January 1998

Solvent-Extracted Germ Meal for Receiving Calves

Daniel Herold
University of Nebraska-Lincoln

Mark Klemesrud
University of Nebraska-Lincoln

Terry J. Klopfenstein
University of Nebraska-Lincoln, tklopfenstein1@unl.edu

Todd Milton
University of Nebraska-Lincoln

Rick Stock
Cargill Corn Milling, Blair, NE

Solvent-Extracted Germ Meal for Receiving Calves

Daniel Herold
Mark Klemesrud
Terry Klopfenstein
Todd Milton
Rick Stock[1]

Calves fed solvent-extracted germ meal blended with corn bran and steep liquor in a receiving diet exhibited satisfactory performance and intake.

Summary

This study evaluated solvent-extracted germ meal as a dietary ingredient for receiving calves. Treatments were 7% of dry matter as either corn bran or solvent-extracted germ meal in 55% concentrate diets. Average daily gain, dry matter intake and feed to gain ratio were not influenced by treatment. Dry matter offered for the first 7 days calves were in the feedlot also did not differ due to treatment. Both dry matter consumption and calf performance indicated solvent-extracted germ meal can replace up to 7% corn bran in the diet without influencing either dry matter intake or performance.

Introduction

Calves entering a feedlot are very susceptible to respiratory diseases due to the combined stress of weaning, shipping, being mixed with cattle from different origins and adapting to a new environment. Good vaccination and antibiotic programs are effective in combatting the incidence and severity of respiratory disease, but perhaps the most crucial factor contributing to reduced calf morbidity and mortality is adequate nutrition.

Unfortunately, during the first few days following arrival at the feedlot, calves will typically eat less than 50% of their normal feed intake and are hesitant to consume feedstuffs they are unaccustomed to. Therefore, receiving diets for calves must be a concentrated source of high-quality protein, digestible energy, vitamins and minerals to approach meeting requirements when intakes are low. Byproducts of the wet corn milling industry can serve as components of receiving diets. These byproducts provide both protein and energy and also can be economical alternatives to corn. Corn bran and corn steep liquor combined produce wet corn gluten feed, which has been demonstrated to be an acceptable ingredient in calf receiving diets (1995 Nebraska Beef Report, pp. 28-30). Solvent-extracted germ meal, a byproduct of corn oil production, has not been readily available to Nebraska cattle producers. However, this product could constitute an additional energy source for ruminant diets, either alone or blended with corn bran and(or) steep liquor. The objectives of this research were to determine if solvent-extracted germ meal can serve as a dietary ingredient for receiving calves without diminishing intakes and performance, as well as to assess acceptability of this byproduct in the first week of feeding.

Procedure

Between October 14 and November 15, 1996, 785 medium-framed steer calves (448 lb) were blocked by source

Table 1. Diets used in the receiving trial (% of DM).

Ingredient	Treatment	
	SEGM[a]	BRAN[b]
Dry-rolled corn	31.00	31.00
Alfalfa hay	30.00	30.00
Grass hay	15.00	15.00
Corn steep liquor	7.00	7.00
Dry corn bran	7.00	14.00
Solvent-extracted germ meal	7.00	——
Corn gluten meal	2.45	2.45
Salt	.30	.30
Limestone	.10	.10
Tallow	.10	.10
Trace minerals[c]	.03	.03
Vitamin premix[d]	.02	.02

[a]Solvent-extracted germ meal.
[b]Dry corn bran.
[c]10% Mg, 6% Zn, 4.5% Fe, 2% Mn, .5% Cu, .3% I, and .05% Co.
[d]15,000 IU vitamin A, 3,000 IU vitamin D, and 3.75 IU vitamin E per gram of premix.

and assigned randomly to one of two dietary treatments. Treatments were 7% of the diet DM, comprised of either solvent-extracted germ meal (SEGM) or dry corn bran (BRAN) added to a blend of 7% steep liquor and 7% BRAN (Table 1). Therefore, corn byproducts comprised 21% of dietary DM, which was balanced to provide a minimum of 13.5% CP, .5% Ca, .3% P, .6% K and 45% roughage. Calves originated from sale barns or were purchased directly from Nebraska ranches. Loads received early in the day were processed before feeding; those arriving late were fed grass hay, allowed access to water and processed early the next day. Processing procedures involved vaccination for respiratory disease, treatment for internal parasites, weighing, application of identification tags and alternately sorting animals into one of two pens as they exited the chute. A total of nine loads of cattle were received from different sources, allowing 15 pens per treatment.

On day 1 of the receiving trial, calves were enticed to the bunk with one small square bale of grass hay per pen, in addition to the 6 lb DM of dietary treatment per animal. No grass hay bales were offered thereafter. However, calves were allowed to consume any baled grass hay remaining in the bunk after the first day. Treatment diet DM to be fed was determined each morning to allow ad libitum access to treatment diets while minimizing orts. Calves were offered the receiving diet treatments for an average of 28 days. During the last four days, calves were limit-fed their respective treatments at an estimated 2% of body weight (DM basis) to minimize animal weight variation due to fill, and final weights were obtained.

Throughout the receiving trial, calves were observed daily for signs of sickness. Those showing signs of respiratory disease or exhibiting feeding indifference were removed from their pen and checked for elevated body temperature. Calves with a rectal temperature above 103.5°F were treated with long-acting antibiotic at three-day intervals or until body temperature returned to normal. Animals exhibiting signs of severe illness were pulled from their pen, housed where they could be frequently observed and the treatment diet was offered. However, intakes of ill animals did not contribute to treatment data until they were returned to their home pen in improved health, typically within three days.

Results

Calves in both treatments performed exceptionally well throughout the feeding period. Average daily gain for SEGM (2.60 lb) and BRAN (2.49 lb) treatments were similar (P=.22, Std err=.06). Calves assigned to the 7% BRAN treatment consumed an average of 13.35 lb of DM daily, which was not different than 13.12 lb of DM intake exhibited by the 7% SEGM cattle (P=.19, Std err=.12). Daily dry matter delivered for the first week calves were in the feedlot was an indication of diet acceptability. Unlike DM intake data, DM delivery data do not account for weight of DM remaining in the bunk. Orts present at the time bunks were read were appraised visually without being collected and DM offered adjusted as necessary. For the first seven days calves were in the feedlot, the average daily DM delivered did not differ due to treatment (P=.67, Std err=.21). The SEGM treatment was delivered at an average rate of 7.42 lb per calf daily in the first week of the trial; the DM delivery associated with the BRAN diet was 7.55 lb per calf. Similar DM delivery during the first week suggests calves accepted both blends of byproducts equally at this dietary level. Due to a numerically higher average daily gain and lower DM intake, calves consuming the SEGM diet appeared to have a more favorable feed to gain ratio (5.04) than those assigned to the BRAN treatment (5.37). Analysis of these data approached significance (P=.10) suggesting SEGM may contain more energy than BRAN. This, however, is difficult to conclude at this level of dietary inclusion.

Calf mortality was not influenced by treatment. Two calves from the same load, but assigned to different treatments, died within four days of receiving due to advanced respiratory disease. Of calves assigned to the BRAN treatment, 49 were pulled and treated due to elevated temperatures, whereas 61 calves assigned to the SEGM diet were likewise treated. This level of calf morbidity resulted in 12.5 and 15.6% of the BRAN and SEGM calves being treated, respectively.

Results of this study showed that SEGM can replace a portion of BRAN in calf receiving diets without diminishing performance or DM intake. Calves consumed SEGM and BRAN diets to the same extent during the critical first week after arriving at the feedlot and exhibited exceptional gains and health throughout the receiving period. Feeding corn byproducts as a portion of the dietary concentrate in receiving diets can diminish the need for corn and increase use of alternative feedstuffs not acceptable for use in the production of nonruminant species.

---

[1]Daniel Herold and Mark Klemesrud, research technicians; Terry Klopfenstein, Professor, Todd Milton, Assistant Professor, Animal Science, Lincoln; Rick Stock, Cargill Corn Milling, Blair, NE.