Animal Agriculture is Facing the Most Dramatic Change in Recent History: Are We Ready?

January 24, 2008

Francis L. Fluharty, Ph.D.
Department of Animal Sciences, The Ohio State University

Over the past fifty years, the beef industry in the United States has survived recessions, seen the diminishment of diversified family farms and an increase in large-scale operations surviving on the economies of scale, as well as consolidation in the pharmaceutical, feed, equipment, and meat packing and processing industries. We have adapted to these changes and relied more on science-based genetic, reproductive, and nutritional tools, as well as adopting innovative management, marketing, and risk management tools. In the past 20 years, we have become a member of the global economy, relying on meat exports, and imports to help sustain an economic balance in our industry. We are fortunate that we have had a producer funded check-off that has been critical to funding food safety and product development research which has given our domestic consumers an exceptionally safe, and much more diverse, choice of beef products, because our domestic demand for beef has been responsible for maintaining profitability since BSE was found in 2003 with the resulting loss of most of our high-value export markets as a result of having not kept pace with Australia, New Zealand, or Canada as major exporters of beef to Japan and the EU due to of our lack of an acceptable animal identification policy for trade purposes. Throughout this period, even during periods of high feed prices or regional droughts, we never have faced a combination of challenges that are as potentially long-ranging as those that are upon us today. At this point, you may be asking 'what challenges?' The two challenges facing animal agricultural in the immediate future are the loss of starch in animal diets, and the loss of land-based resources used for the production of feed for our animal industries.

Our national renewable energy policy is the primary reason for the challenges. On August 8, 2005, President Bush signed the Energy Policy Act of 2005 (H.R. 6) into law. The comprehensive energy legislation included a renewable fuels standard aimed at doubling the use of ethanol and biodiesel by 2012, and was backed by economic incentives. By all accounts, the Act was highly successful in increasing ethanol production. Keith Collins, Chief Economist for the USDA in testimony presented on January 10, 2007 before the U.S. Senate Committee on Agriculture, Nutrition, and Forestry, in 2006 that approximately 5 billion gallons of ethanol were produced in the U.S., which accounted for 20% of the 2006 corn crop (Source: http://www.usda.gov/oce/newsroom/congressional_testimony/Collins). However, the U.S. consumption of gasoline was near 140 billion gallons, so 20% of the corn crop was diverted to produce less than 5% of our gasoline. The Renewable Fuels Association, states that there are now 134 ethanol plants with a total production capacity of 7.2 billion gallons and another 77 ethanol plants under construction or expanding, with an additional production capacity estimated at 6.2 billion gallons (Source: http://www.ethanolrfa.org/industry/statistics/#C). It is estimated that the industry produced 6.5 billion gallons of ethanol in 2007, and projects ethanol production in 2008 to exceed nine billion gallons. (Source: http://www.ethanolrfa.org/objects/documents/1493/er261.pdf). Even with this production, the renewable fuels industry is nowhere near future production goals. On December 19, 2007, President Bush signed The Energy Independence and Security Act of 2007, which expands the Renewable Fuels Standard (RFS) by requiring 36 billion gallons of renewable fuel be used

annually by 2022, and the legislation requires 21 billion gallons of that goal must come from advanced biofuels including cellulosic ethanol (Source: http://www.ethanolrfa.org/).

"Corn ethanol use is mandated to grow from 9 billion gallons this year to 13.2 billion gallons in 2012 and to 15 billion gallons in 2015. Accounting for the distillers grain that replaces the corn that is used to produce ethanol, and the expected growth in average yields, this level of production will require 16.2, 23.2, and 25.5 million acres of corn, respectively, to be devoted solely to ethanol production. The required level of corn production will occur, but only if farmers are compensated through high prices" according to Bruce Babcock, Director of the Center for Agricultural and Rural Development at Iowa State University (Source: http://www.card.iastate.edu/iowa_ag_review/winter_08/article1.aspx).

A weak dollar is another reason for the challenges facing animal agriculture. Chad Hart, an Agricultural Economist at Iowa State University reports that "the latest USDA projections put corn exports for the 2007/08 marketing year at 2.45 billion bushels" making this year the largest corn exporting year in history, and explains that the primary reason for the export situation is that between January 1, 2007 and January 1, 2008, the U.S. dollar lost 15% of its value compared with the Brazilian real and 6% of its value compared with the Chinese yuan, the currencies of two of our major corn exporting competitors. Additionally, during this same time period, the U.S. dollar lost 6% of its value compared with the Japanese yen, making U.S. corn a very inexpensive import compared with Brazilian or Chinese corn (Source: http://www.card.iastate.edu/iowa_ag_review/winter_08/article4.aspx).

I am concerned about the long-term impact that our renewable energy policy will have on animal agriculture in the United States, as well as the impact on the protein nutrition of the human population on low, fixed incomes as meat protein products become more expensive. I also have several environmental concerns. The removal of starch from animal diets has already significantly increased feed costs, and as future legislated levels of ethanol are produced, food animal agriculture will be altered significantly. When distillers co-products are fed to animals, they can result in higher levels of dietary nitrogen (N), phosphorus (P), and sulfur (S) than when corn grain is fed. This occurs due to the removal of starch to produce ethanol and the resulting concentration of other constituents of the grain. At relatively low levels of diet inclusion, these factors can be dealt with. However, if the removal of corn starch from animal diets to the ethanol industry continues, animal agriculture will be negatively impacted, because there are physiological upper limits beyond which these co-product feeds cannot be used to replace corn grain. Furthermore, environmental concerns can become an issue at levels of diet inclusion much lower than those that cause toxicity to the animal as these minerals are excreted when fed in excess of what the animal can absorb. As more cattle are fed in the Midwest, near ethanol plants, there will be a continual increase in the amount of N, P, and S concentrated in the manure and urine, as 1 pound of distillers co-products contain the minerals of 3 to 4 pounds of corn. Environmental responsibility is a key component of livestock operations, and excess nitrogen and phosphorus in manure can have severe consequences on an animal feeding operation's nutrient management plan. If nearly closed-loop waste handling systems, such as anaerobic digesters, are not used extensively, there could be severe environmental impacts on water resources.

The movement of corn from the swine and poultry industries into ethanol production has potentially devastating implications for those industries, because they cannot feed high levels of distillers grains. Therefore, the cost of production in those industries has already increased, and will continue to increase, and profitability may decline to the point of continual losses. As more demand for corn continues, there will be a huge incentive to move a portion of the nearly 37 million acres currently in the Conservation Reserve Program (CRP) into row crop production. This has major implications for the CRP acreage, as well as for other marginal land areas, better suited to forage production due to runoff and high erosion potential. Finally, the movement to cellulosic ethanol brings up the potential for more wind erosion as ground cover is removed in the fall. The potentially huge unknown is the extent to which grasslands currently used for cattle grazing and hay production will be transferred to forage production exclusively for cellulosic ethanol feedstock production. We are being faced with challenges that we haven't even started to consider, but not planning for the future will be devastating. We need to better manage our pasture resources, develop and implement nutrient management plans; develop technologies and products, or product combinations, which maximize the digestibility of feedstuffs and optimize an animals immunity; develop technologies to bind excess minerals in the feed or in the rumen; and do a better job of matching beef genetics with a known outcome potential to specific feeding programs for specific consumer groups.

In summary, our current renewable fuels policy is based on ethanol. However, the levels of ethanol being produced now, and for the near future, are not a replacement for gasoline, but for the fuel additive MTBE. It is reasonable to question the long-term true cost of our current renewable fuels policy ultimately will be, as the price of meat protein products and the nutritional status of the poor and the elderly on fixed incomes may be impacted. The percentage of food expenditures by families and individuals as a share of disposable personal income has steadily declined since 1929 when it was 23.4% to 9.9% in 2006 (Source: http://www.ers.usda.gov/briefing/CPIFoodAndExpenditures/Data/table7.htm). One of the greatest benefits of living in the United States is that we spend a much lower percentage of our disposable income on food than is spent on food in other countries. Our ability to have a domestically produced, economical food supply that is safe and nutritious allows us to have enough of our income left to purchase the other goods and services that we have come to expect. It also helps assure that the majority of our young people and our elderly have the nutrition required to develop, grow, and remain healthy. Altering the infrastructure of agriculture through legislatively-mandated production levels of ethanol has the capability to alter the supply and demand infrastructure of agricultural inputs and outputs, and this has the potential to have long-ranging unintended consequences.

The current situation makes me think of the history lessons I learned in high-school: The Seven Sages of Greece (620 BC to 550 BC) had two mottos that seem appropriate today: 'Nothing in Excess' by Solon of Athens, and Forethought in All Things' by Periander of Corinth.