DAIRY VETERINARY NEWSLETTER

February 2012

Utah Veterinary Diagnostic Laboratory now Offering *BioPRYN*® Bovine Pregnancy Test

It was announced a few months ago that the Utah Veterinary Diagnostic Laboratory had begun offering a bovine pregnancy test, from another manufacturer with some different test conditions than those below. *The UVDL is now offering the BioPRYN® bovine pregnancy test*. This is not intended to discourage rectal palpation or other reproductive diagnostic services offered by veterinarians. This is simply a tool that is gaining in popularity in the dairy industry, and sometimes makes scheduling all aspects of herd health work easier for both producers and veterinarians.

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Rocky Mountain DHIA
Effective Dairy Management

TO: Dairy producers, veterinarians, and other members of the dairy industry

FROM: Dr. Tom Baldwin, Director of Utah Veterinary Diagnostic Laboratory
Dr. Dave Wilson, Dairy Extension Veterinarian, Utah State University
Dr. Kerry Rood, Livestock Extension Veterinarian, Utah State University
Mr. Chris Tucker, Rocky Mountain DHIA

DATE: February 3, 2012

RE: Bovine pregnancy test from BioPRYN® offered by the Utah Veterinary Diagnostic Laboratory

The BioPRYN bovine pregnancy test is now available through the Utah Veterinary Diagnostic Laboratory (Logan facility). The results are highly accurate, and are comparable to rectal palpation for pregnancy diagnosis. The test detects Pregnancy-Specific Protein B in serum from pregnant cattle.

Quick Facts:

1. Cow conditions under which test can be run: At least 90 days since calving, and at least 30 days since last breeding. Embryo transfer recipients at least 32 days of embryo age.
2. Cost: $2.40 per sample.
3. Sample: Bovine serum. Minimum of 2 ml of blood or serum in red top tube or 2 ml of blood in serum separator tube. Serum is the preferred sample, but will work with plasma.
4. Turnaround time: Samples received by Monday (by noon) - results available on Tuesday. Samples received by Thursday (by noon) - results available on Friday.

If you have any questions please call the Utah Veterinary Diagnostic Laboratory at (435) 797-1895

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4 Quarts of Colostrum Fed to Calves Using an Esophageal Feeder if Necessary – Should it be Divided into Two Feedings, or is it Better to Ensure Intake?

An article titled, "4 quarts of colostrum: Too much of a good thing?" was posted on DairyHerd Network (author anonymous) on December 19, 2011. It quotes Dr. Neil Anderson, veterinarian with the Ontario Ministry of Agriculture. Dr. Anderson talks about possible negative effects of feeding 4 quarts (3.8 L) of colostrum all at once using an esophageal feeder to neonatal calves:

"'When we deliver colostrum this way, we pour 8 to 12 percent of the calf's birthweight into its digestive system in a manner of minutes,' says Anderson. 'If the calf consumed colostrum by nursing the dam, it would take in 9 to 21 percent (average of 14 percent) of its birthweight over a 24-hour period. It's not an identical process.'"

(Note: the 8% to 12% figure above means the calves would weigh between 64 to 100 pounds. 4 quarts = 8 pints, "a pint's a pound the world around", so 8 pounds = 8% to 12% of a 64 - 100 pound calf's weight.)

"Because the abomasum capacity is less than 2 quarts, the recommended 4 quarts is more than double the amount that the digestive tract can naturally handle. Anderson says too much colostrum administered too quickly can trigger a host of health problems:

Flooding the digestive tract can cause rumenitis, abomasitis, and abomasal ulcers, because colostrum enters the reticulo-rumen rather than going directly to the abomasum.

When colostrum enters the rumen directly or refluxes back into the rumen from an overfilled abomasum, it ferments in the rumen and causes rumenitis, metabolic acidosis and depressed appetites. The result: a calf that does not want to suck at the next feeding.

When colostrum spills through the pylorus, sensors in the duodenum detect the high pH and send messages back to the abomasum telling it to slow emptying in an attempt to achieve digestion and an acid pH. This contributes to an ideal environment for proliferation of clostridial bacterial that arrived as contaminants in the colostrum.

Overstretching the abomasal wall ruptures capillaries and causes hemorrhage and blood clots and areas of tissue without good oxygen supply. These also are areas favored by clostridial organisms for their growth.

Esophageal feeders also can cause physical damage to the pharynx and esophagus, and aspiration of fluid into the lungs (potentially leading to aspiration pneumonia).

As an alternative, Anderson still recommends feeding 4 quarts of colostrum. But he suggests splitting it into two feedings, over the first 10 to 12 hours of life, and avoiding esophageal feeders if at all possible. 'This produces calves that adapt much more readily to self-feeding, because they have an appetite,' he states." (Quoted article ends here.)

I have fed calves on research projects, also sometimes after delivering calves with inexperienced calf caretakers on hand who are not sure what to do, and when taking care of hospitalized calves when I was in practice. I think many veterinarians and dairy producers would agree that if a calf will suckle colostrum well, it is preferable to avoid esophageal feeders (sometimes called "lavage" feeders). It is also important of course to make sure not to "feed" a calf down the trachea into the lungs as the article mentions. Dr. Anderson makes some excellent points. However, with larger and larger dairy farms, some of which average more than 10 or 20 calvings a day, and with many farms averaging several calvings per day, I wonder how practical it may be to expect colostral feeding to be divided among 2 feedings over 12 hours. Also, and equally important, how many neonatal calves are attended to soon enough after calving that at the next feeding they will still be only about 12 hours old or so? And what about calves that just don't drink very fast, the aggravating ones that people may not have time to fool with for long periods trying to get them to drink even 2 quarts?

I decided to look for refereed publications regarding the question of whether esophageal feeder delivery of colostrum is strongly associated with subsequent complications. There is very little published literature regarding the question of esophageal feeding of colostrum.

A paper by Elizondo-Salazar et al. in Journal of Dairy Science, Sept. 2009 evaluated feeding of colostrum handled in different ways, but all 30 Holstein bull calves in the study were fed 3.8 L (4 quarts) of colostrum by esophageal feeder. Calves were fed during the first 1.5 to 2 hours after birth. All 30 calves had adequate passive transfer as defined by serum IgG levels $\geq$ 10 g/L. The range of values was not shown, but all colostral handling groups averaged > 20 g/L of serum IgG. The long-term health status of the calves was not described, and as bull calves they may not have been kept for a long time, but all lived until 2 weeks of age.

Chigerwe et al. in AJVR, Sept. 2008 reported on their interesting study regarding a variety of colostral volumes and ages when fed. 120 Holstein bull calves were randomly assigned to receive either 1, 2, 3, or 4 L of colostrum, fed once at 2, 6, 10, 14, 18, or 22 hours after birth. The paper notes that, "Lower rates of failure of passive transfer (FPT) have been reported in calves fed colostrum by use of an oroesophageal tube, relative to calves fed colostrum via a bottle or calves allowed to suckle from their dams." It also mentions the advantages of rapid colostrum administration using esophageal feeders on large farms.

30 calves received each of the 4 volumes of colostrum (5 calves per volume at each of the 6 time points). Serum IgG was measured at 48 hours of age. Using statistics described in the paper, the authors arrived at a goal of $\geq$ 13.4 g/L of serum IgG for adequate passive transfer, but also stated that 10 g/L is reasonable as a goal on commercial farms. Mean serum IgG for all calves after 48 hours was 11.4 g/L; means for each treatment group were not shown. Instead a multiple regression model was developed to predict likelihood of FPT. The model showed that serum IgG was higher and more likely to be greater than 10 g/L with 3 or 4 L

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of colostrum fed, adjusting for the important influence of the age of the calf when fed. Another model also accounting for colostral concentration had different conclusions (2, 3 and 4 L were equally effective), but as far as can be seen from the way data was presented, it appears to me that there was an advantage for 3 L of colostrum feeding that leveled off at 4 L in terms of avoiding FPT in calves. After some interesting and complicated discussion, the authors' conclusion agrees, "We recommend that calves provided colostrum by use of an oroesophageal tube receive 3 L of colostrum within 2 hours after birth".

Like the first paper, long-term calf health was not discussed. That was all of the published literature I could find; if our readers have more please let me know. Based on this work, it seems that feeding at least 3 L (I would still recommend 4 L based on experience) of colostrum as soon after birth as possible, including by use of an esophageal feeder if necessary, to neonatal calves is a good practice to avoid FPT. However, prospective studies following calves for probably at least 2 months after birth to evaluate health associations with esophageal feeders vs. suckling or bucket feeding would be useful. The practical question of an alternative to esophageal feeders for adequately administering colostrum in a timely way remains.

Please let us know your comments and also suggestions for future topics. I can be reached at (435) 760-3731 (Cell), (435) 797-1899 M-W, (435) 797-7120 Th-F or David.Wilson@usu.edu.

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