



## Living with Hogs in Rural Iowa

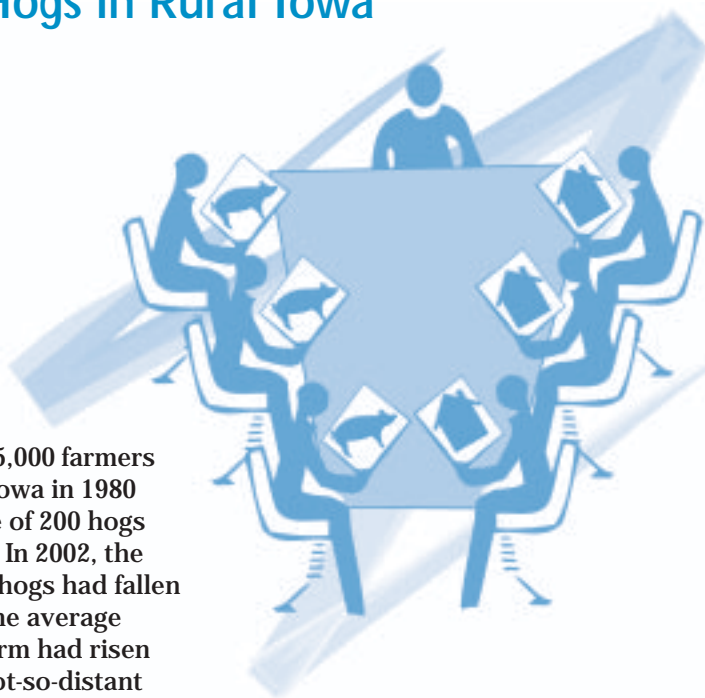
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Approximately 65,000 farmers raised hogs in Iowa in 1980 with an average of 200 hogs residing on each farm. In 2002, the number of farms with hogs had fallen to about 10,000, and the average number of hogs per farm had risen to over 1,400. In the not-so-distant past, the presence of livestock on farms was the social norm. When living or traveling in rural areas, you would expect to smell the smells, hear the noises, and see the sights that accompany such operations. Rural neighbors registered few complaints when nearly everyone had livestock. But the dramatic increase in the concentration of ownership now means that far fewer rural residents have a large financial interest in livestock. What once was the smell of money is now the smell of somebody else's money.

Complaints and lawsuits about livestock operations are now much more common. The best known case involves the four farm couples—two of which had raised livestock—who sued Iowa Select Farms in 2002 for the production of offensive odors, noxious gasses, and excessive flies on the company's 30,000 head hog facility in Sac County, Iowa. The plaintiffs were awarded \$1.06 million in actual damages plus \$32 million in punitive damages.



Lawsuits are a costly means of settling disputes. But many residents feel that they have no alternative because state law largely controls the siting of livestock operations. Currently, livestock producers have the right to construct facilities that meet state environmental standards. Supporters of state control argue that making Iowa a location that consistently applies standards for siting livestock facilities makes economic sense because livestock production is one of the industries for which Iowa has a competitive advantage.

Opponents of state control argue that increased local control of livestock operations makes sense because local governments are in a better position to gauge the local costs and benefits of local economic activities. Many feel, however, that, at least for hogs, modern feedlots in Iowa offer few local benefits. Sow facilities generate far more economic activity than do finishing operations. Increasingly, Iowa is becoming home to finishing operations, while the

large sow facilities are locating in North Carolina, Missouri, and Canada. And concentrated ownership of finishing operations means more central purchasing of feed, veterinary services, and other supplies. Central purchasing helps larger commercial centers but not necessarily smaller communities.

Thus, the benefits associated with increased economic activity from livestock production flow to larger commercial areas, and to the state as a whole, whereas the costs from odor, flies, and the risk of water contamination are borne locally. Clearly, under these circumstances, more local control would mean more restrictions. The difficult question that Iowa must address is, How can a competitive livestock industry be supported while accounting for local costs?

### REGULATION THROUGH ASSIGNED PROPERTY RIGHTS

Suppose that a hog farmer wants to build three new finishing houses on a site. The farmer knows that the hogs will generate a significant amount of odor intermittently throughout the year. This odor will affect the residents of four nearby families. Under current law, as long as all state environmental requirements are met, the farmer can build the facility. To some this means that current state law assigns this hog farmer the right to generate odor. But suppose state law gave the four families the right to be free of odor?

Initially you might think that such a proposal would bring a halt to any expansion in the hog industry, as residents would veto any new construction. But is this necessarily the case? A right to be free of odor can be considered a property right, in which the property is odor-free air rather than real estate. Just as real estate can be traded, so too



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## IN THIS ISSUE

Living with Hogs in Rural Iowa .... 1

Antibiotics Restrictions:  
Taking Stock of Denmark's  
Experience ..... 4

Iowa's Agricultural Situation ..... 6

Integration in the North  
American Livestock and  
Meat Industries ..... 8

U.S. Agriculture and the  
Value of the Dollar ..... 10

And the Survey Said. . . . . 11

Recent CARD Publications ..... 12

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could the right to odor-free air. Is it possible that private negotiations between the hog farmer and rural residents could result in a solution where everybody is better off?

Suppose that at this location, the hog farmer expects to generate profits equal to \$10,000 per year from the operation, after accounting for all costs of building and operating the facility. A payment to the residents of anything less than \$10,000 per year would leave this farmer better off than if the project were blocked. Economists call this \$10,000 the farmer's maximum willingness to pay to be able to build this facility. Further, suppose that each of the four families would accept nothing less than \$1,000 each per year as compensation for having to breathe hog odors. Economists call this \$1,000 payment the minimum willingness to accept the odor.

There is room for mutually beneficial trade when the willingness to pay exceeds the willingness to accept, as is the case in the example. Suppose the hog farmer offered each family \$1,500 per year as compensation for the odor. The farmer's profit would decrease by \$6,000 but would still be positive. Each family would have \$500 per year over and above the actual amount of harm caused by the odor.

Note also that giving families the right to be odor free encourages the farmer to invest in cost-effective practices that eliminate odor. Suppose that an investment of \$3,000 per year would eliminate odor. The farmer would have an incentive to make this investment because it would be less than the \$6,000 paid to the families as compensation for the odor.

This beneficial solution follows from the assignment of a property right to the rural residents. But the property right also could be assigned to the hog farmer. Suppose the hog farmer has the right to generate odor. The farmer would have no immediate incentive to compensate the odor-affected families, but the families would have an incentive to induce

the farmer to adopt odor-reducing technologies. If the odor generates \$4,000 in damages and costs \$3,000 to eliminate, then there is room for mutually beneficial trade to take place. In this case the payments would go to the farmer from the residents. Again, the assignment of property rights is the key to reaching an agreement.

### THE MAGNITUDE OF DAMAGES

Is there room for beneficial trades that could help solve the problem of locating livestock facilities in Iowa? There is unless the damages caused by proximity to livestock operations are much greater than the profits generated by such activity. How can we measure such damages? There is no market price for hog odor, so we cannot look at market reports. Surveys that ask residents how much they would be willing to pay to be free of hog odor would be a poor basis on which to base damage estimates. What is needed is a measure that is based on actual transactions between individuals—such as residential real estate transactions.

If odor causes damage, then one would expect that, all other things being equal, a house that is exposed to odor would sell for less than a house that is not. Therefore, measuring the impact of odor on property values should yield the needed damage estimates. We do not have a measure of odor at each property. Instead, we created a proxy measure of odor exposure by calculating the number, distance, and direction of feedlots relative to residential properties that have sold.

We obtained data for every rural residential house sold in Webster, Humboldt, Hamilton, Franklin, and Hardin counties from the mid-1990s until the summer of 2002. Along with the actual sale price for each home, we collected information on those attributes that typically affect a home's value, such as the square feet of living space, number of bedrooms, and proximity to schools and commercial centers. Finally, we used Department of Natural Resources data

on the location and size of livestock operations requiring either an operating permit or a manure management plan to determine how close each home was to each of these livestock facilities. For each house, we identified the nearest livestock operation, recording the operation's distance from the house, its size (live weight), and whether it was upwind of the home during the winter (that is, northwest) or summer (that is, south) seasons. We also computed the number of operations within a three- and ten-mile radius. We then determined (using regression techniques) if there is a statistically significant effect of proximity of livestock operations on property values, and if so, the magnitude of the effect. Only owner-occupied, single-family detached residences were included in the study. Details of the analysis are contained in CARD Working Paper 03-WP 342 (available at <<http://www.card.iastate.edu>>).

There is an important qualification to report about the results of this study. The statistical techniques used to estimate these results give insights into the average effects, not the effects on any particular residence. The actual affects will be higher or lower, depending on the type of facility, the type of livestock located in the facility, how well the facility is managed, topographical features of the site, and other factors that are not explicitly included in our statistical analysis.

#### RESULTS OF CARD'S ANALYSIS

Reasonable results emerge from our analysis. Overall, the data suggest that livestock facilities can affect property values. The closer the facility is to a residence, the greater the effect. And the effect is zero unless the residence is downwind of the closest facility.

We can best illustrate the magnitude of the effects by posing the following scenario. Suppose a residence has a three-mile buffer zone with no livestock facilities. Our results indicate that if one facility with 450,000 lbs live weight of livestock moved to within one-half mile, the value of the residence would decline by an average of 8 percent if the facility were located to the

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*Our results suggest that there may be significant room for beneficial trade between livestock farmers and homeowners.*

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northwest and by 5 percent if the facility were located to the south. These declines in average property values increase to 11 percent and 7 percent if the facility were located within one-quarter mile. At a distance of 1.5 miles, the declines fall to 3 percent and 2 percent.

The large amount of variation in the data hampers our ability to measure precisely the effects of livestock facilities on property values. However, it is somewhat reassuring that our average results are about the same as those of a previous study conducted in North Carolina by Palmquist, Roka, and Vukina ("Hog Operations, Environmental Effects, and Residential Property Values," *Land Economics*, vol. 73, February 1997, pp. 114-124). In this earlier study, the results indicated that rural residential property values declined by as much as 9 percent because of the siting of hog facilities within one-half mile of a residence.

#### A POSSIBLE TRADE-OFF?

With these potential property damages in mind, would a policy that gives existing homeowners the right to be free of damage from livestock operations put a stop to all facility construction? Our results suggest that there may be significant room for beneficial trade between livestock farmers and homeowners.

Suppose that a farmer wants to locate a site a half mile upwind from two residences valued at \$100,000 each and that there are no other facilities located in the area. The farmer is a good neighbor and promises to manage the operation to minimize odor, flies, and the risk of a manure spill. But the realities of livestock production in this case impinge on the owners of the residences. Given the right to be free of any effect from livestock operations, the homeowners would be able to block construction of the facility. But suppose the farmer offers each homeowner a one-time payment of \$10,000 (10 percent of the value of the home) as compensation for any potential damages. The homeowners might well choose to take the money and live with the livestock. The farmer would then be able to construct the facility at the chosen site, at a modest increase in construction costs. And the state of Iowa would get the benefits of attracting a competitive industry.

Exact rules and legal obligations would have to be worked out before any compensation program could be implemented. However, given the current stalemate, whereby homeowners feel powerless to affect land use decisions and livestock producers feel that their investments are not welcome in the state, the payoff from such voluntary agreements could be large. ♦

## Antibiotics Restrictions: Taking Stock of Denmark's Experience

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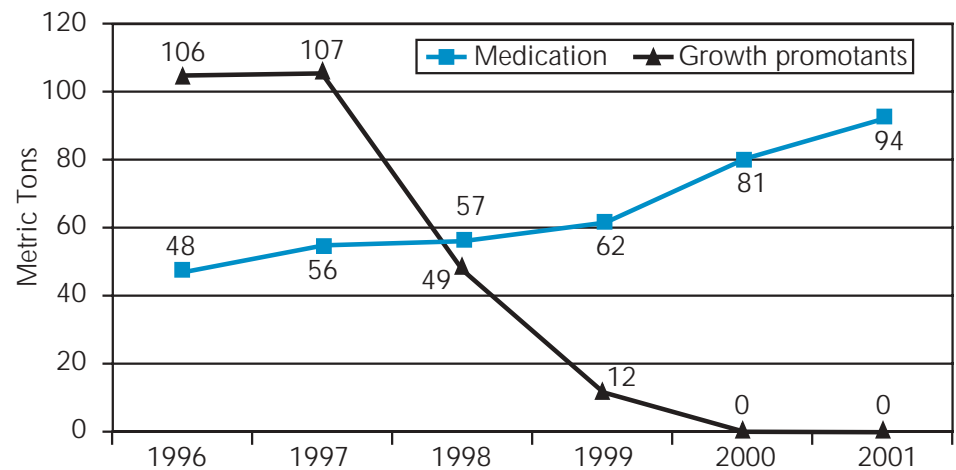
In June of 2003, McDonald's Corporation announced that it would prohibit its direct suppliers from using antibiotics that are important in human medicine as growth promotants in food animals after 2004. The company also created a purchasing preference for companies that work to minimize antibiotic use. This announcement, coupled with recent Food and Drug Administration guidance on the same issue, will put pressure on the U.S. livestock industry to consider alternatives to feed-grade antibiotics. Denmark recently banned the use of feed-grade antibiotics in pork production and has been joined in this action by countries in the European Union. We traveled to Denmark last summer to talk to Danish veterinarians, farmers, economists, and industry analysts about how the ban was implemented and how the Danish pork industry responded to the changes. What we learned about the economic impact of the ban, as well as the effects on total antibiotic consumption, provides evidence of the likely economic impacts of a similar ban for the U.S. pork industry.

### DENMARK'S VOLUNTARY BAN

Denmark's pork industry is at least as sophisticated as that of the United States, with an export-oriented and market-driven production system. It is therefore a suitable market for evaluating a ban on antibiotic growth promotants (AGPs).

The Danish government instituted a voluntary ban on the use of AGPs in pork production at the finishing stage in 1998 (accompanied by a penalty tax for use). On January

**FIGURE 1. TOTAL CONSUMPTION OF ANTIBIOTICS IN DENMARK (MT OF ACTIVE INGREDIENTS)**



Source: DANMAP 2000 (Danish Veterinary Institute 2001); DANMAP 2001 (Danish Veterinary Institute 2002).

1, 2000, it banned AGPs at both the weaning and finishing stages.

As shown in Figure 1 (based on data from *DANMAP 2001*, published by the Danish Veterinary Institute in July 2002), Denmark's total consumption of antibiotics in pork production was 152 metric tons (mt) of active ingredient in 1996, 106 mt of AGPs, and 48 mt of therapeutic use as medication. By 1998 when antibiotics were banned from use at the finishing stage, the total use was 106 mt. The use of growth promotants fell by about 50 percent (from 107 mt to 49 mt) and therapeutic use remained about constant. By 1999, overall antibiotic use fell to a low of 74 mt.

The effective ban of AGPs at the finishing stage in 1998 was accomplished through a tax and some pressure to discontinue the use of subtherapeutic antibiotics. Faced with a tax of \$2.00 per pig, most producers stopped using the products at the finishing stage.

Farmers reported very few health problems in their herds, a result that indicates that most of the benefits of AGP use at the finishing stage were driven by a growth-promoting effect plus a small reduction

in mortality. The Danes viewed the ban at the finishing stage as a resounding success. Total antibiotic use was cut by more than 50 percent, and very few health problems were encountered.

The ban at the weaning stage in 2000 was much more difficult for farmers; they reported some significant health problems, especially in the early stages of pig production. Producers responded by restricting feed for the first two weeks. As problems of piglet mortality and disease mounted, veterinarians became more dependent on the use of therapeutic antibiotics. As a result, although the use of AGPs fell to nearly zero in 2000, the use of antibiotics as therapeutic medications increased. Therapeutic medications were increasingly substituted for the now-banned AGPs. Thus, the consumption of total antibiotics increased from 74 mt in 1999 to 81 mt in 2000 and to 94 mt in 2001. Despite this increase, the overall level of antibiotic use in 2001 was still limited to about 60 percent of the level used in 1996 before the ban at the finishing stage. On a per pig basis, the level in 2001 was estimated

to be 3.0 grams per pig, down from earlier levels (*DANMAP 2001*, Danish Veterinary Institute, July 2002).

Most of the pig health problems experienced after the ban were described as problems with post-weaning diarrhea and also some diarrhea at the finishing stage. The Danish producers and veterinarians we spoke with reported that the pigs were weaker and more vulnerable to disease when they were moved to the finishing barns. The Danish experience suggests that reduced use of antibiotics at the weaning stage has had significant animal health effects throughout the production system.

### COST IMPACTS AND U.S. ESTIMATES

Based on what we learned in Denmark and on an earlier publication that measured the costs associated with a previous Swedish ban, we calculated the components of the cost of the ban. These costs include pre-weaning costs of \$1.25 per animal, a 1.5 percent decrease in post-weaning feed efficiency, an increase of fattening-finish mortality of 0.04 percentage points, a decrease in sow productivity by 4.82 percent, an increase in veterinary and therapeutic costs (net of the AGP cost) of \$0.25 per pig, and a \$0.75 cost per pig for new vaccines.

In addition, we included sort-loss costs of \$0.64 per animal because of increased variability of weights expected with the move away from AGPs and the penalty packers place on the lighter-weight pigs. We also incorporated capital costs of \$63 million for the additional space needed for the extra five days post-weaning, and we included \$166 million for the additional sow space.

Our best estimate is that costs would increase by approximately \$4.50 per animal in the first year. We estimate the total cost of a ban to the U.S. pork industry spread across a ten-year period to be in excess of

\$700 million. The expected cost to consumers is an approximate 2 percent increase in retail prices.

The estimated first-year impact of \$4.50 per head due to the effects of a ban on AGPs represents a production cost increase of approximately 4.5 percent. This cost increases slightly as more buildings are required in subsequent years and there are fewer animals but the same fixed costs. Comparable estimates of other studies suggest that the costs are likely to range from \$3.00 to \$4.50 per pig.

### LIKELY EFFECTS FOR THE U.S. PORK INDUSTRY

With increased costs and declines in production, it is likely that some producers would be forced out of business. However, a lower level of production increases wholesale and retail prices, and higher prices help offset some of the cost increases. The profit impact is greatest in year one. By year two, the consumer is paying for most of the cost increase, and producer profits would fall. The end result is a slightly smaller U.S. pork industry, as slightly higher retail prices would lead to lower consumption. The productivity decline associated with the ban would be recovered by normal technological advances, but the dollars lost to individual producers during the adjustment phase would not be recovered.

One important lesson from the Danish experience is that there is wide variation in the effects incurred among producers. Our results show the economic impacts of a ban on an “average” or “representative” farm. These results mask wide differences across farms, and we did not include these distributional effects in the model.

The Danish experience clearly illustrates the differences between the effects of a ban at the weaning stage and one implemented at the finishing stage. The Danes achieved a large reduction in antibiotic use,

and producers encountered few costs when they banned at the finishing stage. However, when they imposed a ban at the weaning stage, they encountered increased post-weaning health problems leading to increased medication and other costs. In general, the Danes achieved 80 percent of the benefits for 20 percent of the costs when they imposed a partial ban, and they encountered 20 percent of the benefits and 80 percent of the costs when they extended the ban.

Faced with similar problems, U.S. veterinarians would likely resort to greater use of therapeutic antibiotics, and the total use of antibiotics could rise, much as has happened in Denmark in the period immediately after the ban at the weaning stage.

The economic impact of a U.S. ban largely would depend on the willingness of U.S. veterinarians to increase therapeutic use, and the analysis assumes some increase in veterinary costs and vaccines. Recent experience in the United Kingdom indicates that the costs and management of eliminating use of subtherapeutic antibiotics are significant. Under agreements with retailers, U.K. producers eliminated AGPs in poultry production in 2000. Now, faced with significant problems of disease and diarrhea in their flocks, they are reintroducing antibiotics to prevent disease. Currently, total antibiotic use has dropped, but AGP use may increase as producers try to manage animal health concerns.

### FOR MORE INFORMATION

See the full report, “Lessons from the Danish Ban on Feed-Grade Antibiotics,” CARD Briefing Paper 03-BP 41, at the CARD website: [http://www.card.iastate.edu/html/pub\\_id=84&c=1&synopsis=1](http://www.card.iastate.edu/html/pub_id=84&c=1&synopsis=1). ♦

# Iowa's Agricultural Situation

*Crop projections increase, national hog inventory declines*

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## CROP PROGRESS

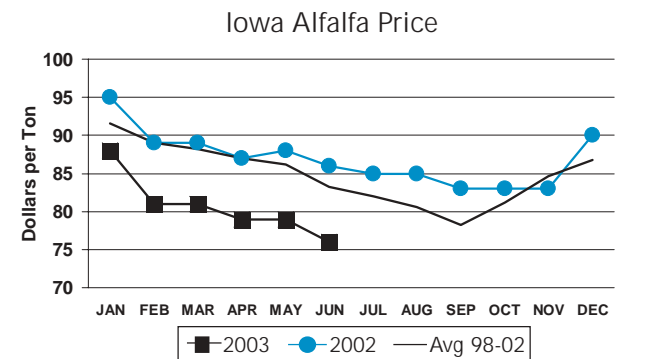
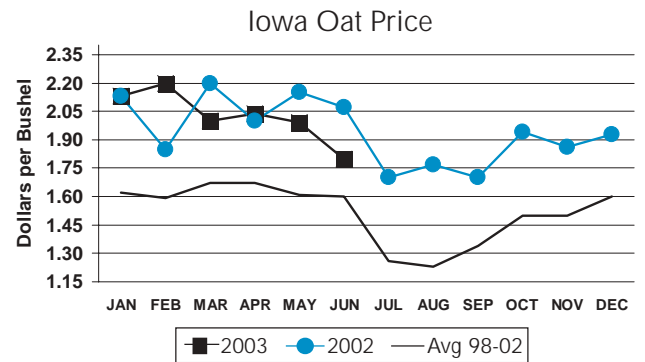
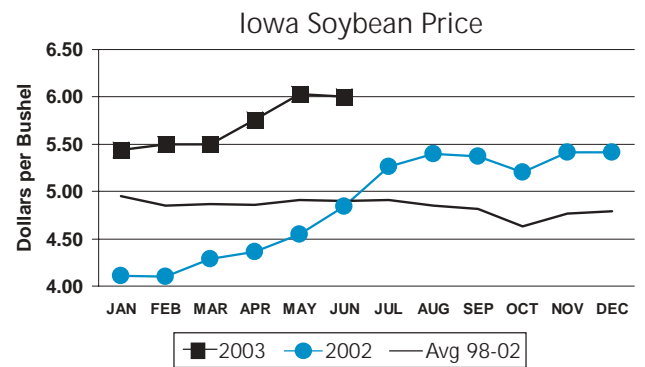
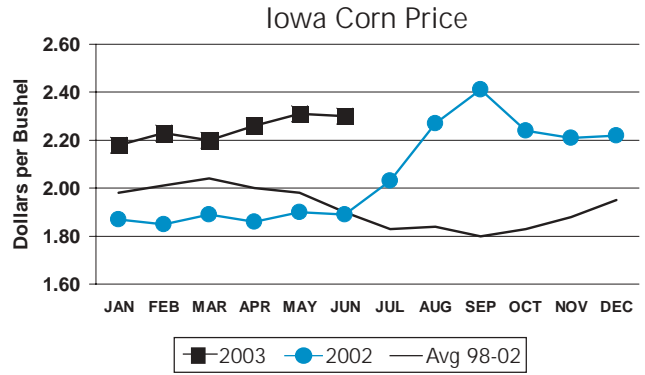
Current weather forecasts and crop condition reports indicate that bumper crops likely will fill the bins this fall. The July U.S. Department of Agriculture (USDA) *World Agricultural Supply and Demand Estimates* report raised its estimates of 2003-04 U.S. corn production by 210 million bushels from last month's projections, to 10.27 billion bushels, as current crop conditions and forecasts indicate higher prospective yields than the trend yields used in the previous estimates. USDA also raised the projected U.S. soybean production to 2.89 billion bushels, up 30 million bushels from June's estimates.

Contrary to earlier trade expectations that some producers would shift from corn to soybeans, or that the acreages of both crops would fall because of adverse weather early in the planting season, the June USDA *Acreage* report raised acreage projections for both crops. Farmers increased corn and soybean plantings by 44,000 and 471,000 acres, respectively, from their March intentions. No anticipated loss of acres or abandonment materialized, and farmers in the eastern Corn Belt increased corn plantings to compensate for last year's poor crop.

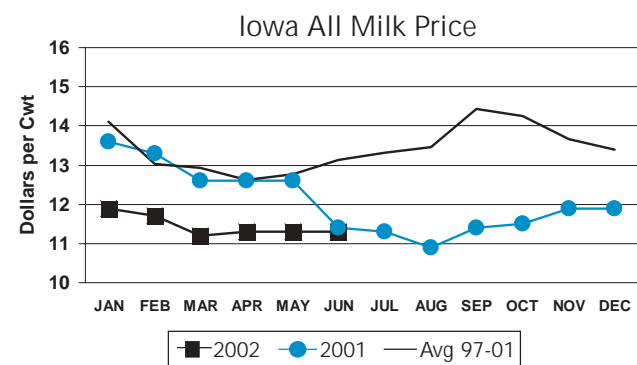
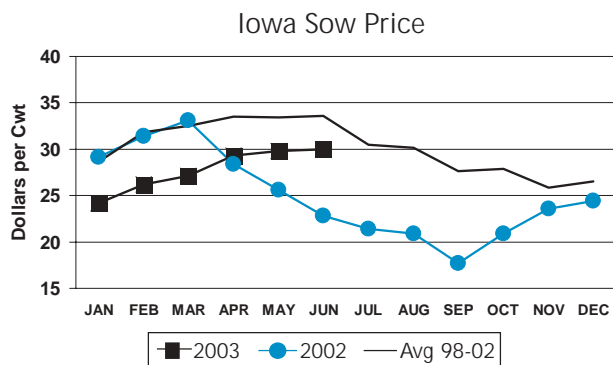
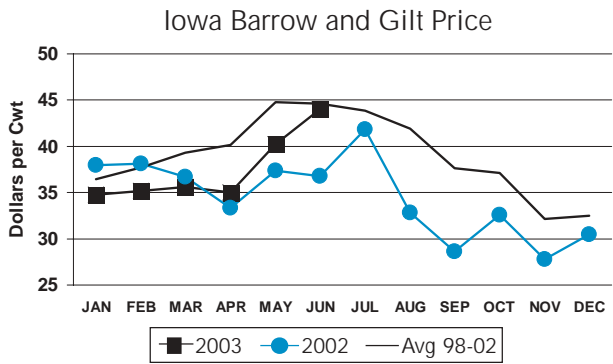
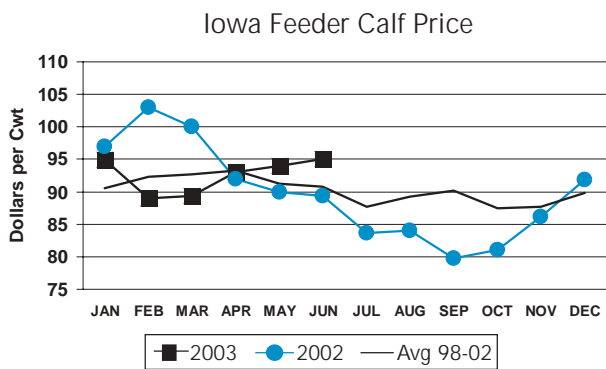
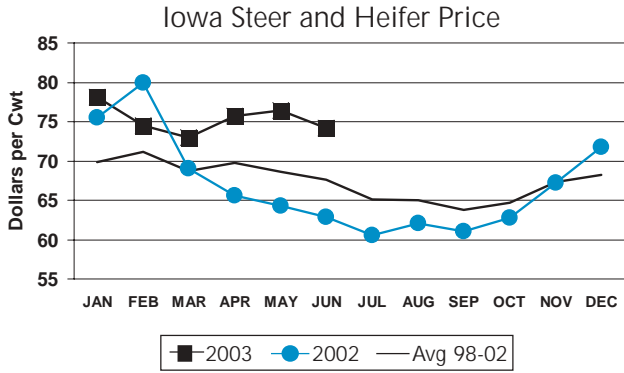
While 79 million acres planted to corn is similar to last year's level, USDA raised the projections of acres harvested for grain to 72 million acres, up 4 percent from 2002. In spite of the timely corn planting and favorable weather conditions in early April, subsequent cold temperatures and precipitation kept the planting pace slightly behind normal, with 95 percent of corn plantings completed by June 1. As of June 22, 73 percent of the U.S. crop was rated good to excellent, up 11 percentage points from this time last year, and up 5 percent from three weeks earlier as warmer, drier weather allowed conditions to improve.

USDA estimates the 2003 soybean planted area at 73.7 million acres, slightly less than last year and possibly the lowest planted area since 1998. The survey indicates that 72.7 million acres will be harvested, up 1 percent from 2002. Soybean planting proceeded somewhat behind schedule, with 94 percent of the crop planted by June 23, which is 2 percent below normal. The share of soybean crop rated good to excellent in 18 major soybean-growing states was stable and remained at 70 percent at the beginning of July.

In Iowa, as of June 14, corn acreage accounted for 12.4 million acres, up 1 percent from last year. Soybean plantings of 10.4 million acres are similar to a year ago. Estimates of corn planted to genetically modified varieties are at 45 percent of the state crop, 2 percent less than intended in March but 5 percent above the national level. Iowa producers planted 84 per-



*continued on page 9*



## Iowa Cash Receipts Jan. – Sept.

|                   | 2003  | 2002 | 2001  |
|-------------------|-------|------|-------|
| (Million Dollars) |       |      |       |
| Crops             | 741   | 575  | 707   |
| Livestock         | 463   | 418  | 438   |
| Total             | 1,204 | 993  | 1,145 |

## World Stocks-to-Use Ratios

|           | Crop Year                    |                       |                     |
|-----------|------------------------------|-----------------------|---------------------|
|           | 2003/04<br>(July Projection) | 2002/03<br>(Estimate) | 2001/02<br>(Actual) |
| (Percent) |                              |                       |                     |
| Corn      | 13.43                        | 15.35                 | 20.64               |
| Soybeans  | 19.61                        | 18.13                 | 17.41               |
| Wheat     | 24.02                        | 27.49                 | 33.72               |

## Average Farm Prices Received by Iowa Farmers

|                  | June*<br>2003 | May<br>2003 | June<br>2002 |
|------------------|---------------|-------------|--------------|
| (\$/Bushel)      |               |             |              |
| Corn             | 2.30          | 2.31        | 1.89         |
| Soybeans         | 6.00          | 6.03        | 4.84         |
| Oats             | 1.80          | 1.99        | 2.07         |
| (\$/Ton)         |               |             |              |
| Alfalfa          | 76.00         | 79.00       | 86.00        |
| All Hay          | 74.00         | 79.00       | 83.00        |
| (\$/Cwt.)        |               |             |              |
| Steers & Heifers | 74.20         | 76.40       | 62.90        |
| Feeder Calves    | 95.00         | 94.00       | 89.30        |
| Cows             | 42.00         | 42.20       | 40.10        |
| Barrows & Gilts  | 44.00         | 40.20       | 36.80        |
| Sows             | 30.00         | 29.80       | 22.80        |
| Sheep            |               | 32.70       | 22.60        |
| Lambs            |               | 93.90       | 77.70        |
| (\$/Dozen)       |               |             |              |
| Eggs             | 0.45          | 0.32        | 0.35         |
| (\$/Cwt.)        |               |             |              |
| All Milk         | 11.30         | 11.30       | 11.40        |

\*Mid-month

# Integration in the North American Livestock and Meat Industries

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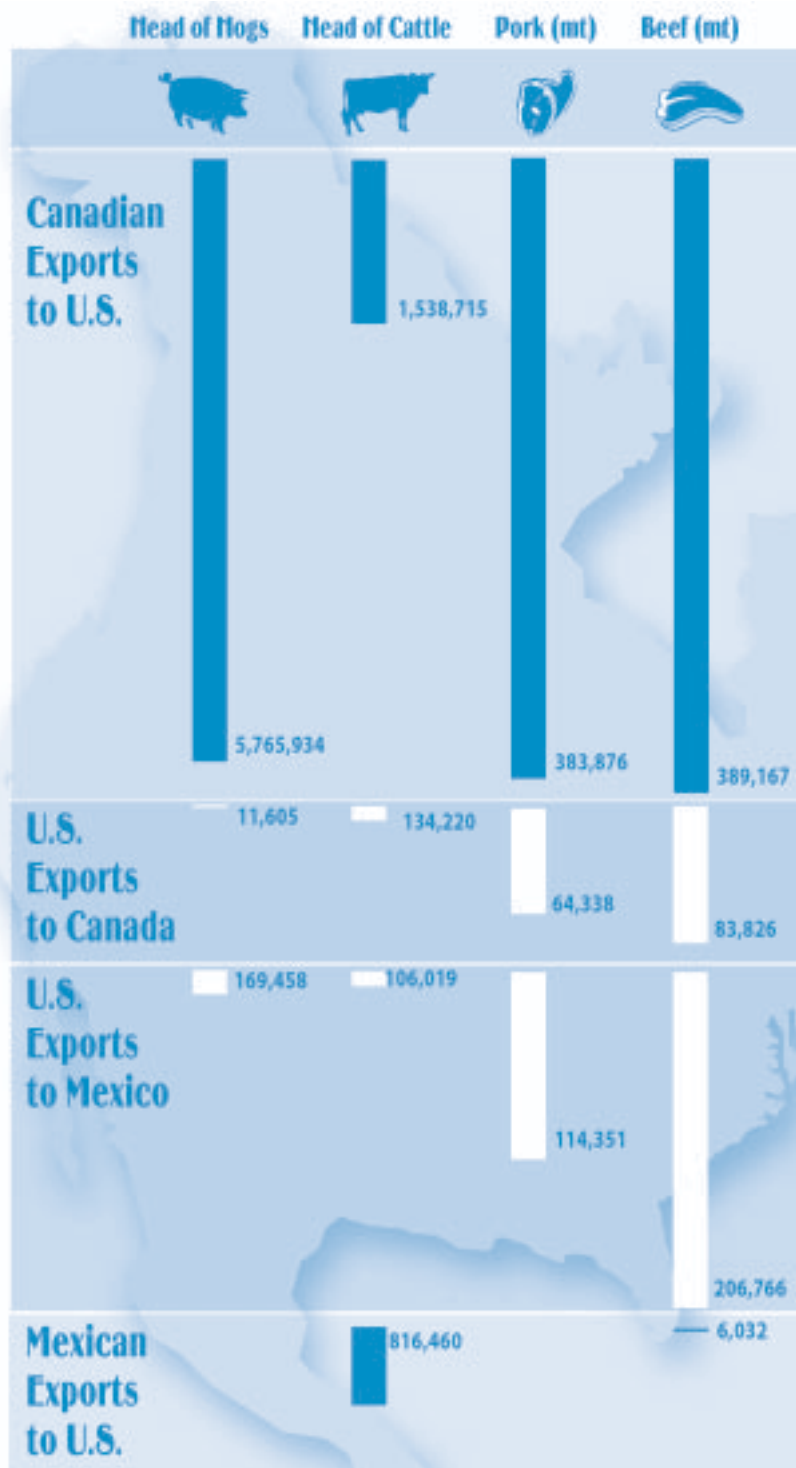
The accompanying chart illustrates the extent of integration in the North American meat and livestock industries that has occurred since the implementation of NAFTA. As shown, this integration is especially high between the United States and Canada.

The United States is Canada's most important market for livestock and meat exports. In 2002, Canada exported 1.54 million head of cattle and 5.76 million head of pigs to the United States. Given that 31 percent of these imports were feeder cattle and 68 percent were feeder pigs, these animals consumed an additional 73.9 million bushels of U.S. corn and 278,000 metric tons (mt) of U.S. soybean meal than would otherwise have been consumed by the U.S. livestock industry. Assuming that all these animals were eventually slaughtered in the United States, this trade increased U.S. cattle and pig slaughter by 4.3 percent and 5.7 percent, respectively, in 2002.

The importance of Canadian livestock and meat to the U.S. industry is especially apparent when viewed in the context of U.S. exports. In addition to livestock, Canada exported 389,167 mt of beef and 383,876 mt of pork (product weight equivalent) to the United States in 2002. At the same time, the United States exported 828,668 mt of beef and 549,989 mt of pork. Cumulatively, imports of Canadian slaughter animals and meat were equivalent to 55 percent of U.S. beef exports and more than 100 percent of U.S. pork exports. Adding in feeder animals makes Canada's contributions to U.S. export totals even higher.

Canadian livestock production and slaughter are expanding in the western provinces, but the U.S. industry has greater overall slaughter capacity and the U.S. Midwest is more efficient at feeding pigs because of lower feed-grain costs. As a result, Canadian live animal exports to the United States represent 11 percent and 40 percent, respectively, of the Canadian live cattle and pig herds (based on January 1, 2002, inventories). This trade flow has allowed Canadian producers to expand production and to supply both cattle and pigs to fill out U.S. feeding and slaughter capacity.

Given Canada's lower slaughter, feeding, and meat consumption capacities, trade in the opposite direction is much less. The United States exported 127,135 head of slaughter cattle and 9,252 head of feeder and slaughter pigs





to Canada, which were equivalent to 3.9 percent of Canada's cattle slaughter and 0.05 percent of Canada's pig slaughter in 2002. These exports accounted for 0.14 percent and 0.02 percent of the U.S. cattle and pig herds, respectively. Canada is an important but comparatively smaller market for U.S. red meats, with imports totaling 83,826 mt of beef and 64,338 mt of pork in 2002. The United States fills spot export needs and some consumption needs in Canada.

Under normal circumstances, any large reduction in U.S. imports of Canadian animals and/or meat would eventually increase Canadian meat exports to other parts of the world and reduce total U.S. meat exports unless U.S. production expanded.

With the discovery of bovine spongiform encephalopathy (BSE) in the Canadian beef herd, however, Canada will suffer from a large surplus of beef and variety meats that normally would have been exported.

Integration of Mexico, the third member of NAFTA, into the North American red meat complex has been slowed by lack of infrastructure and by sanitary, political, and social issues. Despite these hurdles, Mexico is a growing importer and exporter of animals and meats. In 2002, Mexico imported 271,671 mt of beef and 157,402 mt of pork from the United States and Canada combined. At the same time, Mexico exported more than 800,000 head of cattle to the United States and about 45,000 mt of

pork, mostly to Japan. Recent livestock trade between the United States and Mexico has fluctuated widely because of weather conditions, trade barriers, and sanitary barriers, but unrestricted trade would continue to pull lightweight U.S. pigs and Mexican feeder steers across the border. In addition to Mexico's large potential to import more muscle meats, Mexico provides by far the largest market for U.S. beef and pork variety meat exports, making it a valuable complement to markets that purchase large quantities of high-value muscle meats. However, sanitary and border issues will need to be resolved before Mexico's full integration and full potential as an export market can be realized. ♦

#### *Iowa's Agricultural Situation* *continued from page 6*

cent of Iowa's soybean acreage to herbicide resistant varieties, 2 percent higher than March intentions, and 3 percent above the national share. Despite some stormy weather, overall excellent weather conditions in early July spurred crop growth. At the beginning of July, topsoil moisture was rated 3 percent very short, 13 percent short, 73 percent adequate, and 11 percent surplus. Subsoil moisture had similar ratings across the state. At that time, 82 percent of Iowa corn and 80 percent of soybeans were in good to excellent condition.

On the demand side, lower carry-over stocks and increased ethanol usage offset most of the projected corn production gain of 30 to 36 percent over last year. According to the June USDA *Grain Stocks* report, national corn stocks in all positions totaled 2.98 billion bushels, down 17 percent from last year's levels. The spring corn utilization was 2.15 billion bushels, 5 million bushels below the 2002 level. Despite reduced stocks, smaller crops in Russia and Ukraine, and strong corn demand for both exports and domestic use,

analysts agree that a dry weather outlook is needed to push corn prices considerably above loan rate levels at harvest. On the news of excellent growing conditions, September corn futures dropped to \$2.15 per bushel on July 10, a decline of 10.25¢ over the week.

Dampening of soybean prices followed an unexpected increase in quarterly soybean stocks, increased acreage, and favorable weather conditions. However, continuing strong export demand enhanced by a weaker dollar balanced the downturn. According to official estimates, soybean storage totaled 602 million bushels, down 12 percent from the 2002 level but above prior trade expectations. Analysts predict that soybeans may rally after the ample South American crop has gone through marketing channels and if the weather deteriorates. In light of the reports, August soybean futures fell 12¢ to close at \$6.0275 per bushel on July 10.

#### **LIVESTOCK INVENTORY**

According to the June USDA *Hogs and Pigs* report, the national hog inventory continues to diminish, to a level 2.6 percent below that of last year. The breeding herd declined the

fourth time in a row, down 4.3 percent from this time last year. The market herd was 2.4 percent below the 2002 level and, looking at the reduced spring pig crop, is not likely to meet or exceed last year's level until winter. However, looking at fall farrowing intentions coupled with the higher productivity indicated in the report, analysts warn that spring marketing numbers in 2004 may surpass those for 2003.

In Iowa, there were 15.5 million hogs and pigs, down 1 percent from last year's level. The breeding herd inventory was recorded at over 1 million head, down 8 percent from the level in 2002 but identical to the March 2003 level. The number of market hogs on Iowa farms was unchanged compared to a 2.4 percent decline nationwide. Iowa remains first in the nation in hog production, with North Carolina running a close second. Iowa's share of the nation's breeding herd inventory has declined from 24 percent in 1983 to approximately 17 percent in 2003. So far this summer, hog prices have been 13 percent above last year's lows and are expected to remain at levels profitable for most producers (at or above \$40/cwt) until the year's end. ♦

## U.S. Agriculture and the Value of the Dollar

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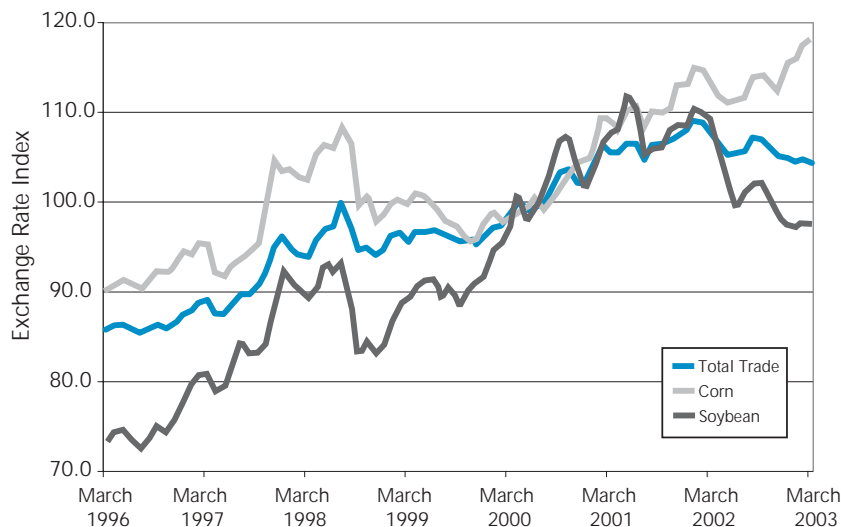
**R**oughly 20 percent of U.S. agricultural production is exported to other countries. So our competitiveness in export markets is crucial to the stability and growth of U.S. agriculture. One of the fundamental factors in our competitiveness in export markets is the currency exchange rate. The currency exchange rate is the ratio of the value of a nation's currency to the value of another nation's currency. Many factors affect exchange rates, including the countries' macroeconomic policies, fiscal situation, and expected economic growth. Changes in the exchange rate affect our agricultural trade competitiveness because they indicate relative changes in the prices for traded goods in other countries. Nearly half of the change in the real value of U.S. agricultural exports can be attributed to changes in exchange rates.

### DECLINING EXPORTS WITH DOLLAR APPRECIATION

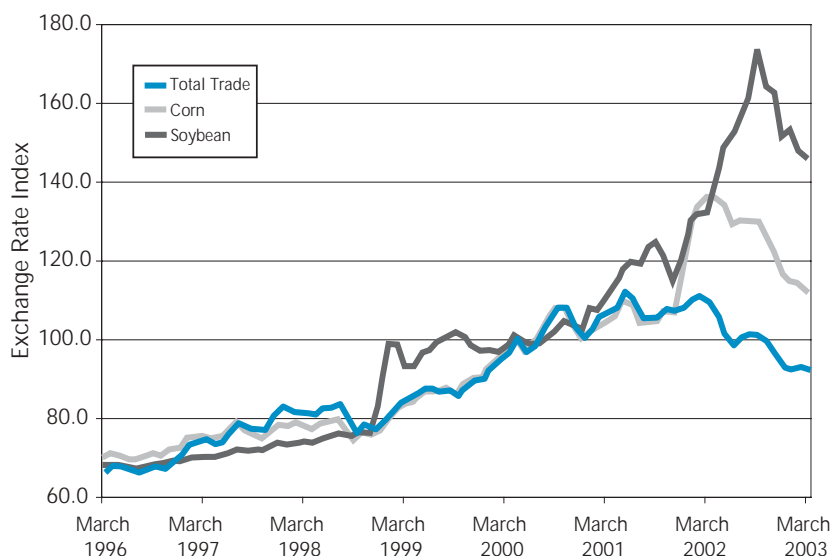
Figure 1 shows indices for exchange rates with countries that purchase U.S. exports. The line called "Total Trade" represents the exchange rate index, in which individual exchange rates are weighted by the value of U.S. export trade to that country or region. Figure 2 shows similar indices for exchange rates with our export competitors. From 1996 to 2001, the U.S. dollar appreciated in value in comparison to most other currencies. Prices for our exported goods rise and fall with the dollar. So the years of late 1990 and early 2000 were, in general, rough for U.S. exports. Agricultural exports were no exception. U.S. wheat exports fell 22.6 percent between 1995/96 and 2001/02. U.S. corn exports declined by 15.2 percent over the same period.

As the figures show, the dollar was strong not only against the cur-

**FIGURE 1. EXCHANGE RATE INDICES FOR U.S. EXPORT MARKETS (AVERAGE FOR 2000 = 100)**



**FIGURE 2. EXCHANGE RATE INDICES FOR U.S. EXPORT COMPETITORS (AVERAGE FOR 2000 = 100)**



rencies of our export markets but also against the currencies of our export competitors. This was a one-two punch to U.S. exports, in that our export products were relatively more expensive to other countries (in comparison to past values) and the products of our export competitors were relatively inexpensive (in comparison to U.S. products).

### WEAKENING DOLLAR POINTS TO SOME STRENGTHENING EXPORTS

Recently, changes in the exchange rate have favored U.S. exports. The total trade-weighted index has declined from the highs of early 2002 from both the export market and export competitor standpoints. An example of this is the change in U.S. pork exports. Over the first five

months of 2003, U.S. pork exports increased by 5 percent from last year's level. Much of this increase can be traced to Japan and South Korea, as these countries accept about half of all U.S. pork exports. Further, part of this increase can be explained by changes in exchange rates. During this five-month period, the dollar held steady versus the Japanese yen but depreciated versus the currencies of our other major pork exporters to East Asia, namely, Canada, Brazil, and Denmark.

However, not all commodities are necessarily benefiting from a weaker dollar. Figures 1 and 2 also display exchange rate indices weighted by corn and soybean export values. Figure 1 shows that

the dollar is still appreciating in many corn export markets while it is generally declining overall and in most soybean export markets. In fact, the depreciation in the soybean markets has exceeded the total trade-weighted average.

The indices in Figure 1 indicate the relative price of U.S. exports over time. The indices in Figure 2 indicate the price of U.S. exports relative to competing exports. Again, we can see the weakening of the dollar from a total trade perspective. But for both corn and soybeans, the dollar was relatively stronger versus the competing currency. This is especially true for soybeans, as the dollar significantly appreciated versus the

Brazilian real and the Argentine peso (the currencies of other major soybean exporters) throughout most of 2002. For 2003, the indices have dropped for both corn and soybeans, highlighting an improving export picture. If many of these exchange rate trends continue, U.S. agriculture will see a reversal of the export erosion from earlier periods and the possibility of record export growth in the future.

#### FOR MORE INFORMATION

More information about the way a trade-weighted exchange rate index is derived is available online at <<http://www.ers.usda.gov/data/exchangerates/derived.htm>>. ♦

## And the Survey Said...

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To everyone who took a moment to complete our readership survey in the last issue of the *Iowa Ag Review*, I extend my appreciation. Surveys are hardly a popular activity for most of us, but in the case of our newsletter, the results will help us to make more informed choices—and a better publication.

One of the issues we wanted to address in the survey is print versus electronic distribution. During tight budget periods, the costs of printing come under increased scrutiny. Fortunately, at CARD, the issue right now is one of reader choice, not of budget necessity. And the choice of a majority of those surveyed (77.57 percent) is to retain their printed copy of the *Iowa Ag Review*. We plan to continue offering free subscriptions to interested readers. We also will continue to offer the *Iowa Ag Review* online, as we have for some time (<[http://www.card.iastate.edu/iowa\\_ag\\_review/home.html](http://www.card.iastate.edu/iowa_ag_review/home.html)>), so the choice is yours. At some point, we hope to improve the online version of *Iowa Ag Review* so that electronic subscribers receive a notice when a new

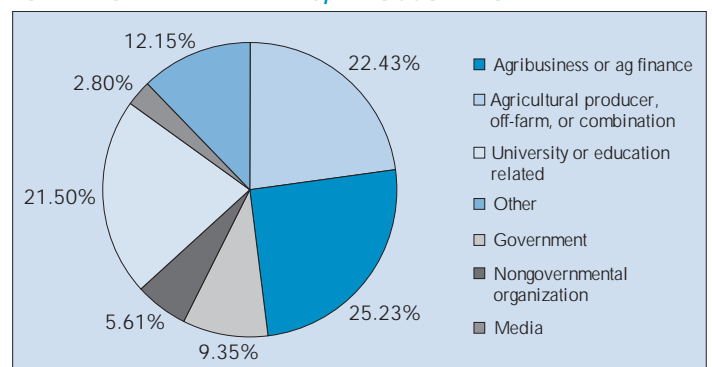
issue is available on our website. When that enhancement is ready, we will include a business reply in our mailing for readers to tell us whether they would like to opt out of the print subscription in favor of an electronic one.

We found that of those surveyed, 40.19 percent have read the *Iowa Ag Review* for more than five years. Almost a quarter of the group started reading because they received a pass-along copy from a friend or colleague. And the majority reads one-half to all of the content cover to cover. However, we found that interest in the staff profile was moderate, whereas other features received high interest ratings. Beginning with this issue, we've decided to drop the staff feature in favor of other content that is of higher relevance to our readers. Many in the survey group took the time to suggest ideas for features. From the abundance of CARD research and ideas for content, we will choose features that are timely and of pressing importance to our readers, especially in the areas of commodity policy, international

trade, and technology issues in agriculture, all hot topics according to the survey results.

The *Iowa Ag Review* was created in 1994 to serve as a conduit so that the results of the policy analysis and research coming out of the Center for Agricultural and Rural Development and its affiliates would reach "farmers, agribusinesses, legislators, and other persons interested in Iowa agriculture." The publication may change a little from year to year, but the mission remains the same. The opportunity to provide feedback about the newsletter does not end with this survey. Please send any general comments about the *Iowa Ag Review* to *sclarke@iastate.edu* or write to the *Iowa Ag Review* at the address in our masthead. ♦

IOWA AG REVIEW READERS, BY OCCUPATION



Source: Spring 2003 Readership Survey.

# Recent CARD Publications

## BRIEFING PAPERS

Beghin, John C., and Ataman Aksoy. Agricultural Trade and the Doha Round: Lessons from Commodity Studies. July 2003. 03-BP 42.

Hayes, Dermot J., and Helen H. Jensen. Lessons from the Danish Ban on Feed-Grade Antibiotics. June 2003. 03-BP 41.

## STAFF REPORTS

Babcock, Bruce A., Jacinto F. Fabiosa, Holger Matthey, Murat Isik, Simla Tokgoz, Amani El-Obeid, Chad E. Hart, Frank H. Fuller, Seth Meyer. An Analysis of the Proposed Doha Round Modalities. June 2003. 03-SR 98. (Available online only).

## TECHNICAL REPORTS

Gassman, Philip, Todd Campbell, R. Cesar Izaurralde, Allison M. Thomson, and Jay D. Atwood. Regional Estimation of Soil Carbon and Other Environmental Indicators Using EPIC and i\_EPIC. April 2003. 03-TR 46.

## WORKING PAPERS

Beghin, John C., and Holger Matthey. Modeling World Peanut Product Markets: A Tool for Agricultural Trade Policy Analysis. May 2003. 03-WP 332.

Hart, Chad E., Dermot J. Hayes, and Bruce A. Babcock. Insuring Eggs in Baskets. July 2003. 03-WP 339.

Hennessy David A., and Donald Lien. Ledger Provision in Hog Marketing Contracts. June 2003. 03-WP 336.

Jha, Manoj, Zaitao Pan, Eugene S. Takle, and Roy Gu. The Impacts of Climate Change on Stream Flow in the Upper Mississippi River Basin: A Regional Climate Model Perspective. July 2003. 03-WP 337.

Kling, Catherine L., John A. List, and Jinhua Zhao. The WTP/WTA Disparity: Have We Been Observing Dynamic Values but Interpreting Them as Static? May 2003. 03-WP 333.

Kostova Huffman, Sonya, and Helen H. Jensen. Do Food Assistance Programs Improve Household Food Security? Recent Evidence from the United States. June 2003. 03-WP 335.

Kostova Huffman, and Maureen Kilkenny. Regional Welfare Programs and Labor Force Participation. May 2003. 02-WP 296. (Revised).

Kurkalova, Lyubov A., Catherine L. Kling, and Jinhua Zhao. Institutions and the Value of Nonpoint Source Measurement

Technology: Carbon Sequestration in Agricultural Soils. July 2003. 03-WP 338.

Moschini, GianCarlo. Intellectual Property Rights and the World Trade Organization: Retrospect and Prospects. May 2003. 03-WP 334.

Saak, Alexander E. Location, Planting Decisions, and the Marketing of Quality-Differentiated Agricultural Commodities. May 2003. 03-WP 331.

Saak, Alexander E. Spatial Production Concentration, Demand Uncertainty, and Multiple Markets. July 2003. 03-WP 340.

Wu, JunJie, Richard M. Adams, Catherine L. Kling, and Katsuya Tanaka. Assessing the Costs and Environmental Consequences of Agricultural Land Use Changes: A Site-Specific, Policy-Scale Modeling Approach. May 2003. 03-WP 330.

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