customers that could include California dairies, feedlots in Lethbridge, Alberta, or livestock producers in China. At some point, the feed manufacturing could become a business.

"Obviously, if we can ship it that far, we can get it to western North Dakota to the cow-calf producer or to the finishing feedlot where he can self-feed," Anderson says. "It's safe, very palatable and should promote good growth of our cattle that have exceptional genetics."

The two "primaries" in the feed products are wheat middlings, or "midds," and distiller's grains from ethanol and corn fraction production. There's also potential for canola meal, which has twice the protein of wheat midds and 1.5 times the protein of distiller's grains.

Feed recipes

To come up with a recipe, Anderson took the problem to the Northern Crops Institute in Fargo, Kim Koch, NCI's mill manager, created seven different feed recipes during the past two months, largely based on wheat midds.

"We were trying to establish a pellet that is durable — could be stored and shipped and maintain its integrity."

Each co-product by itself is not perfect. "By combining a couple of ingredients, we can improve the shelf life — the quality and the nutrient density — so we could afford to ship this product more economically."

Wheat middles content was tested from a low of 40 percent to 30 percent of the pellet content to up to 80 percent at the higher end of the range. The two recipes ing field peas. They make a good complement to the cattle feed pellet study because they produce:

- Increased feed intake: Anything fed peas by the researchers seemed to eat more, especially in creep-feeding and in "receiving diets" (the month or two after weaning) up to 700 to 800 pounds
- Improved feed efficiency: In finishing diets high in grains, the peas sometimes produce a decrease in feed intake, but gains stay the same. The gain per unit of feed improves. Peas are very digestible. Through digestion of the peas, the animal eats to satiation based on energy.
- Increased growth rate: Calves fed peas in creep feed in receiving will eat more and grow faster. Peas behave differently with cattle of different sizes and different rations. Forage-based, early feedlot period, cattle eats more on ration of peas and gain faster.
- Make more tender and juicy beef in finishing steers: Taste tests South Dakota State University in Brookings completed last summer indicate that if there's any propensity of meat from a cattle breed to be tough, peas will increase the tenderness.

The issue is important to Dakota Growers because of midseason price swings for wheat middles, which can range from a wintertime high in the $100-per-ton range to $35 in the summer. The distant goal is to devise feed products that can be put in empty shipping containers and sent to customers that could include California dairies, feedlots in Lethbridge, Alberta, or livestock producers in China.

At some point, the feed manufacturing could become a business.