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Influence of diet on the productivity and characteristics of goat milk

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ABSTRACT

The relationship between the quality of milk of different breeds of goat and their diets was assessed. German White and Alpine goats were used in the experiment, with 7 goats representing each breed. The diets *viz.*, a routine diet (hay and concentrates) and a diet improved by introduction of granulated alfalfa hay, carrots, as well as mixed feed on productivity and characteristics of goat milk were investigated. Goats milked twice daily and the quantity as well as quality of milk were investigated. In Alpine goats increased 3 times; and that of the German White goats increased 2 times. Feeding improved diet resulted in significant increase in fat content of milk irrespective of the goat breed. Increase in the protein, lactose, and consequentially the, dry non-fat milk solids was observed in Anglo-Nubian White goats when fed the improved diet. However, when compared to German White and Alpine goats, high and lactose contents were recorded in milk of Anglo-Nubian goats both on routine and improved diet. No difference in biochemical parameters of milk upon changing the diet was also found in Anglo-Nubian goats. Freezing point and electrical conductivity of the milk decreased irrespective of the breed when goats were fed the improved diet. An inverse relationship was found between the protein content in the goats' milk and the freezing point in the protein content, the freezing point was reduced.

Key words: Fat, Feeds, Milk yield, Somatic cells count, Total protein.

INTRODUCTION

Breeding of goats is one of the efficient lines of livestock farming in the world (Haenlein, 2001, 2004; Bernard *et al.*, 2009; Boyko, 2015; Boyko *et al.*, 2016). It provides people with valuable food products. With regard to Ukraine, dairy products obtained from goats are used only partially. However, consumer interest in goat milk and products made from it is growing year to year. Goat milk produced in the world is processed into cheese and other dairy products (Pulina *et al.*, 2006; Sanz Sampelayo *et al.*, 2007; Ollier *et al.*, 2009). The biochemical properties of milk (fat and protein concentration) and the somatic cells count are evaluated in terms of dependence of milk quality on the goats' diet (Pulina *et al.*, 2006). Length of feed (Beauchemin *et al.*, 1994), forage-to-concentrate ratio, and various additives: sunflower, linseed oils, olive cake (Beauchemin and Buchanan-Smith, 1989; Beauchemin, 1991; Kawas *et al.*, 1991; Bava *et al.*, 2001; Bernard *et al.*, 2005; Min *et al.*, 2005; Ollier *et al.*, 2009) have an effect on the quantity and quality of milk. Another important factor which influences milk productivity is the breed of goat. It has been established that fat content in the milk of Saanen goats is higher than in that of Alpine, but lower than in Nubian

goats' milk. The highest protein content is characteristic of milk of Nubian goats (Boichard *et al.*, 1989; Y

Since goats of various breeds differ by productivity and composition of milk, the overall evaluation of these animals for their task-oriented use in milk production. The German White is one of the most popular breeds in dairy goat breeding with it, Alpine, Nubian and German White goats are bred on some farms. Therefore, the objective of the present study was the evaluation of quality of Alpine, Anglo-Nubian and German White goat milk in relationship to the goat diet.

MATERIALS AND METHODS

The experiment was carried out on "Ukrainian" farm which is located in Dnipropetrovsk region (southern part of the steppe zone of Ukraine) and specialized in breeding 21 lactating Anglo-Nubian, German White and Alpine goats (7 animals of each breed) were used in the experiment. The goats were imported from Germany in the last 3 years, and they are kept in satisfactory conditions. In summer, the animals spend all day on the pasture while in the cold season they stay indoors. They have free access to feed and water. Milking is performed daily using a milking machine and churn. The

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