

## The influence of lactation on SCC and TNG of the donkey milk

Zamfir Marchiș, Octavian Negrea, Aurel Stan, Aurelia Coroian, Cristian O. Coroian

University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Faculty of Animal Science and Biotechnology, Cluj-Napoca, Romania; Corresponding authors: Aurelia C., coroiان.aurelia@gmail.com; C. O. Coroian, coroiان.cristian@gmail.com

**Abstract.** Donkey milk due to its nutritional properties brings multiple benefits to consumer's health. TNG and SCC determine the quality of donkey milk and milk products. The quantity and quality of donkey milk is influenced by lactation number, similar to other species. The highest level for TNG and SCC was recorded in lactation 3 and 4 and the lowest concentrations in the first two lactations. TNG and SCC average values were classified below the limits established by the current legislation.

**Key Words:** *Equus asinus*, lactation, milk properties, milk microbiological quality.

**Introduction.** Donkey (*Equus asinus*) belongs to the genus *Equus*, subgenus *Asinus*, the Equidae family. Donkey is an important genetic resource for food and agriculture and plays an essential role in bringing some incomes in lesser developed areas. It is widely used for agricultural work, pastoral activity, various leisure activities and for milk (<https://camel4all.wordpress.com>). Data on donkey's milk production are very poor compared with the data for horses. Compared with other species, the donkey is reared and maintained quite easily, because it is less sensitive than other animals. The donkey use some feed resources that other animals do not consume in restricted access areas like hills and mountains. In present in the equine milk production there is a trend in yield increasing and implementation of a proper management toward an intensive production system. The variability of milk production reported in the literature is influenced by a significant number of factors such as nutrition, individuality, genetic background, breeding, rearing management and exploitation (Salimei & Fantuz 2012; Mureșan & Marchiș 2004). Milk production of donkeys is between 1.5 and 2 L/day/capita, being influenced by the feed given, the season and the quality of the biological material (Stan 2015). The data in the literature show that donkey milk is a useful food in preventing diseases such as arteriosclerosis and has an ability to increase the immunity of the human body (Salimei & Fantuz 2012).

The aim of this study was to evaluate the influence of lactation on milk SCC (somatic cell counts) and TNG (total number of germs) content in donkeys.

**Material and Method.** The biological material is represented by a population of donkeys in Cluj county, city Băbuț. There were studied a number 5 individuals for each lactation. Ten milk samples were collected per animal and per lactation. To asses primiparous and multiparous, were harvested a total of 10 samples for the two categories. Assessment and analysis of SCC and TNG was performed to assess the microbiological quality of donkey milk. Milk samples were collected in sterile containers. It was used BactoScan FC and BRT screening device test to analyze TNG and SCC in donkey's milk.

**Results and Discussion.** Recent specialized literature increasingly focuses on studies of donkey milk. Production is mainly concerned with the use of donkey milk as food for sensitive consumers (Salimei & Fantuz 2012). Milk composition can suffer modifications both before and after milking. If changes occur within the mammary gland, is almost

certainly talking about a disease or a treatment based on antibiotics or other medicine (Rotaru & Ognean 1998).

The stage of lactation influences the SCC, which is increased in the period after calving (5-14 days), whether udder is infected or not. Later, during lactation there was a slight decrease in the number of cells. At the end of the lactation period will also be an increase in the number of cells due to the physical changes of the udder (Rota et al 1993).

Research on somatic cell counts were reported by (Syed et al 2009). The total number of the somatic cells and the total number of germs of donkey milk depending on lactation as is shown in Table 1.

Table 1  
Average values and variability for NCS and NTG donkey's milk according to lactation

Specification	SCC			TNG		
	$X \pm sx$	V%	min-max	$X \pm sx$	V%	min-max
L 1	279.12±16.2	15.02	210-320	60.81±5.48	20.21	46.91-80.17
L 2	294.01±16.10	12.16	250-350	30.17±2.52	18.30	25.19-40.1
L 3	330.15±9.08	6.03	318-370	40.66±3.51	18.70	33.06-50.03
L 4	357.91±9.60	6.08	320.17-360.02	83.18±4.10	11.34	66.03-91.16

SCC - total number of somatic cells, TNG - total number of germs, L – lactation.

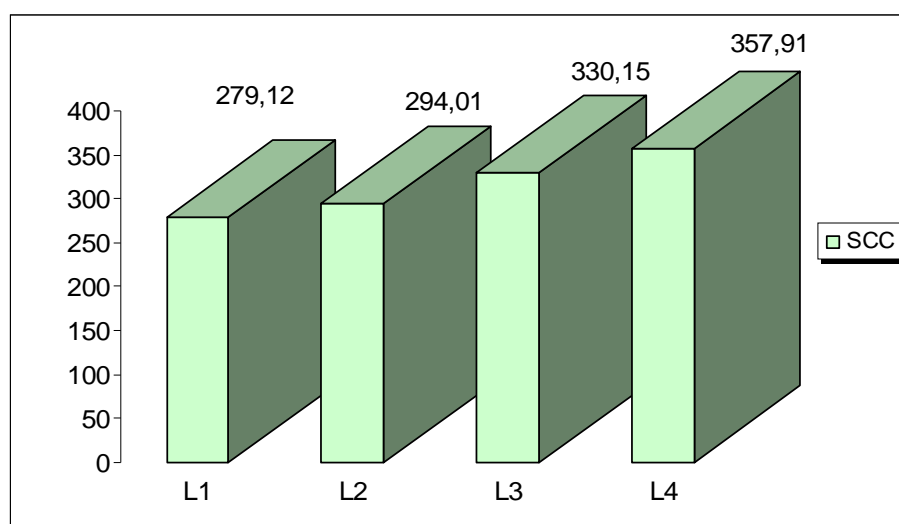


Figure 1. Average SCC values of donkey milk according to lactation.

Figure 1 shows the average values for SCC milk from donkeys during four lactations. Results show that the analyzed milk in terms of SCC is in accordance with the legal standards. These values increase with lactation, reaching the highest pick in lactation 4. Compliance by farmers and good hygiene practice leads to reduced SCC and TNG. Significant changes in milk composition can be recorded only when SCC exceeds the limit of legal standards (Król et al 2010).

Bartlett et al (1990) reported an increase in the number of SCC under the influence of age and lactation but also because of previous infection. Mastitis and SCC produce a decrease in content of lactose and milk fat (Harmon 1994).

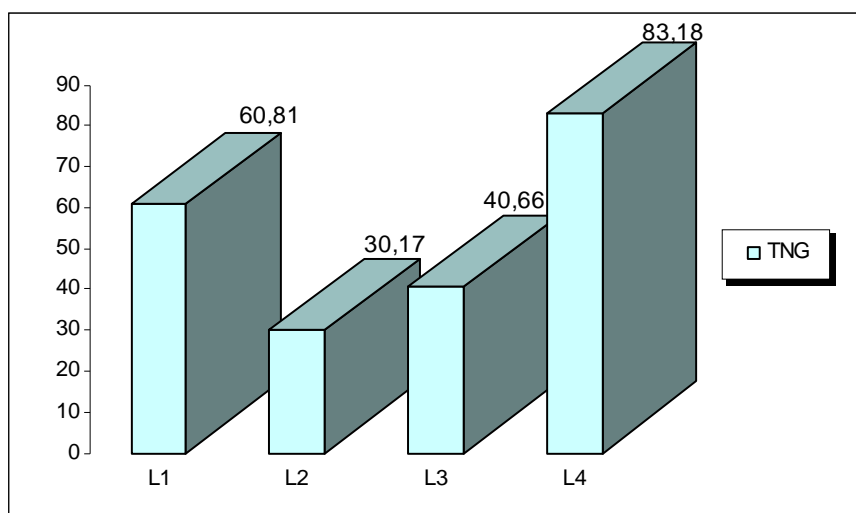


Figure 2. Average TNG values of donkey milk according to lactation.

NTG average values of donkey milk, as SCC are higher in lactation 4. All samples analyzed were within the limits set by European legislation on TNG (Council Directive 92/46/EEC). Figure 2 shows the average values for NTG donkey milk for the analyzed 4 lactations.

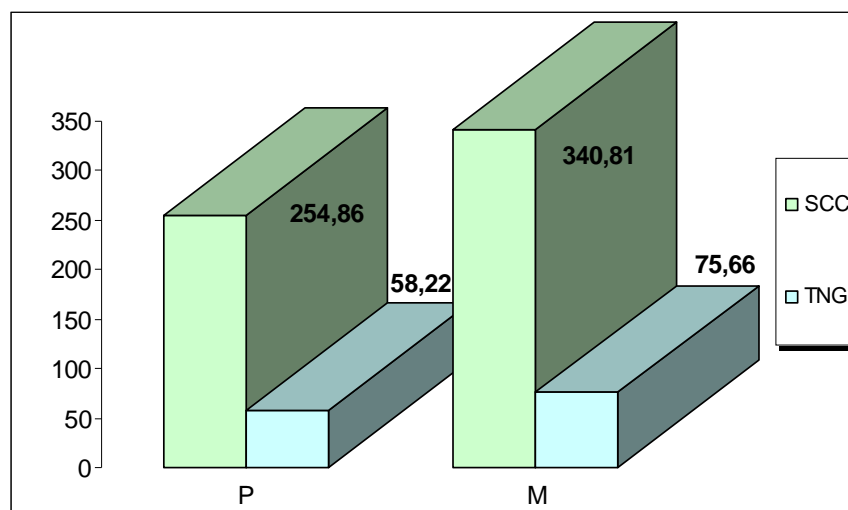


Figure 3. Mean values for SCC and TNG of donkey milk from primiparous and multiparous individuals (P - primiparous; M - multiparous).

From Figure 3 it can be seen that the multiparous donkeys showed a higher microbial load (SCC and TNG respectively). The recorded SCC average value for multiparous individuals was  $340.81 \pm 7.16$  and  $254.86 \pm 8.21$  for the primiparous.

TNG had similar appearance to the analyzed samples from donkeys primiparous or multiparous  $58.22 \pm 10.11$  and  $75.66 \pm 9.32$  respectively. These values are within the limits that are set by legal regulations on microbiological quality of the milk in terms of TNG and SCC (Council Directive 92/46/EEC). The quality of donkey milk after milking is determined according to the TNG, SCC and physico-chemical components (fat, protein, water, acidity, pH) (Coroian & Coroian 2009).

The health of the donkey and the udder has significant influence on the quantity and quality of donkeys milk yield. SCC and TNG are influenced by the following factors: lactation, age, stress, season, donkeys milking hygiene. TNG and SCC are indicators for

assessing the quality of donkey milk and mammary gland, and also provide information on the health of the flock.

**Conclusions.** In our country the donkey must be maintained to preserve biodiversity and for preservation of cultural values. This species is neglected because there are no programs of support for maintaining the species. This species number has highly decreased. On the Romanian market there are no donkey milk products. In other countries they are firm specializing in certain cheeses, soaps and creams exclusively in donkey milk. From this study it can be concluded that lactation affects SCC and TNG. Younger donkeys in lactations 1 and 2 had a lower content of SCC and NTG against the lactations 3 and 4.

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Authors:

Zamfir Marchiș, University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnology, Romania, Cluj-Napoca, 400372, Calea Mănăștur Street, No. 3-5, e-mail: marchiszamfir@yahoo.com

Octavian Negrea, University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnology, Romania, Cluj-Napoca, 400372, Calea Mănăștur Street, No. 3-5, e-mail: octaviannegrea@yahoo.com

Aurel Stan, University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnology, Romania, Cluj-Napoca, 400372, Calea Mănăștur Street, No. 3-5, e-mail: aurelstan@yahoo.com

Aurelia Coroian, University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnology, Romania, Cluj-Napoca, 400372, Calea Mănăștur Street, No. 3-5, e-mail: coroian.aurelia@gmail.com

Cristian Ovidiu Coroian, University of Agricultural Sciences and Veterinary Medicine, Faculty of Animal Science and Biotechnology, Romania, Cluj-Napoca, 400372, Calea Mănăștur Street, No. 3-5, e-mail: coroian.cristian@gmail.com

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