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Barley and Distillers Grains Make Great Cattle Ration

Expanded ethanol production is creating opportunities for the feed barley market around the world, says a North Dakota State University animal scientist.

“Barley and distillers grains complement each other exceptionally well in diets for ruminant animals,” according to Vern Anderson, NDSU Carrington Research Extension Center animal scientist. “This combination provides the appropriate protein and starch digestion pattern for optimum animal performance. Research trials have observed excellent performance with this combination of feeds when forages and supplements are included.”

Publications on ruminant protein requirements describe the proper proportion of rumen- degradable and undegradable protein critical to optimum animal performance. Approximately 60 percent of protein (rumen-degradable protein) should be digested in the rumen. The 40 percent that does not degrade (bypass, escape or rumen-undegradable protein) passes through the rumen and into the lower gut, where it is absorbed as peptide chains or amino acids. The rumen-degraded protein provides nitrogen to support the billions of microbes (primarily bacteria) that digest forages and grains.

Barley and distillers grains complement each other for these needs in ruminant diets. Barley degrades readily in the rumen providing nitrogen to the microbes. Distillers grains, especially dry distillers grains, are high in escape protein, providing animals with a directly absorbable protein source (undegradable protein).

Research conducted at the NDSU Carrington REC has proven the value of barley and distillers grains combinations, Anderson says. One study included wet and dry distillers grains with urea as the rumen-degradable protein source in the barley-based beef finishing diets.

Treatments included:

- * High level of rumen-degradable protein at 72 percent and undegradable at 28 percent
- * Rumen-degradable at 65 percent and undegradable at 35 percent
- * Rumen-degradable at 67 percent and undegradable at 33 percent
- * Rumen-degradable at 62 percent and undegradable at 38 percent

Dry matter intake (DMI) improved with any distillers product in the diet (27.1 lbs) compared with the highly rumen-degradable diet (24.2 pounds). Daily gains also were significantly greater with wet and/or dry distillers grains in the ration (3.61 pounds), compared with no distillers grains (3.30 pounds).

A second study with barley finishing rations evaluated stepped increases of dry distillers grains ranging from 0 percent to 36 percent of DMI. Steers ate more feed and gained faster (4.34 pounds) on the 24 percent distillers grains diet, compared with the other percentage options.

“The 24 percent distillers grains diet provided exactly 60 percent degradable and 40 percent undegradable protein to the rumen,” Anderson says. “Canola meal, which is highly rumen degradable, was used as the control protein source. This and other studies are continuing and will investigate other combinations of barley and distillers grains.



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“This research applies to all ruminant animals, including lactating dairy cows, bison, or beef,” he adds. “Barley and distillers grains fed together provide a safe, nutritious, palatable and productive diet.”

Corn can be fed with distillers grains, but an additional degradable-protein source is needed in the ration.

“Also, the escalation in the price of corn, due to demand for ethanol production, may price it out of many markets,” Anderson says.

The northern tier of states in the western U.S. and western Canadian provinces produce most of the barley in North America. North Dakota leads all states in barley production.

“New barley varieties developed at NDSU and other institutions are showing significant yield improvements and will be highly suitable for feed production and possibly for malting,” Anderson says.

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