

Herd-Based Problem Solving:
Failure of Passive Transfer

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Characterize the Current Status of the Colostrum Feeding Program

Determine the serum total protein concentrations on a minimum of 10 calves but preferentially 12 or more calves. The calves should be 1 to 7 days but not younger than 18 hours. Serum should be separated from the clot, should not be hemolysed, and should be at room temperature. (Note: it is not necessary to centrifuge blood samples; they can be allowed to clot at room temperature). The protein concentration is stable in blood samples for up to 5-days, provided that the samples are protected from sun or extreme heat.

The colostrum management practices are considered successful when:

- 90% of the tested calves have a serum total protein concentration ≥ 5.2 gm/dl or
- 80% of the tested calves have a serum total protein concentration ≥ 5.5 gm/dl.

Failure of passive transfer in a dairy herd puts calves at a higher risk for septicemia, diarrhea, respiratory disease, navel infections or other illness before weaning. Even without illness, individual calves with FPT shed more pathogens and contaminate the calf housing environment. Over time, FPT in a herd inevitably translates into high morbidity and mortality rates amongst preweaned calves.

Troubleshooting Herd Problems of Failure of Passive Transfer (FPT):

The goal is to deliver 150 to 200 gm of immunoglobulin in the first colostrum “meal”. Consideration should be given to the potential role of each of the following factors that impair the delivery and/or absorption of immunoglobulin G (IgG) when there is FPT in a herd.

- Inadequate volume of colostrum is administered
 - Less than 4-quarts of colostrum is administered with an esophageal feeder
 - Less than 3-qt of colostrum is given to calves that suckle
- The colostrum quality is inadequate. Common reasons for reduced quality include:
 - High producing cows – colostrum dilution occurs soon after calving
 - Delayed milking – time between calving and milking exceeds 4 hours.
 - Calving cows are suckled before colostrum collection (Note: calves that remain with the cow for 30 to 60 minutes after birth frequently suckle.)
 - Cow has leaked milk or been pre-milked before calving
 - Dry period length was less than 30 days

- Significant nutritional problems with the close-up dry cows (Note: the effect is usually reduced volume rather than the quality)
- Significant health problems in the calving cows (Note: the effect is usually reduced volume rather than the quality)
- Limited or poor vaccination program (Note: standard colostrum quality tests will show normal immunoglobulin concentration but immune protection of recipient calves will be limited)

Note: There are a limited number of cow-side tests of colostrum quality and they test immunoglobulin concentration only. When using a colostrometer, the temperature of colostrum should be close to 60° F. If used on fresh colostrum, at or near body temperature, the colostrometer will falsely classify the colostrum as low or poor quality.

- Colostrum immunoglobulin absorption is impaired
 - Colostrum feeding is delayed \geq 4-hours after birth.
 - There is excessive bacterial contamination ($> 100,000$ cfu/ml) of colostrum (Note: probiotics should not be added to colostrum)
 - Colostrum supplement or replacement powder is added to colostrum
 - High level of calving assistance