

Laboratory Variation of Serum Immunoglobulin Analysis

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Introduction

Serum immunoglobulin is commonly measured to determine the success or failure of passive transfer in dairy calves. Many factors affect successful transfer including adequacy of the colostrum management program, the quality of the calf, colostrum quality, and the analytical method employed to assess passive transfer. Radial immunodiffusion (RID) kits are commonly used to quantify serum immunoglobulin (IgG). However, laboratory variation can be significant even when similar analytical techniques are used. The objective of this study was to compare the results of serum IgG analysis from two laboratories, each using RID kits and both having extensive experience with the assay.

Materials and Methods

A total of eighty-seven blood samples were collected into serum tubes from calves at a commercial dairy farm. All samples were collected at the same farm with similar personnel, management, and collection procedures. Blood samples were allowed to clot, split into two subsamples, frozen, and shipped to two commercial labora-

tories. The laboratories utilized commercially available RID kits to measure bovine IgG.

Results

Compared to laboratory 2, laboratory 1 reported higher values and greater variation for serum IgG analysis (11.1 ± 3.1 vs. 9.2 ± 2.2 g of IgG/L). Individual sample differences averaged 1.9 ± 2.1 g of IgG/L. If serum IgG greater than 10 g/L indicates successful passive transfer, then 67 percent of the time results for both laboratories agreed on the success or failure of passive transfer. However, 33 percent of the time the laboratories disagreed.

Significance

These data indicate that laboratory variation exists. When interpreting serum IgG results, knowledge of the laboratory, techniques, and analytical variation should be considered. Consistency is essential to reduce variation. Thus, using the same laboratory and analytical techniques will reduce variation and minimize inaccurate diagnosis.