



UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM  
TIMISOARA  
"YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH  
IN APPLIED LIFE SCIENCES"

21-22 November, 2024



"Young people and multidisciplinary  
research in applied life sciences"

## ASSESSMENT OF THE QUALITY OF COW COLOSTRUM OBTAINED IN THE FIRST DAYS AFTER CALVING

Ariton Adina-Mirela, Neculai-Văleanu Andra-Sabina, Borș Silviu-Ionuț, Poroșnicu Ioana, Vintilă Vasile

Research and Development Station for Cattle Breeding Dancu, Iasi - Ungheni Alley No. 9, Iasi, Romania

**Abstract:** For a newborn calf, colostrum is the first and most vital food. Colostrum has an increased proportion of components transferred directly from the mother's blood. A newborn calf's health, productivity, and longevity depend on the type and amount of colostrum they receive initially. By measuring the colostrum's physico-chemical components and refractive index on the Brix scale, the study sought to assess the colostrum's quality during the first five days following calving. The concentration of IgG in bovine colostrum was estimated with a portable and easy-to-use refractometer, and its concentration varied significantly from day two. According to the studies, IgG levels significantly dropped after calving, going from an average of 35 brix on the first day to 10 brix on the fifth. Although its components vary greatly, colostrum up until day five has a higher concentration of lipids, proteins, and dry matter—all of which are vital for the newborn.

### Introduction

- Compared to milk, colostrum contains more components transported directly from the mother's blood and around 60% protein in dry matter, with whey protein accounting for 80% and casein for 20% (Szulc, 2012).
- Because of the anatomy of the placenta, the foetus in the uterus does not get antibodies from its mother, leaving newborn calves susceptible to all infections in the environment.
- The quality of the first colostrum provided to a newborn calf is critical to its future health, production, and longevity.
- Passive immunity reduces the incidence of digestive and respiratory disorders and deaths in the first few months of birth (Ewa et al., 2024).

### Conclusions

- Physico-chemical parameters of colostrum have much lower values on the fifth day, except the lactose content, which varies inversely proportional to the fat, protein, dry matter, and casein content.
- Using a portable refractometer in bovine farms by veterinarians will facilitate correct and early decisions regarding the quality of the first colostrum administered to newborn calves.
- To enhance passive transfer and reduce calf illness and mortality, farmers must be made aware of the significance of storing and administering colostrum at the right times.

### Materials and methods

- The study was carried out on a lot of 25 dairy cows from the BNR breed, from which it was harvested 100 ml of colostrum in falcon tubes. Colostrum quality was monitored in the first 5 days after farrowing.
- Physico-chemical parameters of the colostrum were determined with the Combiscope automatic analyzer. IgG concentration was measured with a portable refractometer, and colostrum density was determined with a colostrometer.



Figure 1. Illustration Refractometer

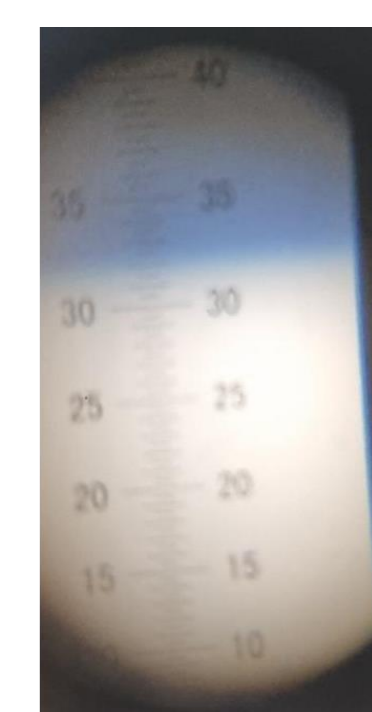


Figure 2. Illustration Colostrometer

Table 1. Evaluation of the quality of bovine colostrum

| NR. CRT. | VALUES BRIX % | CONCENTRATION IGG (G/L) | QUALITY    |
|----------|---------------|-------------------------|------------|
| 1.       | < 18-20       | 0-25                    | Low        |
| 2.       | 22-25         | 50 - 75                 | Good       |
| 3.       | 27 - >29      | 100 - >125              | Excellence |

### Results and discussions

- According to study, the immunological value of colostrum as measured by the Brix scale levels after calving decreased from an average of 35 brix on the first day to 10 brix on the fifth.
- Colostrum until day five contains a higher concentration of lipids, proteins, and dry matter—all of which are essential for the newborn.

Table 2. Average values of bovine colostrum components analyzed in the first 5 days after calving

| Days  | IgG conc. on the Brix scale, % | SCC x10 <sup>3</sup> cells/mL | Fat % | Protein % | Solids % | Lactose % | Casein % |
|-------|--------------------------------|-------------------------------|-------|-----------|----------|-----------|----------|
| Day1  | 35                             | 7 662                         | 8.89  | 12.55     | 26.41    | 3.09      | 10       |
| Day 2 | 21                             | 2 244                         | 5.74  | 4.03      | 14.72    | 3.93      | 5.99     |
| Day 3 | 12                             | 171                           | 5.90  | 3.88      | 14.68    | 4.42      | 3.87     |
| Day 4 | 10                             | 159                           | 4.27  | 3.86      | 13.53    | 4.26      | 3.05     |
| Day 5 | 10                             | 79                            | 4.08  | 3.75      | 13.22    | 4.16      | 3.03     |