Comparison of four methods to assess colostral IgG concentration in dairy cows

Submitted by Dan Van Arsdall on Tue, Apr 5 @ 1pm

Abstract

OBJECTIVE: To determine sensitivity and specificity of 4 methods to assess colostral IgG concentration in dairy cows and determine the optimal cutpoint for each method.

DESIGN: Cross-sectional study.

ANIMALS: 160 Holstein dairy cows.

PROCEDURES: 171 composite colostrum samples collected within 2 hours after parturition were used in the study. Test methods used to estimate colostral IgG concentration consisted of weight of the first milking, 2 hydrometers, and an electronic refractometer. Results of the test methods were compared with colostral IgG concentration determined by means of radial immunodiffusion. For each method, sensitivity and specificity for detecting colostral IgG concentration < 50 g/L were calculated across a range of potential cutpoints, and the optimal cutpoint for each test was selected to maximize sensitivity and specificity.

RESULTS: At the optimal cutpoint for each method, sensitivity for weight of the first milking (0.42) was significantly lower than sensitivity for each of the other 3 methods (hydrometer 1, 0.75; hydrometer 2, 0.76; refractometer, 0.75), but no significant differences were identified among the other 3 methods with regard to sensitivity. Specificities at the optimal cutpoint were similar for all 4 methods.

CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that use of either hydrometer or the electronic refractometer was an acceptable method of screening colostrum for low IgG concentration; however, the manufacturer-defined scale for both hydrometers overestimated colostral IgG concentration. Use of weight of the first milking as a screening test to identify bovine colostrum with inadequate IgG concentration could not be justified because of the low sensitivity.

Sources:

Chigerwe M, Tyler JW, Middleton JR, Spain JN, Dill JS, Steevens BJ.

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