

Public Abstract

First Name: Jason

Middle Name: Ryan

Last Name: Russell

Adviser's First Name: Monty

Adviser's Last Name: Kerley

Co-Adviser's First Name:

Co-Adviser's Last Name:

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Title: Improving fiber byproduct utilization in high concentrate diets

Alternative dietary energy sources in feedlot rations are important as conventional energy sources like corn increase in cost. Compared to corn, soybean hulls and other fibrous byproducts have reduced cost per ton but fibrous byproduct inclusion also reduces average daily gain and feed efficiency in corn-based diets. Improving performance in animals fed corn-based diets containing fibrous byproducts can reduce ration cost and increase profitability for cattle producers. Previous work has not been conclusive on the optimum corn inclusion rate in fiber-based diets. Similarly, fibrolytic enzyme addition in corn-based diets has generated inconsistent results. The effects of starch and fiber combinations in feedlot diets were examined to determine optimum combinations for diet digestibility and animal performance as well as identify opportunities for fibrolytic enzyme inclusion improvement. Experiments were performed to pinpoint the maximum corn inclusion rate in soybean hull-based diets and determine the effects of fibrolytic enzyme addition to whole shell corn diets with increasing fiber inclusion. Soybean hull diets with increasing whole shell corn inclusion rates were compared in fermenters simulating a digestive tract as well as in feedlot cattle. Fiber digestibility was optimized between 80:20 and 90:10 soybean hulls:corn in the fermenter study and optimized at 80:20 in the feedlot cattle. Average daily gain and feed conversion decreased as corn inclusion increased. A commercial proprietary enzyme mix (Cattlemace, R & D Life Sciences LLC, Menomonie, WI) was added to whole shell corn diets with increasing soybean hull inclusion fed to fermenters and live steers. In the fermenters, fiber digestibility increased but overall diet digestibility decreased as soybean hull inclusion increased and enzyme inclusion improved fiber fermentation. In the steers, there was no difference in average daily gain and feed conversion for 100% corn diets versus 86:14 and 72:28 corn:soybean hulls. There was no enzyme effect on 100% corn or 93:7 corn:soybean hull diets. An 80:20 soybean hull:whole shell corn diet optimizes fiber digestibility and animals can consume whole shell corn diets containing 14-28% SH and 0.045% enzyme without negative effects on growth performance as compared to all whole shell corn diets.