

SYNOPTIC NEWS FROM ANIMAL & POULTRY SCIENCE

Combining APS Research News and Feed News

THIS ISSUE

In this issue of SNAPS highly respected feed specialists speak out.

They will discuss the challenges and opportunities generated by the recent market disruption caused by the identification of a single case of BSE in a Canadian herd. Each approaches the challenge from the platform of their own special expertise. Their individual perspectives will provide new ideas.

What we have learned from BSE

The market status and implications for producers

Dr. Red Williams, Professor Emeritus with the Department of Animal & Poultry Science, says the public response to the BSE crisis was very favorable. “The media remained focused and stressed the facts and reality of the situation. It was made very clear that this was always a ‘one-cow’ situation.”

He also notes that Canadian consumers responded beautifully. We openly supported the beef industry by consuming Canadian beef and greatly increasing our beef consumption. Williams feels that this support of our agricultural sector went a long way in encouraging beef producers who were hurting due to international market restrictions.

Williams believes that things should be back to normal by summer of 2004, except for one category: cattle over 30 months of age. These older animals yield manufacturing quality beef. In theory, these are the animals susceptible to exhibiting BSE and consequently the market may not open to them as quickly. It was found in Britain that BSE was rarely exhibited in an animal under 30 months, ipso facto, if you can't detect it isn't there. On average it takes about seven years



**C.M. (Red) Williams, OC, PhD,
FAIC, PAG**
President, SAC Inc.

for the abnormal prion to make its way from the small intestine where it crosses the wall of the digestive tract, up the spinal column to the brain; this occurs much faster in cervids. In fact, it is not that the cattle over 30 months are more susceptible but that they may exhibit the disease. This led to the rules under The Office International des Epizooties (OIE) of the World Health Organization which deals with endemic diseases such as BSE, which requires seven years without a case of BSE and eight years without feeding bone and meat meal for a country to regain the status to trade. By seven years it assumed that all aged animals will have cleared out of the population. OIE has developed rules for all livestock diseases, such as the BSE crisis in Canada.

Canada culls about 600,000 cows and bulls per year, many of which are sold to the States. “Right now we are prohibited from marketing



these older cows to the U.S. and we have a problem. Normally an old cow is worth about 40-60¢ per pound, now it's worth about 10¢ per pound if you can even find someone to take it. We don't normally have the capacity to handle all those animals. This is a complex problem. Producers are faced with feeding animals with little or no current value."

Williams believes that we have to run on a bit of faith and assume that the cattle market is going to re-organize itself early in the New Year. "The market will correct itself. I believe we will be shipping live steers and finished cattle by spring." He goes on to predict that there is going to be a shortage of finished beef in the early months of the 2004. How can that happen? Feedlot operators in Canada have been selling their cattle and not restocking to full capacity. Williams notes, "There is painful irony in the realization that as prices increase, we could be hauling in more dressed beef from the U.S."

Williams also issues a call for a change in international livestock disease management policies. Canada met all the requirements to reestablish open borders but was still prevented from selling. "We would like the OIE to establish a new set of regulations to handle the next similar crisis in a more rational manner," concludes Dr. Williams. We should have provisions to establish zones within the country to isolate a disease outbreak. See page 3, *The Canadian response to a BSE diagnosis*.

A Viable Response to Global Market Concerns

"I read this situation as an opportunity," states Dr. Williams firmly. "The world is changing with regard to

demands for higher levels of food safety, calls for improved environmental stewardship and increased concern for animal welfare. We can use this transition stage to our advantage. I believe that the consumer wants a high standard of performance and high quality meat products. If these demands are addressed and product is delivered in a timely fashion, the consumer is willing to pay."

"In Canada, beef is mainly produced in small herds. The producers are newly conscious of their vulnerability and of their potential isolation in the market as never before. The time is right to introduce change - producers are ready, the political players are ready, and the consumer is ready."

According to Williams the solution could be close-at-hand. He cites Saskatchewan as an example. "We are a province that knows how to work co-operatively. Let's use this experience to provide leadership. Let the farmer retain ownership throughout the system. We have all the tools needed to develop a list of protocols and to lay out a vertically integrated system that will put Saskatchewan in the lead in Canada and North America.

If we are to lead the way in global competition, we require a responsive system encompassing all aspects of beef production, processing and placement on the shelf. The process of delivering food from the producer to the consumer is very sophisticated and requires complex strategies to generate change within the entire line of production. If we are to accomplish this, there has to be a leadership team that incorporates knowledge of, and familiarity with, each link in the chain of delivery. We need people in the community and credible individuals in government to take charge and to act as change agents."

BACKGROUND

What is BSE?

Bovine spongiform encephalopathy (BSE) is a disease which affects the brain and neural systems of beef and dairy cattle. Although the root cause is not known the symptoms are triggered by the production of abnormal prions (proteins) in the brain and nerve tissue. Over time, the disease creates a random pattern of 'holes' in the brain tissue hence the use of the term spongiform. Once the abnormal prions are present the brain tissue deteriorates irreversibly. In most cases, the disease develops in about seven years in cattle.

BSE is part of a family of diseases classified as Transmissible Spongiform Encephalopathy (TSE). Certain types of these diseases may occur in humans and in ruminant meat animals, and others including mink.

Other forms of TSE are:

- *Creutzfeldt-Jacob Disease (CJD) which occurs very rarely in humans. It seems to arise spontaneously but may be transmitted in rare situations where brain tissue is eaten.*



- *vCJD is similar in reaction to CJD, and was the culprit in the epidemic in Britain. It can be transmitted between cattle consuming meat and bone meal, and to humans by consuming nerve tissue from infected cattle.*
- *Scrapie is the disease in sheep. It is very common around the world and is transmitted mainly from ewe to lamb.*
- *Chronic Wasting Disease (CWD) is found in the members of the deer family. It is transmitted through saliva; nose to nose touching is sufficient but recent reports explain that it also passes via feces and is long lasting in that form.*

BSE (Bovine Spongiform Encephalopathy) can be transmitted to cattle that have consumed infected meat and bone meal. Canada has prohibited the feeding of meat and bone meal derived from ruminants to bovines since 1997. The symptoms of BSE begin with anxiety and unusual fright. Then there are progressive changes to the locomotion resulting in an inability to stand or walk. The symptoms in all TSEs are similar in that they involve the nervous system but may be somewhat different in detail in different species. For example, sheep with scrapie develop an urge to rub their wool and eventually rub areas bare, before developing the typical locomotion problems. Symptoms of CWD in cervid (deer family) are more similar to BSE except they occur much sooner after infection.

Since May 20, 2003, when a single case of BSE was confirmed in Canada, the Canadian beef industry experienced

an unprecedented market crisis. The borders of some 30 countries were temporarily closed to trade in Canadian beef. This crisis extended to all aspects of the beef industry, from production to processing and all the services from trucking to feed production. The crisis has also affected other industries including sheep, goats, bison, elk, deer, but particularly swine and poultry.

The Canadian government response

The Canadian Food Inspection Agency (CFIA) carried out all the investigative procedures deemed necessary by a team of international experts:

- *traced and slaughtered all animals that had contact with the BSE infected cow;*
- *prohibited the feeding of meat and bone meal derived from ruminants to bovines (since 1997);*
- *removed and segregated head, neck, spinal column and parts of the small intestine from all mature slaughtered cattle.*

The Government of Saskatchewan provided \$20 million compensation to extend the initial federal program for feeders trapped by the closure of the US border and the slowdown in Canadian beef processing. The provincial government also has an open-ended loan guarantee in place to give beef producers the assurance that their government was behind the industry. This enabled producers to make individual adjustments in coping while the export market gradually opens.

PROFILE DR. RED WILLIAMS

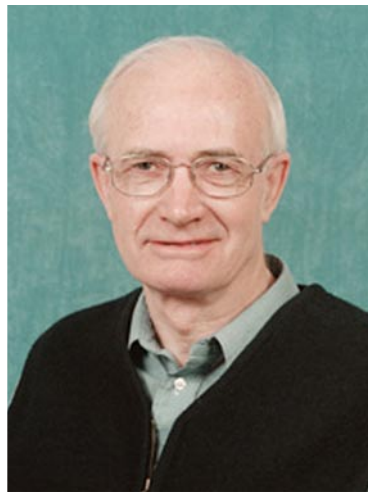
Since 1954 Dr. Red Williams has taught Agriculture and Veterinary Medicine as Professor of Animal Science and as an Extension Specialist. In addition to being an inspiring and award-winning teacher, he served on many University and provincial committees and boards. Williams is also a well-known public speaker and author.

Red Williams' early involvement in Animal Welfare issues led to the development of a Code of Ethics for Livestock and Poultry Production in Canada. In addition, he has been active in professional organizations, holding executive positions in the Canadian Society of Animal Science, the Saskatchewan Institute of Agrologists and the Agricultural Institute of Canada.

For his outstanding professional service and accomplishments, Williams was awarded a Member of The Order of Canada (1989); became a Fellow of the Agricultural Institute of Canada (1972); became an Honorary Life Member of the Canadian Extension Society (1970); received the Confederation Medal (1992), The Queen's Jubilee Medal (1979), Century Saskatoon - City of Saskatoon Scroll (1982) and most recently the Saskatchewan Order Of Merit (2002) for his outstanding contribution to the Province of Saskatchewan.



Effects of the BSE Crisis on the Western Canadian Dairy Industry



Dr. Dave Christensen

While the effects of BSE on the Canadian beef industry have received much attention, less has been said about effects on the dairy industry. According to dairy specialist Dr. David Christensen, Professor Emeritus in the U of S Animal and Poultry Science Department, continuing restrictions on live cattle imports by the US are causing trouble for the dairy industry and affiliated businesses. In the longer term, nevertheless, Christensen speculates that the fallout from the BSE crisis may have some positive spin-offs for at least some sectors of the prairie agricultural community.

The Present Situation

A number of Saskatchewan companies that specialize in exporting breeding stock have already seen their market, and thus their profits, vanish. Where last year a single exporter might have had several cattle liners per month heading south loaded with bred heifers and sound cull cows worth from \$800 to \$2000 per head, those same animals are now selling domestically for \$200 - when they can be sold at all. This is but the tip of the iceberg, in an industry where culling and breeding decisions have to be made a year ahead.

An annual cull of 25%, representing older cows, is normal. The breeding of 15-month heifers to replace culls must be done almost a year before they become producing cows. Producers have had to gamble throughout the summer on whether to delay breeding until they can see a market for their culls. At present, no export market exists for live cattle, and even meat from slaughtered culls would not meet the 30-month age limitation for the US market. Thus, dairy producers are faced with a grim choice: to hope for a re-opening of the market, keep their producing cows in production longer and retain their heifers as well while delaying breeding as long as possible, or dispose of their

surplus animals any way they can, to avoid the expense of feeding them over the winter.

If the first option is chosen and the border stays closed, financial problems are certain to multiply. Feeding a milking dairy cow for a year costs \$1,200-\$1,400. Keeping culls in production, even aside from bringing replacements into production as well, will inevitably exceed producers' milk quotas in a supply-managed industry. At the moment, over-quota production is still being accepted, as long as the dairy product market remains unsaturated. However, as of August 1, producers receive no direct return for over-quota production. The returns are placed in an industry-wide pool and shared among all producers in the western pool. The dumping of surplus milk remains a distinct possibility for the not-too-distant future, because international trade agreements limit Canadian dairy product exports to less than 5% of domestic consumption, and that isn't going to change any time soon.

A few producers have chosen the second option, making private arrangements with a local slaughter plant and attempting to market the meat locally. Others are contemplating killing at least some of their culls and disposing of the carcasses in landfills, rather than feeding them over winter. Many producers do not have sufficient feed or facilities to carry an expanded herd indefinitely in any case.

Consumer Prices

What does this bode for commodity prices? Christensen predicts that while consumers may be paying less for beef, they are likely to see the retail price of milk and other dairy products rise over the coming months. Because the industry operates under a supply-management regime, the Canadian



Dairy Commission and local Milk Control Boards will attempt to offset some of producers' increased expenses by raising prices, even if a milk surplus exists. Coupled with lower feed prices due to a good feed production season, this may be enough to see many producers through the next few months of uncertainty.

Longer-term Changes

In the longer term, a number of systemic changes are likely. Because the North American livestock market is highly integrated, any changes Canada makes will have to co-ordinate with the US industry. If Canada gets too far ahead of the US in regulation and control, there may well be a backlash among US producers who do not want to be perceived as negligent by their major export markets in the Far East. On the other hand, if Canada falls behind the US in regulatory standards, the borders are likely to remain closed to our livestock even after the BSE crisis subsides.

The use of animal products in livestock feeds will inevitably decrease, although US producers will not readily agree beef tallow is a potential problem, even when used in poultry or swine rations rather than in cattle feed. The use of blood meal in dairy rations will definitely decline, creating a niche for plant-based feed supplements high in lysine and methionine. While soybeans are currently the most economic source of these supplements, benefiting mainly US and Ontario feed producers (although Manitoba does have some soybean production, as does Quebec), a demonstrated potential exists for an extruded pea/canola blend using prairie crop production.

Potential Positive Spin-offs

Christensen believes, however, that market opportunities will also arise from the BSE crisis. He predicts a potential market for extruded pea/canola-based feed supplements to replace animal-based supplements, if prairie feed processors

and feed researchers collaborate on developing the product and bringing it to market at competitive prices.

As well, development of procedures for live-animal testing for certain genetic markers shows potential at the U of S, and could well serve as the prototype for large-scale live-animal BSE testing.

An indirect spin-off of the BSE crisis may be the hastening of Identity Preservation (IP) initiatives in the feed and livestock industries. As procedures are put in place to trace the history of feed sources, and offspring of individual animals in response to the BSE scare, these procedures may have positive spin-offs in other areas as well. Christensen notes in particular that the identified health benefits of conjugated linoleic acid (CLA) omega-3 fatty acids in human and animal diets will be good for the livestock industry, in that milk and beef fat are among the best animal sources of these substances. While current livestock feeding practices tend to reduce the production of CLA by rumen bacteria, which thrive best in pasture-fed rather than grain-fed animals, recent research has established that supplementing current dairy cattle diets with flax or canola can double the CLA content of milk. Dairy producers may be able to capture a significant niche market in CLA-enriched milk, using locally-produced feedstuffs, if they are willing to undertake an IP program to document their production.

In general, Christensen says, milk consumption is not likely to go down even if the price increases. Dairy producers may be able to milk cows longer and raise fewer replacement heifers, which may increase their costs of disposal of mature culls and reduce the price of calves. Some of the cost increases not passed on to consumers may be able to be recovered by improved efficiency of milk production through improved domestic feed ingredients, or by marketing specialized products such as high-CLA milk. Because the Canadian dairy industry has essentially opted out of the international market except for breeding stock, any changes in production will rely on Canadian consumers to determine their success.

PROFILE

The Department of Animal and Poultry Science celebrates the career of Dr. David Christensen and gratefully acknowledges his contribution to the generation of new knowledge in the Dairy Industry. Dr. Christensen remains with the Department as Professor Emeritus. He has a lifetime of achievement including exceptional national and international

DR. D. A. CHRISTENSEN

contributions in the areas of agriculture teaching, research, technology transfer and extension, industry and community development, and international agriculture development.

Christensen is a leading researcher in dairy nutrition and management at the University of Saskatchewan. He has published nearly 100 refereed scientific journal articles and



presented 44 major invited papers at national and international scientific conferences. Furthermore, he presented over 200 invited lectures at institutions all over the world.

For many years Christensen taught nutrition and dairy management to a large number of students, including undergraduate, graduate, vocational and veterinary students. Almost 50 graduate students completed a graduate degree under his supervision. Christensen's teaching provides students with a relevant blend of modern science, practical management and commercial applicability. He has a thorough understanding of agricultural systems, their vertical and horizontal integration, and their relation to rural economies and the environment.

Christensen's expertise is not limited to Canadian agriculture, as he has engaged in considerable international agriculture development in many countries in Africa, Central America, the Middle East, and Asia. These activities range from secondment to international universities, to international consulting work for the Canadian International Development Agency, the World Bank and private consulting agencies, to trade missions, to the training of many international graduate students. Christensen was recognized for his contributions in international agriculture through awards such as the prestigious International Animal Agriculture Award by the World Association for Animal Production, the Agriculture Institute of Canada International Recognition Award, and the J.W. George Ivany Internationalization Award at the University of Saskatchewan.

Christensen, through his research, has had a major impact on western Canadian agriculture. His accomplishments are extensive. Early in his career he helped establish the Saskatchewan Feed Testing Laboratory. This initiative brought

scientific nutrition information and ration formulation to the farm. In response to the enormous growth in the use of corn silage in eastern Canada and the USA, he developed whole crop cereal ensiling techniques and developed rations for dairy and beef cattle based on cereal silage, that were widely adopted in western Canada. Starting in 1977, Christensen was one of the first nutritionists to appreciate the extent and economic impact of trace mineral deficiencies in cattle in western Canada. Trace mineral supplementation is now widespread, primarily as the result of a ten-year research program led by Christensen. The dehydrated alfalfa industry in western Canada has developed markets and expanded production based on Christensen's research accomplishments and recommendations on the use of dehydrated alfalfa in ruminant rations. More recently, Christensen has been very active in the development of new, high-value feedstuffs based on Saskatchewan commodities for use on Canadian farms and for export. His research is critical to the development of new export markets for Saskatchewan feed products.

Throughout his career Christensen served the agriculture sectors on numerous boards as a member and in advisory capacities, including the Saskatchewan Dairy Association, Saskatchewan Livestock Association, Saskatchewan Advisory Committee on Animal Nutrition, Prairie Feed Resource Centre Inc. and the Canadian Society of Animal Science. Christensen is a member of many professional societies.

Christensen also carried out an 11-year term as Head of the Department of Animal and Poultry Science, University of Saskatchewan. Throughout his tenure as Head he maintained a strong research program, in addition to his heavy administrative and teaching duties.

Dr. Christensen has contributed greatly to agriculture not only in Saskatchewan and Canada, but also around the world.



New oat variety has potential

Recent work by Dr. Phil Thacker and Vern Racz has shown that the right type of feed can increase alpha linolenic fatty acid in pork fat approaching 13.5 per cent. Feeding trials carried out by Thacker with grower and finisher pigs compared a new variety of high-fat oat to a similar standard variety of oat.

He found that the new variety offers the potential of a higher return of energy per acre than traditional varieties and shows excellent feed potential. Typically oats have been considered a relatively high-fiber, low-energy feed with limited value in non-ruminant animals.

“So far we've seen that the high-fat oats support much better growth rates in pig production,” Thacker reports. He estimates growth performance is about 10 to 15 per cent higher due to better protein digestibility. As an added advantage, comparative carcass traits are not negatively affected.

The University of Saskatchewan's Crop Development Centre developed the high-fat oat variety used in this trial. Supplies of the new variety are limited, but commercial volumes should be available within the next two to three years.



Vern Racz,
Executive Director, PFRC

Feed News



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INTEGRATED SYSTEMS AND HIGH-VALUE ACTIVITIES: PROMISING APPROACHES TO GROWTH

Because of the clarion wake-up call of the single case of bovine spongiform encephalopathy (BSE), Canadians must renew efforts to create our own terms for production, marketing and processing. We can reflect on new ways to approach the cattle business and capture a healthy share of a high-value market.

Uncertainty in the cattle industry has created a challenge for feed processors and suppliers. Initially BSE has meant a reduction in sales of grain, particularly barley, and supplements. This effect on feed sales was compounded by the serious drop in the price of barley, later rescued by a dry year and limited harvest.

There is also great uncertainty in the overall agricultural industry marketplace. Producers have cut back and are doing things as cheaply as possible. This short-term fix will not serve the industry well in the long run. Knowing this, some producers have decided to change their approach, finding ways to create high-value market niches.

Although the commodity market is currently overloaded because of BSE, growth in niche markets is still possible. Through an industry-wide trace-back system and integrated production, producers can deliver high-value meat products. Feed producers can clearly demonstrate quality and characteristics, types of inputs, soil and environmental factors, and growing conditions through identity preservation. They can deliver a custom product with predetermined nutritional attributes.

Grocers will be able to trace meat's origins and trust the accountability of the production process. Using this system, retailers will also be able to select particular sources and animal types, a major advantage for product branding.

Concerned about their food, a growing portion of the consumer market is ready for trace-back. The consumers

want to know the food they eat is safe. They want a guarantee of reliable quality. They want specific features in the cuts of meat they prefer. They want health-enhancing characteristics in their food or specific cuts of meats.

The commodity market will always be there for those inclined to sell on a high-volume basis, but for those producers who wish to achieve consistent profitability over the long term, high-value specialty market sales are emerging as the most lucrative option.

The Prairie Feed Resource Centre (PFRC) knows it must play an active role in developing systems to allow leading producers entry into high-value markets. Domestic and export consumers in these markets are awaiting service and will respond favorably to the first producer providing the features they seek.

Agricultural systems

PFRC Board sees an integrated systems approach as a growth tool. A committee has been appointed to develop a feed production and processing system and a trace-back program to ensure a systematic and meaningful advancement of the industry. The committee, chaired by Vern Racz, PFRC director, includes key industry members: Roy Button, executive director of the Saskatchewan Canola Development Commission, Harvey Wagner, chair of the Saskatchewan Pork Research Committee and Dale Pulkinen of KAPT-AL Services Ltd. The committee also has good representation from government.

The Board believes this committee will play an important role in developing opportunities.

"The committee was struck to facilitate the adoption of the system by those who wish to move ahead," says Dale Pulkinen. "It is the vision of the Board not just to see losses minimized but to come out of the transition further ahead than we were before."



Roy Button believes both livestock producers and the feed industry can use this model to their advantage.

“The defined management system is not new and has been proven to be successful in many arenas,” Button says.

“For example, farmers who grow canola have the option to produce a variety that yields specialty oils. They grow under contract according to specifications set out by a company.

“In return the company pays a premium for compliance to their program of production. This offers the grower an expanded market for the oilseed as well as a guaranteed rate of return. The arrangement provides the company with a consistent product with reliable characteristics.”

Progressive leaders

PFRC members know the key to success for the feed industry is to develop co-operative vertical integration among livestock producers, feed producers and feedlots, and processors. Trace-back enables that cooperation through a transparent system and provides enhanced levels of consumer satisfaction.

“We have already made moves in the right direction.” says committee member Harvey Wagner. He cites the example of Ron Blazeiko of Saskatoon Specialty Meats Ltd. who uses a similar system in providing pork to the select Japanese market.

“Ron contracts producers to raise specific breeds under specified circumstances using a common standard of management. He has a slaughter plant that processes the meat which he has pre-sold to Japan.” says Wagner.

“He has captured this contract by creating an impeccable system that specifies every detail of production and monitors quality performance from all participants.”

Wagner goes on to give an example of market-responsive applied research conducted at Animal and Poultry Science in a combined effort with PFRC.

“There has been great concern over the use of animal byproducts in feed. The creation of a pea/canola feed blend delivers the combined benefits of oil for energy and protein from a non-animal source. Quality can be rigorously monitored and very specific traits can be incorporated in plant based products.”

This type of attention to detail helps to secure markets and build customer loyalty.

Vern Racz cites several successful models for developing and supporting high-end agricultural products, including PFRC research partners such as Saskatchewan-based Oleet

Processing, and Fahler Alfalfa located in the Peace River district of Alberta.

From its Regina headquarters, Oleet manufactures a high-protein and oil feed supplement for all species and classes of livestock through a unique extrusion process. This is a new technology and process adapted for North America.

Oleet Processing currently offers three main feed supplements:

- **ExtraPro** is a combination of legumes and canola, a source of energy and amino acids for high-producing cows, goats, swine, horses and poultry
- **LinPro** is a combination of legumes and flax, an immuno-stimulant feed supplement for healthier, more productive poultry, swine, cattle and horses
- **Equine Power 2000** is a combination of canola, oat hulls, flax and alfalfa, an excellent source of energy, protein, amino acids and oil easily digested by race, show and stabled horses.

Watch for future issues of SNAPS for more information on feed supplements and processing.

Racz says that PFRC and APS play a critical role in the move to capture the full value of feed products. The two organizations have much to offer through their product development research.

“We can be particularly effective in creating the high-value top end of the market, 15 to 20 per cent of which is open for specialty feeds and feed products,” says Racz.

“Take the example of barley as feed. We can retail it as a commodity or we can produce value-added hard white pork fat from that same product and be paid a superior price in the Asian market.”

He goes on to note the rich opportunities available to those who brave the risks and move to the leading edge of market niches.

APS and PFRC have played an important role in feed value enhancement that in some cases has led to the development of high-value designer foods like omega enriched eggs.

These products are created as a result of research into the use of flax in poultry diets.

Racz says, “Clearly the direction for the future has been established. Each time we are affected by the loss of a market or other disasters we are pushed to review our strategies. The only way we can be successful in future is to develop specialty products and responsive systems for high-value markets.”

Watch for future issues of SNAPS for articles on APS research into the use of flax in feed for fish, poultry, and swine.

