

Dairy Calves Can be Tested for Failure of Passive Transfer Until at Least 10 Days of Age

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Successful passive transfer of immunity from colostrum is key for early immune function in dairy calves. Efficacy of passive transfer in calves is commonly measured using serum total protein concentration (STP) or serum immunoglobulin G (IgG) within the first few days of life. Despite this common practice, to our knowledge no research has measured changes in these concentrations over this period. The aim of this observational study was to monitor the change in IgG and STP concentrations until 10 d of age to provide a basis for recommendations for when passive transfer of immunity in dairy calves can be measured. STP and IgG concentrations of twelve calves were measured at 24 h of age and daily from until d 10 of age. Mean (\pm SD) STP and IgG concentrations were 5.83 ± 0.73 g/dL and 22.2 ± 9.6 mg/mL at 24 h of age, and 5.78 ± 0.52 g/dL and 16.1 ± 7.3 mg/mL at 10 d of age, respectively. Relative to 24 h, IgG concentration declined by (mean \pm SD) 72.4 ± 6.2 % on d 10, but STP concentrations did not decrease over time. IgG concentrations at 24 h of life were highly correlated with STP up to 7 d of age (Pearson $r > 0.84$; $P < 0.001$) and were moderately correlated at 10 d of age (Pearson $r = 0.75$; $P < 0.01$). These results indicate that calves may be reliably tested for passive transfer using STP measures until 10 d of age.

Implications: Dairy calves can be tested on-farm for failure of passive transfer by measuring serum total protein in the blood until 10 days of age.