Hay, hulls in calf starters troubling

In my November column (Kertz, 2008a), concerns were expressed about the state of many calf starters. Consequently, this column will address issues related to calf starters containing either cottonseed hulls or straw. While there are clear data about the negative effects on rumen development and performance when CSH or hay were fed to calves in starter form before and somewhat after weaning (Warner et al., 1991), most U.S. dairy farmers begin feeding hay to calves at an average age of about 24 days (National Animal Health Monitoring System, 2007). A recent study by Kertz (2008a) provides the basis for evaluating the effect of using CSH or hay in calf starters.

A series of four trials were done using 48 purchased bull calves with an initial body weight of 25.8 ± 3.2 kg and weighing 92 lb for the first three trials. The fourth trial used 58- to 60-kg calves and weighed 130 lb at an average age of 154 lb. All calves were housed in unheated individual pens bedded with straw, and when they were moved into group pens of six calves each. The dry matter (DM) and organic matter (OM) digestible voluntary daily gains (EBWADG) were arrived at with an equation (Jahn et al., 1976) that essentially calculates feed conversion of crude protein (CP) and acid detergent fiber (ADF). For each calf, the milk replacer feeding programs were:

- 20% milk/CPS: 20% fat at 1 lb, daily, split into two loads. Calves were fed for 25 days, followed by the morning feeding only for days 26-28 for trial 1 (March through May), and
- 26% milk/CPS: 17% at 1.75 lb, daily, split into two feedings for days 1-28, followed by the morning feeding only for trial 2 (February through May), and
- 26% milk/CPS: 17% at 1.75 lb, daily, split into two feedings for days 1-28, followed by the morning feeding only for trial 3 (September through November).

Starter and water were fed free choice in each of these trials. As noted above (August through September), calves were maintained in four pens of six calves each per treatment, and we fed starter and water free choice.

The texturized calf starter control (8% energy basis by the first three trials was similar in particle size to the starter used by Porter et al. (2007). It contained 15% CP, 25% ADF, and 25% oats and averaged 18.1% CP, 5.7% ADF, and 14.3% neutral detergent fiber (NDF) on a dry matter basis. The CSH averaged 90% dry matter and 3.4% CP, 57% ADF and 79.2% NDF on a dry matter basis. The hay was mostly mixed timothy grass and averaged 89.8% dry matter, 14.2% CP, 29.0% ADF, and 46.6% NDF on an as-fed basis. As CSH or hay were added to the control calf starter diet to form the various other diets, this tended to decrease CP while increasing ADF/NDF accordingly in a similar fashion. The average CP of 5% CSH (data not shown) to the control, and then compared to the control, tended to decrease ADG (P < 0.10) and EBWADG (0.075-0.087) after feeding for 28-56 days (days); and during days 56-84 (P < 0.08), but with an accompanying greater (P < 0.06) calf starter intake during days 28-56. During days 56-84, CSH calf starter intake tended to decrease (P < 0.12). This effect is indicative of calves trying to compensate for the constant reduced ADG for about 24 weeks (28-56 days) with greater starter intake when CSH was included at 5% but not being able to do so enough that ADG and EBWADG both decreased. During trial 2, NDF intake (25.8±3.2 kg) was added to both the control and 5% CSH calf starters), calf starter intake decreased (P < 0.04), and so did EBWADG. This indicated that rumen fill was increasing with the hay addition but that calves could not maintain enough intake to prevent a loss in EBWADG. This was reflected in the much greater (P < 0.01)0.09) ADG intake limiting total intake while creating rumen fill. In trial 2, the addition of 5% or 10% CSH or 5% hay decreased ADG (P < 0.02-0.10) and calf starter intake (P < 0.04) in the fist 5-7 weeks. After this period, the calf starter intake increased (P < 0.14) linearly across time periods (1-2 weeks) and after weaning (28-56 and 56-84 days; Table). It is always good to have postweaning body weights (BW) and complete the picture in trying to measure or discount any postweaning response. This postweaning response can be quite variable as calves increase or decrease intake with an accompanying apparent large increase in ADG, decrease in growth rates, and this study, it is evident that hay has a very negative effect on rumen development, fill and function. Why is CSH used considerably in some parts of the U.S. for calf starters? I think it is because the hulls are considered to be “safe.” While there is a limit marginal category of animal acidosis and thus are safe, I know of no data that show what effect CSH may have on development of rumen function, since the hulls have low fermentability and digestibility, they most likely contribute little, if any, to rumen papillae development. If so, then calves would struggle more when they go off a calf starter that contained CSH to diets with forage after weaning because development would have been limited. Also, false growth may occur since greater rumen fill was noted in this study. If you use EBWADG, it was calculated rather than just ADG.

Diagnostic forum launched

OHIO State University’s Center for Diagnostics Assays (CDA) has launched a first-of-its-kind free internet forum aimed at bringing together animal and plant disease diagnostic professionals in a single, convenient place to share the latest information on diagnostics services and technologies.

DiagnosticSpeak — available at www.diagnosticsspeak.com — is a resource for any professional who works with diagnostics, including university researchers studying infectious diseases and food safety, large- and small-animal veterinarians and technicians, industry personnel involved in purchasing or using diagnostic laboratory professionals and manufacturers of assays and reagents.

“DiagnosticSpeak is a place for researchers to share such information about infectious disease diagnostics, there is no single site known for quick collaboration among academicians, industry, manufacturer- ers of CDA and other professionals working to diagnose diseases in animals and plants,” said CDA director Darrell Jackwood, a molecular biologist with the university’s Ohio Agricultural Research & Development Center.

Worldwide in scope, Diagnostic-Speak seeks to connect the scientific community of infectious disease investigators with each other and with the end users of diagnostic tools.

“If someone has a question about a disease, test or technology, they can come to the site and find the right person with the right answer,” Jackwood said.

Among other goals, the forum seeks to facilitate the exchange of ideas about the most effective and efficient diagnostic assays; discuss and better understand the meaning and value of diagnostic assay results; explore new diagnostic technologies; keep up to date on new and emerging diseases; search for needed diagnostic reagents, kits and samples, and promote collaborations among academia, industry and government laboratories. Forums will address a wide variety of areas, including bacteriology, parasitology, entomology and vectors, food safety, assay technology and many others.

The Bottom Line

This study confirmed limitations with calf starters containing CSH or hay since they contribute to greater rumen fill, even if daily gains and bodyweights do not reflect the changes.