

## COMPARATIVE ANALYSIS OF COMPLIANCE OF GENETIC POTENTIAL OF THE RACE FOR MILK PRODUCTION BREED OF GOATS ALPINA IN MUNICIPALITY OF STRUGA IN THE REPUBLIC OF MACEDONIA

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### ABSTRACT

Alpine race belongs to the most dairy breeds of goats, whose race genetic potential for milk production amounts to 900 liters per lactation, which lasts about 280 days.

The purpose of this research is to carry out a comparative analysis of the implementation of the race genetic potential for milk production in the Alpine breed reared in the municipality of Struga R. Macedonia. The survey was conducted in the municipality of Struga on a sample of 20 individual goat breeders of this race.

The smallest variation of the variation width ( $V\check{S} = (\text{Max}-\text{Min})$ ) in the sample ranges from 495 liters or 55 %, and the biggest variation of the variation width is 644 liters or 71.5 %.

The average deviation of the progress genetic potential for producing milk of goats of the Alpine breed in Municipality of Struga with extensive local technology compared to race genetic potential for milk production (which is 900 liters per lactation) variation of the variation width  $V\check{S}=(\text{Max}-\text{Min})$  is 571 liters or 63.4 %.

From the results, the sample of 20 goat breeders, which is chosen based on: the use of similar technology for accommodate goats, assistive technology equipment and tools, micro-climatic conditions, selection and improvement of the quality of the resulting offspring and nutrition, we can conclude that all breeders have derogation in fulfilling the genetic potential for milk production of goats of the Alpine breed in Struga in the ratio of the race genetic potential for milk production.

**Key words:** goat, alpine race, genetic potential, milk.

### Introduction

The production of milk and dairy products from goats are increasingly found application in nutrition at all ages of people, because of the great economic importance, which stems from many respected nutritional, dietary and medicinal properties of the products. Goat milk contains easy digestibility due to the small and fine fatty acids (linolenic and arachidonic acid), which enzymes of the digestive tract of man quickly and easily decompose (unlike cow's milk), casein is easily digestible and clot that forms in human stomach is much softer compared to milk from other animals. Also, goat milk contains calcium, phosphorus, smaller amounts of iron, lesser amounts of folate that is necessary for synthesis of hemoglobin, less vitamin C, E and B12 which are in the correct ratio and that goats hardly become infected by RNA viruses have good antiviral activity, it is recommended in the diet of children and sick persons (Popovski K, Stefanovska J., 2002).

Goat milk is suitable for manufacture of many kinds of quality cheese and yogurt, which from year to year the interest is growing. Diversity of cheeses is very large, as they usually are produced locally from farmers themselves. Therefore, cheeses are typical of the area and the region from which originate (Sutton J. D. & Mowlem A. 1991; Hetherington L. & Matthews G. J. 1999).

Alpine is a French breed of goats reared in the Alpine, created with the participation of the Swiss breeds. The animals are of medium size, strong and developed bone system and expressed the depth of the body. The head is without horns with slightly indented profile, the forehead is broad and has upright ears. Hairy coat is short and often with yellow-brown or black-brown with black legs and black dorsal line. Often you can meet and black goats. The average live weight of the goats is 60–70 kg, while at the male goats is 80–100 kg. Fertility of this breed ranges from 180–190 %.

The breed genetic potential for production of milk of this breed is up to 900 liters per lactation. In this breed of goat selection emphasis is on increasing the level of proteins, therefore characterized by higher levels of protein, because the milk of this breed are used to produce various types of cheeses (Franic I. 1993).

In The Republic of Macedonia, this race is so organized imported there are and reproduction centers aimed at improving the domestic goat population. In Struga and elsewhere in our country, there are a small number of professional, highly specialized goat farms. Breeding goats is usually combined with existing herds of sheep and the number of goats ranges from about 2–20 throats.

### Materials and Methods

In the survey was conducted comparative analysis of the results on a sample of 20 individual breeders of goats in order to determine how to meet racial genetic potential for milk production from goats of the Alpine breed, which is grown in the municipality of Struga. The results was obtained from purchase center for milk Struga IMB Bitola.

For the statistical analysis of the data we used variable width  $V\check{S} = (Max - Min)$  in the sample. Results are presented in tables and graphics.

### Results and Discussion

The survey was conducted with a comparative analysis of the results on a sample of 20 individual goat breeders to determine how to meet the racial genetic potential for milk production from goats of the Alpine breed, which is grown in the municipality of Struga.

The results are presented in Table 1 and Chart 1.

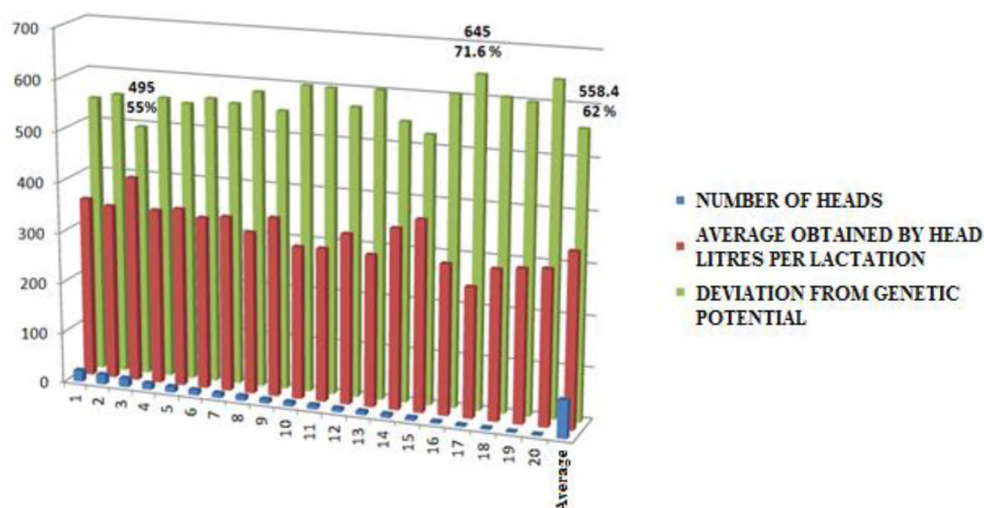
**Table 1: Comparative analysis of the results obtained for the racial genetic potential for milk production from goats of the Alpine breed, which is grown in the municipality of Struga (a representative sample of 20 breeders).**

| Breeders | Number of heads | Quantity of milk production per farm in lactation (litres) | Average obtained by head litres per lactation | Genetic potential by head litres per lactation | Deviation from genetic potential |      |
|----------|-----------------|------------------------------------------------------------|-----------------------------------------------|------------------------------------------------|----------------------------------|------|
|          |                 |                                                            |                                               |                                                | litres                           | %    |
| 1        | 22              | 7 810                                                      | 355                                           | 900                                            | 545                              | 60.5 |
| 2        | 19              | 6 555                                                      | 345                                           | 900                                            | 555                              | 61.6 |
| 3        | 17              | 6 885                                                      | 405                                           | 900                                            | 495                              | 55.0 |
| 4        | 12              | 4 140                                                      | 345                                           | 900                                            | 555                              | 61.6 |
| 5        | 11              | 3 872                                                      | 352                                           | 900                                            | 548                              | 60.8 |
| 6        | 10              | 3 390                                                      | 339                                           | 900                                            | 561                              | 62.3 |
| 7        | 9               | 3 105                                                      | 345                                           | 900                                            | 555                              | 61.6 |
| 8        | 9               | 2 871                                                      | 319                                           | 900                                            | 581                              | 64.5 |
| 9        | 8               | 2 816                                                      | 352                                           | 900                                            | 548                              | 60.8 |
| 10       | 8               | 2 400                                                      | 300                                           | 900                                            | 600                              | 66.6 |
| 11       | 8               | 2 408                                                      | 301                                           | 900                                            | 599                              | 66.5 |
| 12       | 7               | 2 338                                                      | 334                                           | 900                                            | 566                              | 62.8 |
| 13       | 7               | 2 086                                                      | 298                                           | 900                                            | 602                              | 66.9 |
| 14       | 7               | 2 478                                                      | 354                                           | 900                                            | 546                              | 60.6 |
| 15       | 6               | 2 250                                                      | 375                                           | 900                                            | 525                              | 58.3 |

| Breeders      | Number of heads | Quantity of milk production per farm in lactation (litres) | Average obtained by head litres per lactation | Genetic potential by head litres per lactation | Deviation from genetic potential |             |
|---------------|-----------------|------------------------------------------------------------|-----------------------------------------------|------------------------------------------------|----------------------------------|-------------|
|               |                 |                                                            |                                               |                                                | litres                           | %           |
| 16            | 4               | 1 180                                                      | 295                                           | 900                                            | 605                              | 67.2        |
| 17            | 3               | 765                                                        | 255                                           | 900                                            | 645                              | 71.6        |
| 18            | 3               | 882                                                        | 294                                           | 900                                            | 606                              | 67.3        |
| 19            | 2               | 600                                                        | 300                                           | 900                                            | 600                              | 66.6        |
| 20            | 2               | 608                                                        | 304                                           | 900                                            | 645                              | 71.6        |
| <b>Total:</b> | <b>74</b>       | <b>59 439</b>                                              | <b>341.6</b>                                  | <b>900</b>                                     | <b>558.4</b>                     | <b>62.0</b> |

$V\check{S} = (V\check{S} = (\text{Max} - \text{Min}) = 900 - 405 = 495 \text{ l or } 55 \%)$ ;  $V\check{S} = (\text{Max} - \text{Min}) = 900 - 255 = 645 \text{ l or } 71.6 \%$ ;

$V\check{S} = (\text{Max} - \text{Min}) = 900 - 341.6 = 558.4 \text{ or } 62 \%$



**Chart 1: Comparative analysis of the results obtained for the racial genetic potential for milk production from goats of the Alpine breed, which is grown in the municipality of Struga (sample of 20 breeders).**

The results, a sample of 20 goat breeders, which is chosen based on: the use of similar technology to accommodate goats, assistive technology equipment and tools, micro-climatic conditions, selection and improvement of the quality of the resulting progeny and diet can be concluded that in all breeders have derogation in fulfilling the genetic potential for milk production of goats of the Alpine breed, bred in Struga in the ratio of racial genetic potential for milk production.

The smallest variation, of the variational width  $V\check{S} = (\text{Max} - \text{Min})$  is the sample of 495 liters or 55 %, while the largest variation of the variational width amounts to 644 liters or 71.5 %.

The average deviation for the entire sample of the achieved genetic potential for the production of milk goats of the Alpine breed, bred in the municipality of Struga with local extensive technology compared to racial genetic potential of the milk production (which is 900 liters per lactation), varying varacionata width  $V\check{S} = (\text{Max} - \text{Min})$  is 558.4 liters or 62 %.

Similar results were obtained in studies conducted by the Ministry of Agriculture of the Republic of Macedonia, and published in the Strategy of improving and monitoring the quality of milk 2013–2020, the share of the population dairy goats which are covered in the survey, that is under the control of productive and reproductive traits. It was found a significant reduction in usability of genetic capacity of of heads as a result of the low level of primary education of the farmers, educating farmers and the secondary use of contemporary technologies in goat production (breeding, accommodation, care, selection, improving the quality of the resulting progeny and nutrition of heads

among the majority of the farms). Also in this study, the stated reasons are limiting factors in terms of improving the milk yield of heads, and improve the genetic capacity of heads.

### Conclusions

From the obtained results of a sample of 20 goat breeders, we can conclude that all have derogation in fulfilling racial genetic potential for milk production of the goats of the Alpine breed (which is 900 liters per lactation per head), grown in the municipality of Struga.

The smallest variation, of the variational width  $V\check{S} = (\text{Max}-\text{Min})$  is the sample of 495 liters or 55%, while the largest variation of the variational width amounts to 644 liters or 71.5 %.

The average deviation for the entire sample of the achieved genetic potential for the production of milk goats of the Alpine breed, bred in the municipality of Struga with local extensive technology compared to racial genetic potential of the milk production (which is 900 liters per lactation), varying variational width  $V\check{S} = (\text{Max}-\text{Min})$  is 558.4 liters or 62 %.

Farmers, breeders of goats from dairy breed Alpina grown in Struga, do not achieve the racial genetic potential for milk production, as a result of the low level of primary education of the farmers, educating farmers and the secondary use of contemporary technologies in goat production (breeding, accommodation, care, selection, improving the quality of the resulting progeny and nutrition of heads among the majority of the farms). Also in this study, the stated reasons are limiting factors in terms of improving the milk yield of heads, and improve the genetic capacity of heads.

The research we concluded that the National Extension Agency of the Republic of Macedonia, responsible for implementing the advisory component in their advisory programs, should plan to put greater emphasis on the development of goat breeding in the municipality of Struga and wider in our country, because the goat as a branch of animal husbandry, has great significance for the development of rural areas, rural tourism in the production of quality products.

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