV AND STOJANOV, 2004). The *Tsigai* sheep is one of the oldest Southeast European sheep breed, used for milk, meat and wool production and is associated with local traditions and food culture. The breed might have originated from Turkey and subsequently spread to the Balkan region, Hungary, Slovakia, Czech Republic, Moldavia and Russia (RYDER, 1983). *Tsigai* sheep arrived in the former Yugoslavia in the 18th century, (OGRIZEK, 1948). During the 20th century, both officially recorded governmental and poorly documented private sheep sectors existed in the former Yugoslavia. In Serbia, the governmental farms raised purebred *Tsigai* sheep, which form the core of the current Old *Tsigai* type, (ĆINKULOV, 2008). ANTUNOVIĆ et al. (2011) determined the phenotypic characterization of Croatian Tsigai sheep in organic breeding. In Hungary KUKOVICS and JÁVOR (2002) investigated the Tsigai breed characteristics. The most prevalent Tsigai types in Central –Europe are described. The aim of this study was to present phenotypic characteristics and milk quality variation of two type Tsigai breed: the Cokan and the Pivnicki (Sombor) type.

MATERIAL AND METHOD

The study was carried out on several sheep farms in Central-Backa region. Nowadays the pure Tsigai breed is very rare in Vojvodina. The Cokan type mostly prevailing in Banat region (East part of Vojvodina), the Pivnicki could be located between river Tisa and Danube.

The production system of both type are based on seasonal use of communal flood basin pastures – from April to November. In winter period the sheeps are indoors. The use of Alfalfa hay, grass hay, corn silo, beet pulp, as well as the barley, oat and grits are traditional. The shepherds are mostly owner of the flocks, the manpower is familiar. The size of flocks approximately are between 50 – 350 head.

Measuring of phenotypic characteristics were carried out by using of Lidtyn stick and tape measure. From every flock, from each type 30 sheep were selected. The following measurements were recorded: forehead spread, height at withers, length of body, bust size and shinbone size. The milk quality analysis was made by LACTOSCAN Milk analyser, Standard automat SA – Milkotronic Ltd. calibrated for sheep milk. As a material for milk examination we have taken ewes at different ages, different lactation, in period of march – april – may. The obtained results were analysed statistically using the “Microstat” statistical software package programme by Ecosoft Inc.

RESULTS AND DISCUSSION

The measurement results of different Tsigai types are presented in next tables. Table 1. shows the exterior characteristics of Pivnicki type.

Table 1. Measured exterior characteristics (cm) of Pivnicki type

Exterior characteristics/cm	Min.	Mean \pm SD	Max.
Forehead spread	10	12.25 \pm 1.67	15
Height at withers	70	76.62 \pm 4.47	84
Length of body	80	87.62 \pm 9.13	103
Bust size	96	102.87 \pm 4.55	110
Shinbone size	9	9.62 \pm 0.52	10

It was observed that the average value and standard deviation of forehead spread was 12.25 \pm 1.67, height at withers 76.62 \pm 4.47, length of body 87.62 \pm 9.13, bust size 102.87 \pm 4.55 and shinbone size 9.62 \pm 0.52 cm.

Table 2. present the measurement results of Cokan type. The results indicate that mean and standard deviation of exterior chracteristics were for forehead spread 12.25 \pm 1.67, height at withers 76.62 \pm 4.47, length of body 87.62 \pm 9.13, bust size 102.87 \pm 4.55 and shinbone size 9.62 \pm 0.52 cm.

Table 2. Measured exterior characteristics (cm) of Cokan type

Exterior characteristics/cm	Min.	Mean \pm SD	Max.
Forehead spread	13	13.75 \pm 0.87	15
Height at withers	65	71.50 \pm 5.93	84
Length of body	71	74.86 \pm 2.54	78
Bust size	97	112.12 \pm 8.15	123
Shinbone size	8	8.50 \pm 0.53	9

It was reported that average value of height at withers for Tsigai ewes and hoggets was in range of 67 – 75 cm, (BALIĆ, 2010). Different values were recorded by ANTUNOVIĆ et al. (2011), in organic breeding. Means of phenotypic characteristics were as follows: height at withers 81.20±0.81cm, body length 91.21±0.82 cm and bust size 111.67±0.96.

Varying records of exterior characteristics in neighboring countries were described by several authors, (GASPARDY et al., 2001; ĆINKULOV et al., 2003; JOITOIU, 2004; POPOVICI, 1954 and NIKOLIĆ, 1937.).

The average values for the milk composition in different Tsigai breed milk are listed in the table 3. Considering the milk components of examined milk samples the fat content in Pivnicki type - 10.25 %, was higher than these from Cokan type, 9.28 %. At the same time in the case of other milk substances lower average values were recorded in Pivnicki Type, as follows: non fat dry matter 9.3 %, lactose 5.36 %. Significant differences ($P < 0.05$) were found in density, minerals, milk protein and freezing point values. Compared to our results milk fat and lactose content achieved in our experiment (9.28, 5.58 %) were higher than that established by ALEKSIEV (2011), (5.74 and 5.38 %) in morning and afternoon milk.

Table 3. The milk composition of Cokan and Pivnicki Tsigai breed

Milk quality	Cokan	Pivnicki
	Mean ±SE	Mean ±SE
Fat (%)	9.28±0.34	10.25±0.52
Non fat dry matter (%)	9.54±0.08	9.30±0.35
Density (%)	28.97±0.74 ^a	26.52±0.78 ^b
Lactose (%)	5.58±0.04	5.36±0.14
Minerals (%)	0.91±0.01 ^a	0.87±0.02 ^b
Protein (%)	3.00±0.04 ^a	2.76±0.08 ^b
Freezing point °C	- 0.74±0.01 ^a	- 0.66±0.01 ^b

Mean values of the same parameter with different letters in superscript are significantly different ($p < 0.05$)

Similar lower values for milk fat percentage were described by SPÁNIK et al. (1996), 8.72%, by MARGHETÍN et al. (1998), 8.70%, and ORAVCOVÁ et al. (2005), 8.0%. The same authors found higher protein content: 5.97, 5.70 and 6.0%. Comparing the milk components variability from Hungarian Tsigai ewes CSANÁDI et al. (2006) concluded average values for milk fat: 7.05%, non fat dry matter: 11.27%, lactose 4.81%, minerals: 0.97% and protein: 5.49%.

CONCLUSION

Based on research carried out on two type of Tsigai sheep breed the following conclusions could be made:

Determined were phenotypic characteristics of different Tsigai types: for the Pivnicki type It was observed that the average value of forehead spread was 12.25 cm, height at withers 76.62 cm, length of body 87.6 cccm, bust size 102.87 cm and shinbone size 9.62 cm.

For the Cokan type the average values were: for forehead spread 12.25 cm, height at withers 76.62 cm, length of body 87.62 cm, bust size 102.87 cm and shinbone size 9.62 cm.

The fat content in milk from Pivnicki type, 10.2 5%, was higher than that from Cokan type, 9.28 %.

In the case of all others milk substances lower average values were recorded in milk from Pivnicki Type.

Significant differences ($P < 0.05$) were found in density, minerals, milk protein and freezing point values.

ACKNOWLEDGEMENTS

This paper was supported by the Ministry of Science and Technology of the Republic of Serbia under project TR 31031 " Improvement sustainability and competitiveness in the organic crop and livestock production using new technologies and inputs.

REFERENCES

- ALEKSIEV, Y. (2011): The effect of spring shearing on milk yield and milk composition in Tsigai ewes. *Biotechnology in Animal Husbandry* 27 (2), p 241-249 ,
- ALEXIEVA, S. (1979): Comparative Characterization of Some Local Sheep Breed in Bulgaria with Connection of Preservation of Genetic Resources in the Sheep Breeding. Thesis, Sofia.
- ANTUNOVIĆ Z., NOVOSELEC J., STEINER, Z., SAMAC, D. (2011): Fenotipske odlike cigaje u ekološkom uzgoju Proceedings. of 46th Croatian and 6th International Symposium on Agriculture. Opatija. Croatia (p.823-827)
- BALIĆ, S. (2010): Eksterijerne odlike cigaje. Završni rad. Poljoprivredni fakultet Sveučilišta J. J. Strossmayera u Osijeku, str. 29.
- CINKULOV, M., TAPIO, M., OZEROV, M., KISELYOVA, T., MARZANOV, N., PIHLER I., OLSAKER I., VEGARA, M., KANTANEN, J. (2008): Genetic differentiation between the Old and New types of *Serbian Tsigai* sheep *Genet. Sel. Evol.* 40 p. 321–331
- ČINKULOV, M., KRAJINOVIC, M., PIHLER, I.: (2003): Phenotypic differences between two types of Tsigai breed of sheep. *Lucrari stiintifice Zootehnie si Biotehnologii*, vol. XXXVI, Timisoara, Rumunija, *Lucr. St. Zoot. Biot. Timisoara*, XXXVI: p.295-299.
- CSANÁDI, J., FENYVESSY, J., BAJÚSZ, I. (2006): Cigája anyajuhok tejtermelésének és a tej összetételének vizsgálata. X. Agrárökönómiai Tudományos Napok. Gyöngyös. Full text in Conference CD p. 1-6. ISBN 963 229 623 0.
- GASPARDY, A., ESZES, F., BODO, I., KOPPANY, G., KESZTHELYI, T., MARTON, F. (2001): A cigája (berke) juh fajta hazai változatainak alkattani összehasonlító vizsgálata. *Állattenyésztés és Takarmányozás* 50 (1): 33-42.
- JOITOIU, R. (2004): Cercetari asupra oilor carabase din Teleorman. Disertacija.
- KUKOVICS, S., JÁVOR, A. (2002): A cigája fajta és jövője. (The Tsigai breed and its future) In JÁVOR A., MIHÓK S. (Eds.), *Génmegőrzés: Kutatási eredmények régi háziállatfajták értékeiről*. Debreceni Agrártudományi Centrum, Debrecen. Pp. 103-145.
- MARGETIN, M., HLAVATY, Š., PŘIBYL, J. (1998): Effect of genetic and non-genetic factors on milk composition in ewes of Improved Valachin and Tsigai breeds. *J. Farm Anim. Sci.*, XXXI, 29–36.
- NEDELICHEV, D., STOYANOV, B. (2004): Breeding Program for Karakachan Sheep. Breeding Association of Local Breeds in Bulgaria. Bioselena. Foundation for Organic Agriculture, p. 58-85.
- NIKOLIĆ, D. (1937): Prilog poznavanju cigaja ovce. Disertacija. Beograd.
- OGRIZEK, A., (1948): *Ovčarstvo*, Poljoprivredni nakladni zavod, Zagreb, Croatia.
- ORAVCOVA, M., GROENEVELD, E., KOVAČ, M., PEŠKOVIČOVA, D., MARGETIN, M. (2005): Estimation of genetic and environmental parameters of milk production traits in Slovak purebred sheep using test-day model. *Small Rumin. Res.*, 56, 113–120.
- POPOVICI, S. (1954): Contributii la cunoasterea oilor Tsiagi buculai din partea de vest a Banatului. *Prob. Zoot. Vet.* 11:29-36.
- RAYDER, M.L. (1983): *Sheep and man*, London: Duckworth.
- ŠPANIK, J., KAČINCOVA, A., MARGETIN, M., ČAPISTRAK, A., KALIŠ, M. (1996): Dependence of sheep milk quality on somatic cell counts. *Farm Anim. Sci.*, 29, 111–116.