The Barley Option

As the price of rival feedgrains rise, barley is emerging as an attractive alternative.

Story & photos by ***Ed Haag***

In April, U.S. Department of Agriculture (USDA) statisticians readjusted their figures upward on the futures price of corn while noting that their estimates for small grains, such as wheat and barley, were consistent with their earlier predictions.

Even though, historically, the price of feed barley does follow the lead of feed corn, many backgrounders and feedlot operators who normally ship in their corn from out of state will be looking to alternatives. This also applies to the growing number of producers who have embraced retained ownership and are also concerned about the cost of finishing out their animals.

"When those involved in finishing cattle see the prices of railed-in corn going up, they often look to barley as an alternative," says Greg Lardy, Department of Animal and Range Sciences, North Dakota State University.

Most commodity analysts don't expect feeder corn prices to drop soon for long-distance buyers, as the cost of shipping is expected to rise with escalating fuel prices. Even the biofuel revolution, with its predicted increases in corn acreage, will probably bypass areas that do not have the corn production to support a distillery. Ethanol production does benefit feeders who locate close to the plants and take advantage of byproducts such as corn-based distillers' grains, but the impracticality of shipping this high-moisture feed source any distance negates the benefits to those outside of corn-producing areas.

For financially pinched feeders outside of the Corn Belt, Lardy sees barley as one viable option.

Barley as feedgrain

It's not as if barley isn't a proven finishing grain for beef producers. With the exception of the United States, much of the rest of the world relies on barley to feed out cattle, Lardy says. This applies to Europe and more than half of Canada. In the United States, barley plays a key role as a feedgrain in parts of the Great Lakes region, as well as on the Northern Plains, the Mountain States, the Pacific Northwest and Alaska. While most barley growers outside of the Pacific Northwest focus their efforts on producing malting barley — usually receiving a $1-per-bushel (bu.) premium above feed barley — in any given year at least 50% of the U.S. crop does not make malting grade and is sold as livestock and poultry feed.

Lardy notes that feed barley shares similarities but has some differences when compared with feed corn. "Heavy-test barley — 50 pounds (lb.) per bushel or better — is essentially equal to corn on an energy basis," he says. "Lighter-test barley can be considerably less than corn."

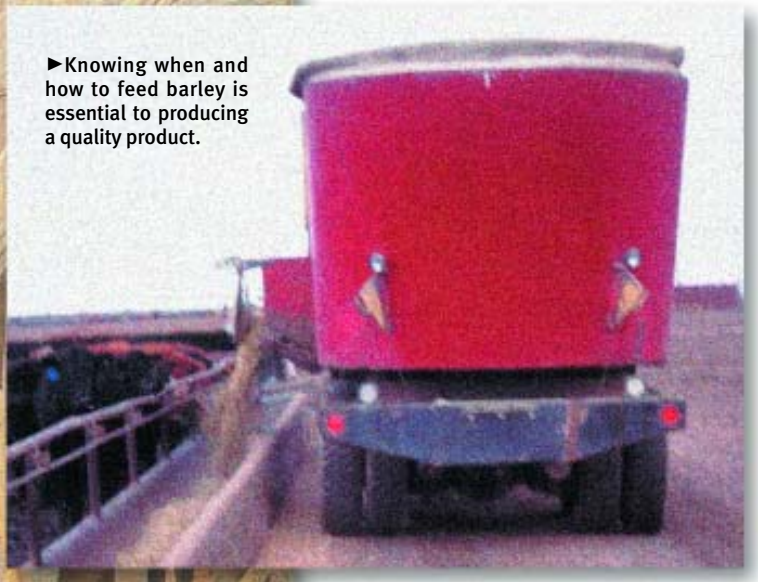
All barley isn't the same

For Lardy, one of the mitigating factors about barley as a feed is its nutritional variability. He points out that unlike corn, which remains relatively consistent in terms of feed efficiency, barley's feed efficiency can swing dramatically depending on where it was grown, the climatic conditions in a particular year and the variety. Limited soil moisture at specific times in a barley plant's growth can reduce the weight of its kernels. This is also possible when a plant is struck with unseasonably hot weather during the maturation process.

No matter the reason, lower test weight in barley always means lower feed efficiency. "The reason for that is that the lower-test-weight barley has a higher percentage of hulls than the heavier test weights," he says. "And, the fiber in hulls, unlike the fiber in corn kernels, is relatively indigestible."

Because of this, the price of feed barley is usually based on test weight. Lardy notes that even though 50-lb.-bu. barley tests equal corn's energy value, as the bushel weight decreases, the energy value drops off precipitously. "For the midrange of test weights, maybe a 45-lb. bushel, we are looking at 95% to 97%," he says. "Under that weight, you are probably down around 90% or less."

Although this translates into the need to feed a higher volume of lighter-test-weight barley to get the same gain as its heavier counterparts or corn, a study published in the *Canadian Journal of Animal Science* (71:867-878) reported that the increase wasn't that significant. Light-test-weight barley required 4% more feed per unit gain than those fed medium or heavy barleys.



►Knowing when and how to feed barley is essential to producing a quality product.

Table 1: Effect of grain source and processing method on performance of yearling steers

	100% HMC*	67% HMC, 33% Barley	33% HMC, 67% Barley	100% Barley	50% Barley 50% DRC	100% DRC	100% SRC
ADG, lb. per day	3.7	3.7	3.5	3.8	3.9	3.8	3.7
DMI[a],lb. per day	26.6	27.6	26.1	25.9	26.5	27.2	26.2
F:G[b]	7.2	7.4	7.4	6.8	6.8	7.2	7.0

Source: Duncan et al., 1991. Reprinted with the permission of Washington State University.

*HMC = high-moisture corn; DRC = dry-rolled corn; SRC = steam-rolled corn; ADG = average daily gain; DMI = dry-matter intake; F:G = units of feed required per unit of gain.

[a]Cubic effect of barley level with HMC ($P < 0.05$).

[b]Quadratic effect of barley level with HMC ($P < 0.05$).

Other comparisons with corn

Another difference between corn and barley is protein level, Lardy says. In that matchup, barley wins hands down vs. corn. "Barley delivers one and a half times the protein over corn," he says. "That is an average of 9.5% protein in corn versus 15% in barley."

This means that those who use barley in their finishing ration are less likely to need supplementary protein than they do when using corn.

Besides the exceptions mentioned already, Lardy feels that quality feed barley and quality feed corn perform equally as well as long as the person responsible for feeding understands how to generate the best return out of the grain being fed.

Lardy notes that his view is supported by most of the research comparing the two popular feedgrains. One study published in 2004, conducted by the research faculty of the University of Guelph (U of G), Ont., Canada, compared each grain's cost-effectiveness in a finishing ration and each grain's effect on carcass quality. Beef production in Ontario is based on corn, while barley is the primary feedgrain energy source in western Canada.

"We wanted to see if there was similar results between both of those grain sources in cattle performance and overall eating quality," says Phil McEwen, a researcher participating in the project.

The research was initiated by the Ontario Cattle Feeders Association, an organization whose primary goal is to increase the quality, consistency and market share for Ontario corn-fed beef.

In two trials, the first with 92 Angus steers and the second with 108 Charolais steers, the participating animals were fed on a free-choice basis with the individual feed intake of each steer measured using a Calan Gate feeding system. Both groups received a ration of barley or corn blended with 15% or 50% corn silage. This was done to help determine if the volume of silage had any effect on either grain's performance. Angus cattle were marketed after achieving an assigned body weight of either 1,210 or 1,320 lb., while Charolais cattle were marketed at 1,320, 1,430 or 1,540 lb.

In the Angus trial, with the exception of the corn-fed animals having greater feed intakes and greater daily gains while requiring fewer days to market than barley-fed cattle, all other measurements were virtually the same, McEwen says, adding that this applied to feed efficiency, market weight end point, carcass measurements, marbling, ribeye and eating quality traits such as tenderness, juiciness and flavor. "There really was no discernable difference."

Predictably, feed efficiency was poorer for both grains when used in the higher-silage diets. Similar results were recorded for the Charolais trial, McEwan adds.

During the past two decades, several other studies confirm McEwan's views, including one in which researchers at Washington State University gradually replaced high-moisture corn with varying percentages of steam-rolled barley in a finishing diet containing 65% grain, 8% corn silage, 8% alfalfa hay, 5% supplement and 14% potato-processing residue.

Results showed that only small differences were noted in feedlot performance, carcass traits, or meat composition and appearance. The barley contained, on average, 93% of the energy content of corn.

The researchers also noted that professional beef evaluators could only detect small effects of dietary treatment on beef firmness, wateriness, color or color stability. A separate consumer taste panel failed to differentiate between the corn- and barley-fed beef. Because of these findings, the researcher concluded that the perception that barley-fed beef is inferior or superior to corn-fed beef was not substantiated (see Table 1).

In all fairness, not all studies have resulted in consumer tasters seeing no difference in flavor between corn- and barley-fed beef. One recent study, conducted by researchers at the University of Nebraska, focused on U.S. consumer response to U.S. corn-fed beef, Canadian barley-fed beef and Australian grass-fed beef. Twenty-four taste panels, comprised of 273 consumers in Denver and Chicago, evaluated strip steaks for flavor, juiciness, tenderness and overall acceptability on an eight-point hedonic scale. Results showed that 52% preferred corn-fed beef, 29% barley-fed beef and 19% grass-fed beef.

Feed management skills essential

Lardy notes that although most studies show barley is comparable to corn as a finishing feed, barley does have characteristics that should be fully understood by those intending to introduce it into their feeding regimen.

"In our market, barley is sold at a discount to corn," he says. "It is considered a harder grain to feed than corn."

He notes that a smart feed manager who knows the fine points about feeding barley can turn that to his advantage by increasing the feed efficiency on the barley and generating more weight gain per dollar than is expected. To Lardy, one of the most important facts about feeding barley is that barley starch ferments far more rapidly than cornstarch.

"As a result, when you are receiving the cattle and stepping them up on to a finishing diet, you want to take a little more time making that adjustment with barley than you do with corn," he says. "Attention to detail is very important."

This extends to processing the barley. "Generally speaking, if you are dry-rolling the barley, you want to do a coarse roll to reduce the amount of fines," Lardy says, adding that in Canada, much of the feed barley is soaked 24 hours before rolling to help maintain the grain's structure.

Lardy also recommends including ionophores in the finishing ration to control lactic acidosis, bloat and some potential pathogens such as coccidia.

"Basically, these antibiotics keep cattle on feed," he says. "With barley, you want your cattle to eat small amounts more often so that the fermentation is kept on a more even state, and the feed efficiency remains up."