

Goat colostrum immunological quality: on-farm evaluation

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Goat dairy farms are often characterized by highly variable management practices and production systems. Kid mortality has not been identified as a priority issue in recent breeding programs, despite average losses of up to 30% in some regions. As one of the most important nutritional resources for newborn kids, colostrum plays a crucial role in their survival during the first hours of life. In recent years, several studies have been conducted on the use of rapid tools for assessing colostrum quality in order to intervene when necessary (Kessler et al., 2020; Pérez-Marín et al., 2023). The aim of the study is to analyse the animal factor affecting immunological goat colostrum quality. Additional goal is to evaluate results from two different analytical methods to quantify colostrum quality, such as gamma-globulin concentration (mg/mL) through protein electrophoresis and digital Brix refractometer (% Brix).

A total of 238 colostrum samples was collected from 9 Italian dairy farms. The 47.5% of the samples were from Alpine goats, 39.9% from Saanen and 12.6% from other breeds. The management systems were indoor or indoor with occasional use of pasture. Most of the samples were from 3 or more parity goats (40.4%), 20.2% from first parity and 39.4% from second parity. Colostrum samples came from goats with single kid (22.4%), 64.0% two kids and 13.7% 3+ kids. All data were analysed using SAS software (version 9.4). A regression procedure was used to evaluate the efficacy of the digital refractometer as a rapid tool for assessing the immunological quality of colostrum, obtaining a R-square of 0.603. From PROC Means procedure the average colostrum gamma-globulin concentration resulted 32.5 ± 24.5 mg/mL and the Brix from digital refractometer was 19.2 ± 6.86 ° Brix. These results are lower than the suggested threshold of 50 mg/ml or 22 ° Brix (Kessler et al., 2020), indicating problems linked to immunological colostrum quality in the farms included in the study. In some of the previous studies these quality levels were associated with better goat kid health status. Data found in the present study underline a high variability of the colostrum quality due to endogenous and exogenous factors. Log transformation for regression analysis between two measurements was performed. GLM analysis only for Alpine and Saanen data was done; the effects considered in the model: breed (A, S); farm (1-7), Parity (1, 2, 3+), number of kids (1, 2, 3+). All the effects significantly influenced colostrum quality, both as gamma-globulin and Brix (as log10). The best colostrum quality was found for Alpine goats, 3+ parity and animals with 2 kids.