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# Colostrum management practices in some Romanian dairy farms

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## **Abstract**

*When calves are born they have no innate immunity so consumption of an adequate volume of high-quality colostrum in the first hours of life is vital to a dairy calf's ability to survive and become a productive herd member. Colostrum handling and feeding are essential management protocols for dairy producers. The aims of this study were to investigate current colostrum management practices in Romanian dairy farms using a questionnaire-based that was sent to 30 dairy veterinarians from all over the country between March and June 2019. The questionnaire objective was to describe colostrum management practices carried out in Romanian dairy farms and to identify weaknesses in these areas that may affect calf health and welfare by comparing the results with the current industry recommendations. The way colostrum is managed and fed to calves has changed a lot in recent years in Romania. More operations are removing calves from their dams immediately after birth (83,3%), which decreases the risk of direct disease transmission. Colostrum quality is being evaluated on a higher percentage of operations (63,3%), but the passive transfer of immunoglobulins into the blood of cattle is still tested in a few cases (26,7%). Knowing all these current colostrum practices on our dairy farms help us to identify the possible mistakes that are made and to find solutions to improve the management of colostrum and reducing the morbidity and mortality rates of newborn calves.*

**Key words:** calf, colostrum, dairy farm, management.

## **Introduction**

Colostrum quality plays a vital role in calf health. Colostrum feeding is a critical part of raising healthy calves and to provide it cows must produce adequate amounts of colostrum with high concentrations of immunoglobulins, cytokines, nutritional elements, and growth factors (McGuirk and Collins, 2004). High-quality colostrum has adequate concentrations of immunoglobulin and is free of pathogens. To achieve successful passive transfer of immunity (>10mg of IgG/ml of serum; Godden, 2008), it has been suggested that a calf needs to receive at least 150 to 200g of IgG within 2 hours of birth (Chigerwe et al., 2009). This normally can be achieved by feeding 3 to 4 L of high-quality maternal colostrum (>50mg of IgG/ml; McGuirk and Collins, 2004). Studies have shown that failure of passive transfer causes substantial economic losses in the dairy industry because of increases rates of calf morbidity and mortality, reduces calf growth rate and efficiency and decreases first and second lactation milk production in heifers. Procedures that decrease the risk of pathogen contamination include hygienic collection, pasteurization, storage, and handling of colostrum harvested from nondiseased cows.

Understanding the role of information in identifying and improving colostrum management on farms is a key area of interest in animal welfare research. Research aimed at adoption of practices to reduce welfare risks on farms has indicated that a lack of information is a barrier. Increasing farmer awareness and education on health-related practices, such as colostrum management, may encourage improvement in welfare outcomes for calves (Beam et al., 2009).

## **Material and methods**

This study was attended by veterinarians from 30 dairy farms throughout Romania. Most of those dairy farms have herds ranging from 500 to 2000 animals (Figure 1). The study was based on a standard questionnaire with 25 questions completed in Google Forms regarding the handling,

testing, storage and colostrum feeding to dairy calves. Data were collected from March to June 2019 and the survey included an interview with each one of the veterinarians.

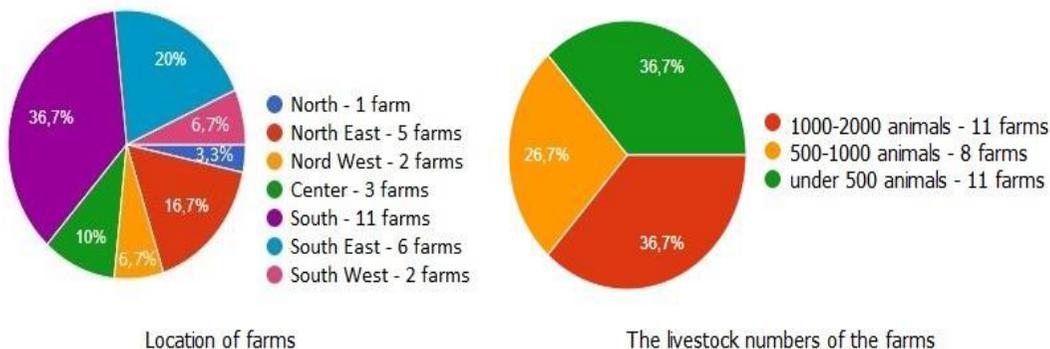


Figure 1 - Distribution in the Romania territory of the 30 farms studied and the livestock numbers of the farms

We developed a questionnaire that consisted of single or multiple choices questions, to facilitate the interview by reducing the time required and improving the homogeneity of the answers. The questionnaire included several topics from the specialized studies of the National System of Animal Health Monitoring in the United States of America. We also prepared and adapted the questions after consulting with regional specialists in the field of drug distribution in Romania, who provide consultancy on the farms they visit. The questionnaire was previously tested to verify the feasibility and showed that the interview can be completed in about 10-15 minutes. We tried to include as much detail as possible, in as few questions as possible, and with accurate, short and homogeneous answers, precisely because we noticed that those questioned do not have the patience to participate in a questionnaire that involves the elaboration of complex answers that have a very long response time.

The completed questionnaires were individually examined to identify aberrant responses, when a question was probably misunderstood. However, we have not encountered such situations.

## Results and discussions

### Separating calves from dams

Separating calves from their dams is one way to decrease the chance of disease transmission from cow to calf. For example, separation could prevent a calf from ingesting feces, bedding, or other material in the environment contaminated. Allowing a calf to acquire colostrum directly from its dam at first nursing presents many problems, such as increasing the risk that the calf will not get an adequate amount of colostrum. Also it is not possible to estimate the quantity of antibodies ingested. The practice of removing calves from their dams before nursing on the 30 dairy farms under study is 83,3%, the rest of 16,7% allow the calves to suck the first colostrum from its dam.

## Colostrum feeding

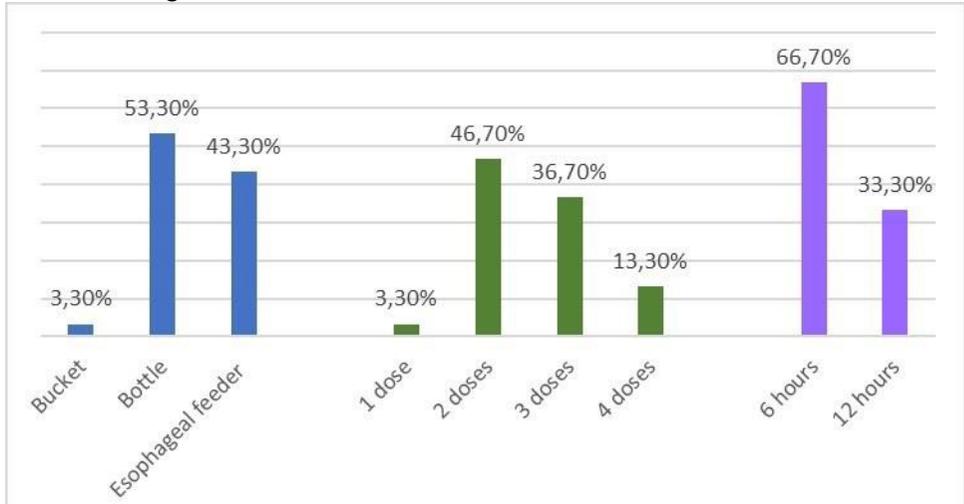


Figure 2 – Hand-fed colostrum – methods, doses and time interval of administration

Hand-feeding colostrum increases the likelihood that calves receive the amount necessary to provide adequate immunity during the first 24 hours of life. A low percentage of calves receive hand-fed colostrum from a bucket (3,3%), instead the percentage of calves that receive hand-fed colostrum from a bottle remained essentially (53,3%). The percentage of calves that receive the first feeding of colostrum using esophageal feeder is the second most used method (43,3%).

In 46,7% of feeding operations are used 2 doses of colostrum during the calves' first 24 hours of life. Colostrum doses differ from one administration to another. In 33,3% of operations the first dose is about 2 liters, the same percentage is 3 liters, and in 30% of operations the first dose is 4 liters. The second dose is administrated after 6 hours post partum in 66,7% of operations or after 12 hours post partum in 33,3% of operations (Figure 2).

In 56,7% of operations, the second dose is 2 liters of colostrum and in 33,3% of operation the second dose is 3 liters (Figure 3).

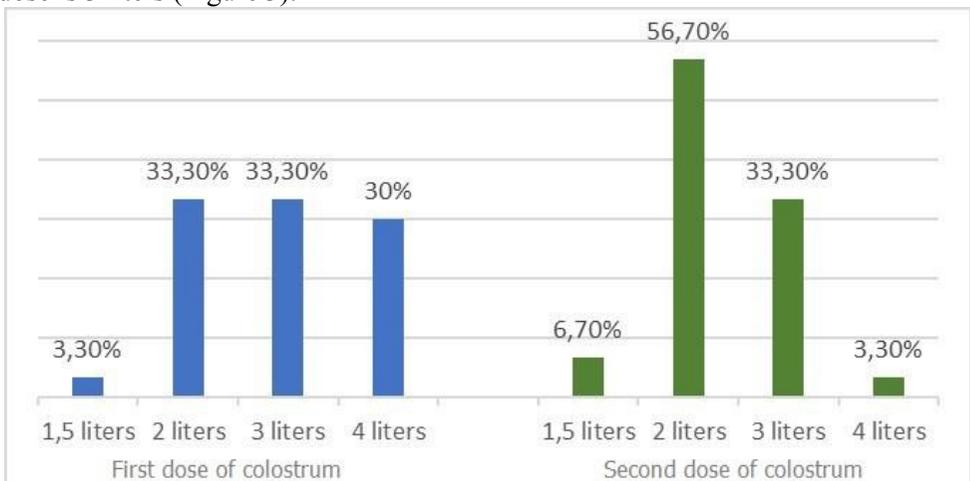


Figure 3 – Quantities of the first and the second dose of colostrum administrated in the first 24 hours of life

### Colostrum quality

Feeding poor-quality colostrum may result in decreased immunity in calves and, ultimately, increased infection. In 63,3% of operations dairy producers estimated the immunoglobulin levels of colostrum or evaluated its quality before feeding. The most common methods used for evaluating colostrum quality were a refractometer and colostrometer (64% and 36% of operations, respectively) (Figure 4). Overall, 36,7% of operations did not estimate the immunoglobulin levels of colostrum. Alternatively, serum samples from calves are evaluated for IgG level or total protein only in 26,7% of operations (Figure 4).

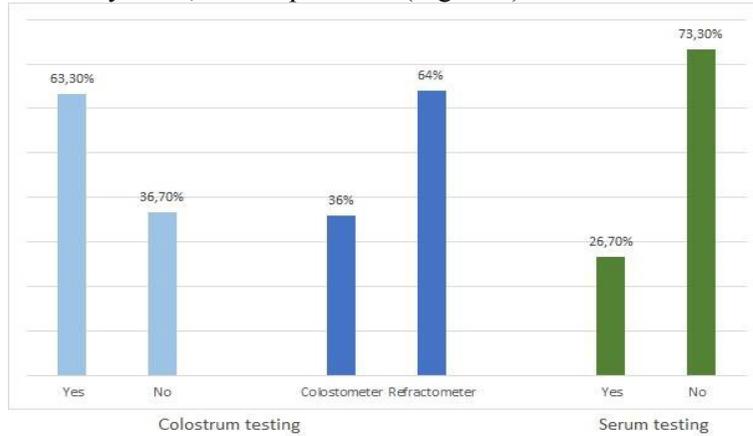


Figure 4 – Colostrum and blood serum samples testing

### Colostrum storage

The method of colostrum storage also affects colostrum quality by either increasing bacterial growth in the colostrum or by shortening its storage life. Refrigeration is recommended if colostrum is to be stored for less than 24 hours, and freezing is recommended if it is stored more than 24 hours. The most common methods of storing colostrum were freezing (80%) and refrigeration (6,7%), although 13,3% of operations did not store colostrum (Figure 5).

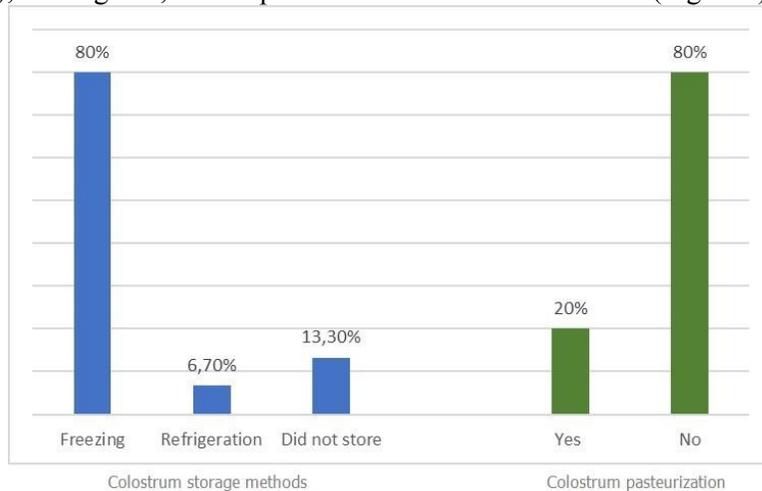


Figure 5 – Colostrum storage and pasteurisation

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### Colostrum pasteurization

Pasteurizing colostrum or milk reduces bacteria counts. Pasteurizing colostrum or milk reduces bacteria counts. In general, two methods can be used: high temperature-short time (HTST) and batch pasteurization. Since HTST pasteurization reduces immunoglobulin levels by 25 to 30 percent and increases viscosity, it is not currently recommended for use with colostrum. Alternatively, using a commercial batch pasteurization unit to heat colostrum to 60 degrees Celsius for 60 to 120 minutes reduces bacterial pathogens and does not reduce antibody concentrations or change overall viscosity. In this study, only 20% of operations that hand-fed colostrum pasteurized the colostrum before feeding it to calves (Figure 5).

### Conclusion

The way colostrum is managed and fed to calves has changed in the last years. More operations are removing calves from their dams immediately after birth, which decreases the risk of direct disease transmission. Also, the percentage of calves that received the first feeding of colostrum using esophageal feeder increased steadily. Colostrum quality is being evaluated on a higher percentage of operations. All these factors help to improve the quality of colostrum fed to calves. However, the quantity of colostrum administered in first 24 hours of life to an individual calf on dairy operations are variable. Dairy producers can improve the passive transfer of immunity by ensuring that every calf gets 4 liters of high-quality colostrum during the first 12 hours of life.

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