



We are finding better ways to raise replacements

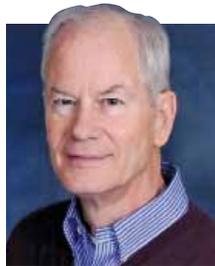
Improvements in colostrum evaluation, water delivery, postweaning group strategies, and feeding dried distillers grains headlined calf and heifer research at this year's American Dairy Science Association meetings.

by A. F. Kertz

IN JULY, the American Dairy Science Association (ADSA) scientists and industry professionals met in New Orleans, La. What follows are a few snippets of presentations that related to dairy calves and heifers.

Rapid methods to estimate IgG levels

Description: Researchers set out to validate a rapid, cow-side method to estimate IgG levels based on colostrum's caprylic acid fraction. After this initial screening, a refractometer



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was used to screen the IgG-rich supernatant.

The research team compared 827 colostrum samples from 67 farms in 12 states. Samples were categorized into three groups: fresh, not stored (number = 196); previously frozen (490); or refrigerated (152). To keep the process simple, test tubes were prepped with caprylic and acetic acids beforehand so only colostrum was added on-farm. Researchers compared this test to the industry's "gold standard," the radial immunodiffusion lab method.

Take-home message: Using the caprylic acid test to precipitate or remove non-IgG proteins may result in more specific IgG readings in fresh colostrum on the farm. However, reading untreated fresh colostrum with only the refractometer was nearly as accurate.

While this method predicted high-quality colostrum (greater than 50 g/liter) extremely well, it occasionally identified poorer-quality colostrum (less than 50 g/liter) as "good quality." Similar results were found for both Holstein and Jersey colostrum. Eventually, this method may be able to replace the time and cost of the radial immunodiffusion method

and be more accurate than a colostrometer.

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Water restriction before and after weaning

Description: Two studies were conducted to compare the impact of free-choice versus restricted water intake during the milk replacer feeding period and the two weeks following weaning. Study 1 was conducted spring of 2009, and Study 2 took place during the summer of 2010. A total of 114 (Study 1 = 44; Study 2 = 70) 2- to 4-day-old Holstein calves were assigned to one of two treatments: (1) Free-choice water intake for 56 days or (2) Restricted water intake. In the restricted water treatment, no water was available the first 36 days of the study. Limited water (5 pounds per day) was offered Days 36 to 42 followed by free-choice from Days 42 to 56.

All calves were fed 0.62 pounds of a 20:20 milk replacer powder in 4.4 pounds water twice daily from Days 1 to 35 and once daily beginning on Day 36 until weaning at 42 days. An 18 percent crude protein calf starter was offered free-choice for the duration of the study.

Take-home message: Overall, they found no differences between water-restricted or free-choice water treatments in calf starter intake and daily gain. At first glance, these results seem inexplicable. But, after reviewing the research, the key was that for the week prior to full weaning, calves on the restricted treatment were provided 5 pounds of water daily. Previous studies that measured water intake found a ratio of 4 pounds of water per 1 pound of dry matter intake. A large database published in 2009 in the *Journal of Dairy Science* (JDS) from a German dairy research farm found this same ratio for lactating dairy cows (it would be higher in hot weather). And Penn State studies with growing heifers in the May 2011 JDS found this same 4-to-1 ratio of water to dry matter intake. So, water is an integral

DIETS WITH 21.9 TO 33.8 PERCENT dried distillers grains with solubles (DDGS) resulted in similar weight gains. At higher DDGS levels, heifers had slightly smaller frames and slightly greater body condition.

factor in dry matter intake and performance.

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Group calves based on intake

Description: Weight was recorded at birth, Week 6, 9, and 12. During data collection, calves were housed at a calf-raising facility from birth to approximately 7 months of age. They were moved to a heifer-raising facility from 7 months until heifers reached 247 days of pregnancy. Then, they were moved to the dairy.

Out of the 755 heifers, 206 were culled (27.3 percent) and 491 calved to date (65.0 percent). Intake rates did not have a significant effect on cull rate. In addition, there was no significant correlation between birth weight and 305-day milk production or between average dairy gain (ADG) and 305. First-lactation milk production averaged 25,400 pounds and did not differ between groups. In this study, birth weight, early intake, and ADG of calves did not have an effect on first-lactation production.

Take-home message: There are many factors which affect first-lactation milk yields. It can take thousands of calf records, and then following these calves into lactation, before individual factors like those evaluated in this study may show up as impacting milk yield. If the impact is as little as 5 percent, it will require very large databases just as for DHI milk production records. Studies such as this are hopefully only in the first wave of searching for such factors.

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Dried distillers grains fed to heifers

Description: This study involved 133-day-old Holstein heifers with an initial body weight of 378 pounds for 24 weeks. The main objective was to examine the effect fat from dried distillers grains with solubles (DDGS) had on heifer performance.

Treatment diets were: (1) control containing ground corn (15.9 percent of DM) and soybean products (17.9 percent); (2) low-fat containing low-fat, high-protein DDGS (21.9 percent) and ground corn (11.9 percent); and (3) high-fat with traditional DDGS (33.8 percent). All diets contained 39.8 percent grass hay, 24.8 percent corn silage, and 1.5 percent vitamins and minerals. Diets were formulated for 16.3 percent crude protein (DM basis), 9.8 percent rumen degradable protein, and 6.5 percent rumen undegradable protein. The high-fat diet contained 4.8 percent fat compared with 2.8 percent in the control and low-fat diets which were greater in nonfiber carbohydrates (NFC). Diets were 1.0 Mcal/kg of DM and limit-fed at 2.45 percent of body weight.

Dry matter intakes, body weight, and daily gains (2.0 pounds) were similar among diets, but hip heights and body length were less with the high-fat DDGS diet. Body condition scores also tended to be greater with the high-fat DDGS diet.

Take-home message: Feeding diets with traditional DDGS, and at the levels used in this study, may result in similar body weight gains with slightly smaller body frames and slightly greater body condition. This is an ongoing study that will include blood analyses, onset of puberty, and subsequent reproduction and milk production.

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