



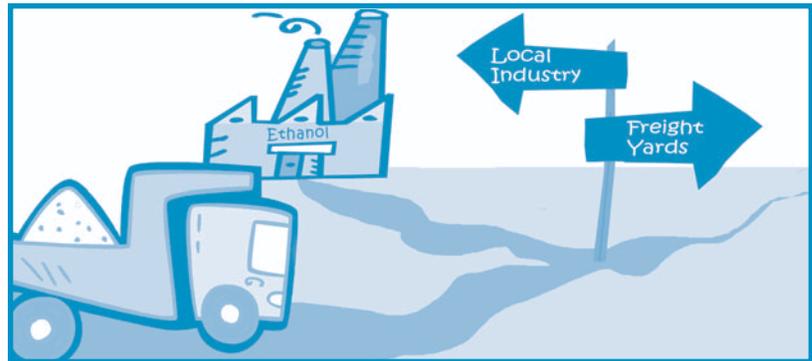
Processing or Exports: Which Path for U.S. Grain?

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Iowa is the center of the world's most productive corn and soybean region. Along with Illinois and Indiana to the east, Minnesota and South Dakota to the north, Nebraska to the west, and Missouri to the south, this region produces an abundance of low-cost feed that when used by the highly efficient U.S. meat and dairy sectors provides consumers with low-cost food. The traditional view of agriculture in this region is one in which domestically produced grain is fed to domestically produced livestock that is slaughtered for domestic consumption. The surplus grain is then exported to support domestic livestock sectors in other countries.

The current reality of midwestern agriculture is far different from this traditional organization. Under NAFTA, the livestock sectors of Canada, Mexico, and the United States have become much more integrated, with increased trade in feed, meat, and live animals. Meat exports outside of North America have also increased dramatically, as countries comply with international trade agreements and open their borders to lower-cost imports.

Minnesota provides a hint that we may continue this trend away from reliance on exports markets for our surplus grains. The Minnesota Corn Growers Association has a long-term goal of not exporting any unprocessed corn, soybeans, or wheat outside the state's borders. Expanded soybean crushing facilities, new ethanol plants, and increased support for livestock operations are all part of Minnesota's plan to achieve this objective. Other states are also pushing



for increased utilization of grain as a means of adding income, jobs, and opportunities in rural America.

But increased domestic utilization is not a certainty. Opposition to modern livestock operations in many parts of the Corn Belt could drive the domestic livestock industry out of the region or even out of the country. Incentives for biofuels or other value-added processes may disappear. As is often the case, the future direction of Corn Belt agriculture will depend in part on markets and technology and in part on government policy. A domestic emphasis on grains processing and utilization has many policy implications; a review of recent trends helps set the stage for evaluating some of these choices.

IS DOMESTIC CORN AND SOYBEAN USE INCREASING?

The best way to measure how the importance of domestic use has changed over time is to express annual use as a proportion of total supply available in a given year. Figure 1 (page 3) shows that the share of U.S. corn used domestically has increased by an average of about two-thirds of a percentage point each year since 1986. Over this period the supply of corn has increased by about 17 percent. This means that domestic use of corn

over this period has grown significantly faster (at about 2.2 percent per year) than has the supply of corn.

The share of U.S. soybeans used domestically has remained relatively stable at about 59 percent. This stability in share does not mean that there has been no change, however. Both production and utilization have increased by about 2.4 percent per year. The large increase in U.S. soybean production over this period was brought about by changes in federal commodity policy. Most observers feel that further increases in the supply of U.S. soybeans is unlikely given the slowdown in growth of soybean yields relative to corn yields and given that available land suitable for more soybean production is limited. Thus, if domestic use of soybeans continues to expand, then it is likely that the picture for soybeans in the future will resemble the corn trend shown in Figure 1.

Figure 2 (page 3) shows that all domestic uses of corn have increased in relative importance since 1990, with ethanol use increasing by the largest amount. One explanation for this trend is that the amount of meat produced in the United States from domestically produced feed has increased dramatically over this period, with pork exports increasing by 1.5 billion pounds and beef exports (pre-BSE) increasing by 1.2 billion pounds. For

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soybeans, non-feed use is rising but is still of quite minor importance.

RURAL BENEFITS FROM INCREASED DOMESTIC UTILIZATION OF GRAIN

A benefit of increasing domestic utilization of corn and soybeans is enhanced economic activity in rural areas of the United States. Crop production techniques continue to use more machinery, chemicals, and biotechnology and less labor. The problem for rural areas is that the production of machinery, chemicals, and new biotech products occurs largely in urban areas, whereas the displacement of labor occurs in rural areas. Processing of crops through livestock production, biofuel plants, soybean processing plants, and other value-added endeavors puts jobs and income into rural areas. Put simply, a billion bushels of corn that is sold overseas means far fewer rural jobs than a billion bushels of corn that is processed domestically.

The second benefit from increased domestic utilization is higher prices. Of course, any increase in demand for crops will result in higher prices. But an increased share of production that is used domestically will also increase local prices by a strengthening of basis.

Basis is the difference between the local price and the price in some other location, usually a central buying point or a commodity exchange. In grain surplus regions, local prices will be below prices at these buying points because of transportation costs. In general, the farther that grain has to travel from a surplus region, the lower will be the local price. The price must be lower for grain from surplus regions to enable it to compete on a delivered price with grain from other regions. In grain deficit areas, local prices will be higher than prices at central buying points. Otherwise, grain would not flow into the area to cover the deficit.

It is possible for an area to switch from grain surplus to grain deficit. For example, southern Minnesota generally grows surpluses of both corn and soybeans. Thus, local

prices in these areas are generally much below prices on the Chicago Board of Trade. But the short 2003 soybean crop has turned this region into a soybean deficit area. In late June and early July of this year, Minnesota Soybean Processors in Brewster, Minnesota, paid nearly \$1.50 more per bushel than prices quoted on the Chicago Board of Trade. In contrast, bids for soybeans delivered in October were about \$0.30 less per bushel than Chicago prices, which indicates an expectation that the 2004 crop will return soybean surpluses to this region.

The direct link between local prices in surplus areas and transportation costs explains why modernizing the lock and dam system on the Upper Mississippi River is of such importance to U.S. corn and soybean producers in the Corn Belt. Such an investment would lower the cost of transporting surplus grain to overseas markets, thereby increasing local prices.

POLICY CHOICES

Increased domestic utilization of grain offers the twin benefits of increased rural vitality and higher local grain prices. So if Congress wants to increase rural economic development it would seem logical that it pass policies that encourage domestic uses of corn and soybeans while de-emphasizing policies that encourage grain exports.

Congress could choose many policy incentives that would encourage increased domestic utilization and rural vitality but that would not enhance national wealth. For example, Congress could give pork producers a marketing loan at \$75 per cwt. This would perhaps triple feed use and jobs in the pork industry, but the cost of such a program would make it a foolish policy choice. Are there sensible policy choices that can accomplish the same goal?

Two roles of government that are consistent with an objective of maximizing national wealth—and that can help determine the direction of Corn Belt agriculture—are investments in

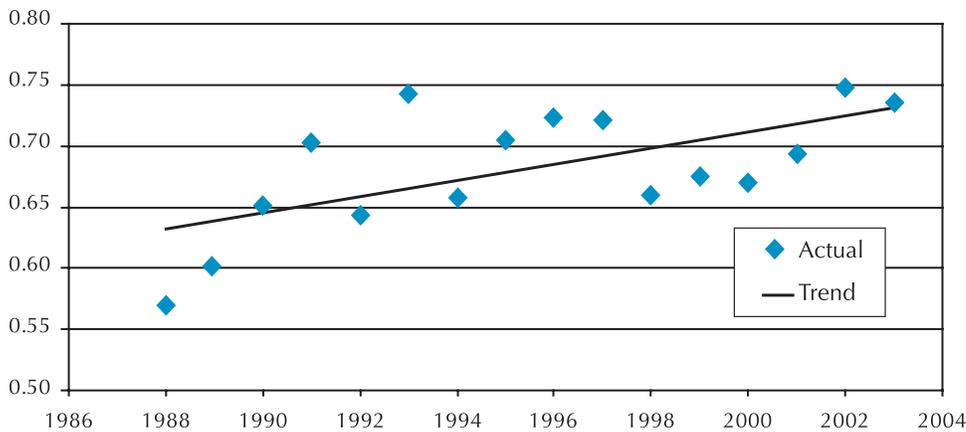


FIGURE 1. SHARE OF U.S. CORN SUPPLY USED DOMESTICALLY

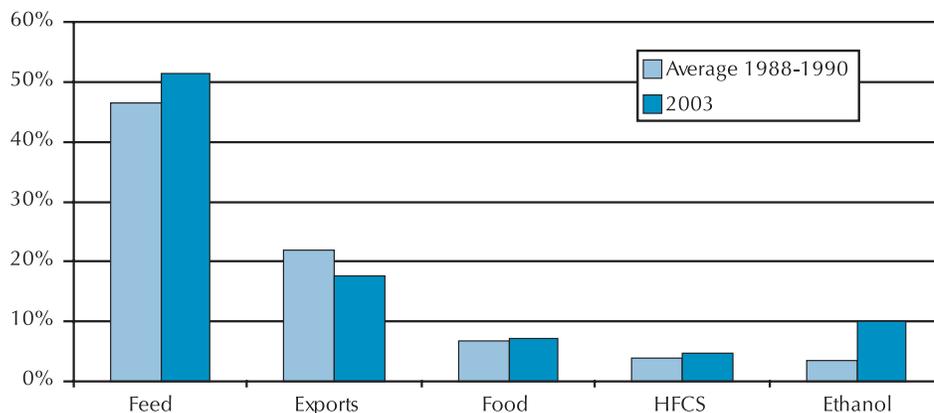


FIGURE 2. SHARE OF TOTAL CORN SUPPLY BY CATEGORY

transportation infrastructure and investments in research. Both of these are examples of what economists call “public goods”—goods of benefit to all that are underprovided by the private sector because full benefit from consuming them cannot be captured by producers.

Investment in research can enhance domestic utilization of corn and soybeans in many ways. The number-one customer of corn and soybeans is the domestic livestock industry. Research into more efficient production and manure-handling techniques that can lower the off-site impacts of large facilities, thereby decreasing rural opposition to new facilities, would expand the domestic demand for feed.

The largest potential growth in domestic utilization of corn and soybeans is the substitution of renew-

able plant-based products for petroleum-based products. Fuels, solvents, lubricants, plastics and building materials can all be made from plants. But often the costs of producing the substitute products are much greater than the prevailing prices of the petroleum-based products. Research that can lead to the development of new, more efficient processes for converting plants into new products can clearly help achieve the goal of increased domestic utilization.

The key decision about transportation investments is where to place the focus: on lowering the cost of moving grain out of surplus regions or on moving value-added products that are produced in surplus regions. Given that the railroads are privately owned and operated, the government has relatively little influence over rail

investments. However, the public owns the road system and determines how the Missouri and Mississippi rivers are operated.

As a general rule, if the objective is to encourage processing in grain surplus regions, then encouraging grain exports by lowering the cost of moving grain to export ports does not make sense. From this perspective, improvements in the lock and dam system on the Mississippi River for the purpose of lowering the cost of moving grain would be counterproductive, as would continued management of the Missouri River as a grain-moving artery.

Transportation investments that reduce the cost of moving such value-added products as meat and new plant-based fuels are consistent with an objective of encouraging domestic utilization. Thus, maintenance of the interstate highway system in rural areas and investments in more efficient links between railroads, highways, and port facilities should be supported for this policy prescription. A prime example of such an investment is the \$2.4 billion Alameda Corridor that links the nation’s rail system with the ports of Long Beach and Los Angeles. This investment has lowered the cost of shipping chilled pork from midwestern packinghouses to Japan.

A continued decline in the importance of export markets for corn and soybeans will have large economic and political impacts. The economic impacts will be largely positive for grain surplus regions in the Midwest and Great Plains as more processing and livestock facilities are constructed. The political impacts are more uncertain. Corn Belt grain farmers have been among the strongest advocates for international trade agreements because their fortunes have traditionally been tied to foreign demand for their products. As direct export demand for grain becomes less important, will this support fade? If it does, then U.S. trade negotiators will find it more difficult to make trade deals that are in our nation’s interest. ♦

Valuing Water Quality in Midwestern Lake Ecosystems

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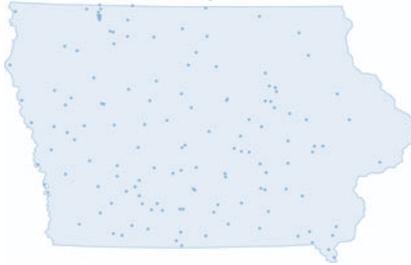
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Lakes Study Sites



Editor's note: This content is reprinted from an award-winning poster presented at the U.S. Environmental Agency's 2004 Science Forum.

OVERVIEW

As increased attention is focused on the issue of water quality in the state of Iowa, policymakers must grapple with the pressures of balancing federal water quality requirements, tight conservation budgets, and citizen concern for environmental preservation and restoration of Iowa's water resources. Efforts to improve water quality typically entail significant costs, either in the form of state resources to fund cleanup efforts or private costs associated with altering land uses, farming practices, municipal treatment facility expansions, or other investments.

To make good policy decisions regarding water quality, it is important to understand not only the physical processes that affect water quality but also the degree to which citizens value improvements in water quality and are willing to make trade-offs to enjoy improved quality in Iowa's lakes. Since water quality improvements may be costly, it is necessary to know how much benefit people obtain from these improvements if society is to answer the question of whether it is "worth it" to undertake these projects. In many cases the question will be one of degree: that is how much improvement in water quality should we strive for? What amount of improvement in water quality is simply too expensive and would thereby require forgoing other public investments that are more valuable to the citizenry?

To provide this information, researchers from Iowa State University have initiated an ambitious, multi-year study effort termed "The Iowa Lakes Valuation Project."

The Iowa Lakes Valuation Project is an economic study of the use and value Iowans place on water quality in Iowa lakes. Data for this study will be collected for a four-year period through the use of annual mail surveys to a random sample of Iowa residents. The data gathered will include

- actual trips to Iowa's 130 principal recreational lakes for the years 2001-2006;

- water quality evaluations used to measure willingness to pay for quality improvements;
- knowledge and perceptions regarding lake quality; and
- socio-demographic data.

The value of water quality improvements in Iowa lakes is measured using the economic value concept of maximum willingness to pay. The maximum amount that an individual is willing to pay for an environmental good measures the value they place on that good in that it represents the value of other goods and services they are willing to forgo to acquire or preserve the environmental resource.

The Iowa Lakes Valuation Project is a collaborative study involving economists and ecologists from the Iowa State University Department of Economics, Center for Agricultural and Rural Development, and Department of Evolutionary Ecology and Organismal Biology. Dr. John Downing and other members of the ISU Limnology Laboratory have a complementary five-year project to provide the Iowa Department of Natural Resources with a lake database that will include water chemistry, biological analysis, and watershed GIS data for 130 of Iowa's principal recreational lakes.

EPA'S STAR GRANT AUGMENTS WORK BEGUN WITH IOWA DNR FUNDING AND ISU-CARD

The funding for the first year of the survey was provided by the Iowa Department of Natural Resources. A STAR grant from the U.S. Environmental Protection Agency provided the necessary funding to continue the survey for the full four years, thereby allowing the collection of this unique multi-year data set and interdisciplinary study.

FIRST YEAR STUDY

Iowans report a high usage of lakes in the state of Iowa. Approximately 62 percent of Iowa households visited one of the 130 lakes listed in the survey and the average number of trips per year was just over eight in 2002.

Water quality is more important than either proximity or local park facilities in determining where households recreate. Figure 1 shows the results of a question that asked respondents to allocate 100 importance points to a

First of four mail surveys

8,000 Iowa residents selected at random

Survey collected

- trip data for 132 lakes
 - 2001 and 2002 actual trips
 - 2003 anticipated trips
- attitudes regarding lake quality
- socio-demographic data

62.1% response rate
(90% coverage including telephone follow-ups)

number of factors they might consider when choosing a lake for recreation. The average point allocation is shown. Respondents indicated that water quality was the most important factor they consider when choosing a lake for recreation, with proximity of the lake and park facilities also being relatively important. In contrast, activities near the lake or town are not particularly important in their choice of a lake site.

Among water quality attributes, households view safety from bacterial contamination and water clarity as the most important, above the diversity or quantity of fish caught or the diversity of wildlife. Figure 2 shows the

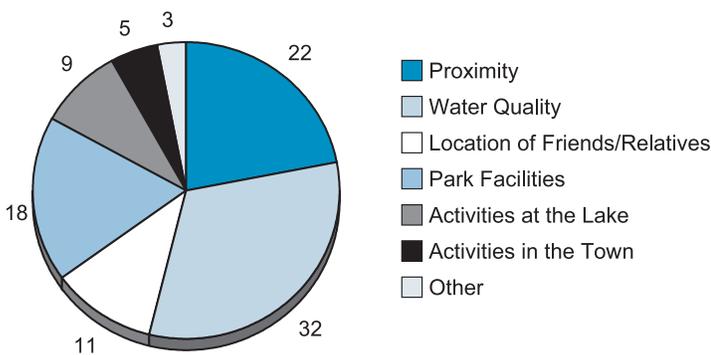


FIGURE 1. AVERAGE ALLOCATION OF IMPORTANCE POINTS TO FACTORS IMPORTANT IN CHOOSING A LAKE FOR RECREATION

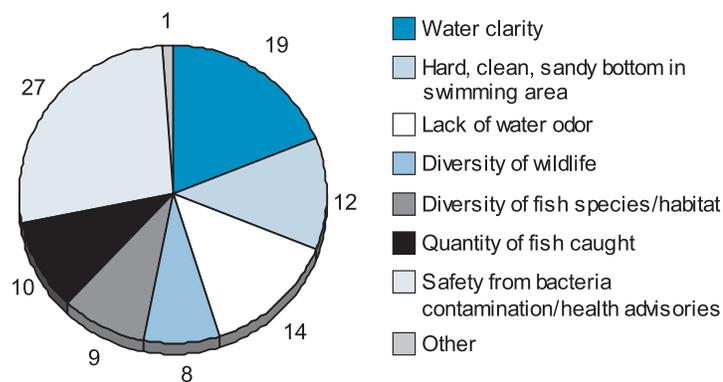


FIGURE 2. AVERAGE ALLOCATION OF IMPORTANCE POINTS TO LAKE CHARACTERISTICS

results of a question that asked respondents to allocate 100 importance points to a number of lake characteristics that might be important to them. Again, the average point allocation is shown. Respondents indicated that safety from bacteria contamination was the most important lake characteristic, with water clarity also receiving a fairly large point allocation. The lack of odor and the presence of a hard, clean, sandy bottom in swimming areas are also important to some respondents.

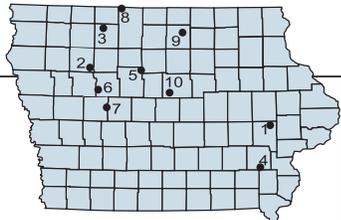
For more information about this project, visit <http://www.card.iastate.edu/lakes>. ♦

Improving a few lakes to very high water quality levels is more valuable than water quality improvements that would remove all lakes from the impaired list		
	Nine focus lakes ¹ Improved to the physical water quality of the cleanest lake in the State	Sixty-five impaired lakes ² Improved to the median physical water quality of the non-impaired Lakes
Average Valuation		
per Iowa household	\$16.74	\$12.24
for all Iowa households	\$19,300,000	\$14,100,000

¹The nine lakes were chosen based on recommendations by the Iowa Department of Natural Resources for possible candidates of a clean-up project.

²Listed on the EPA's impaired waters list; this scenario brings all the impaired lakes up to the median physical measures of the non-impaired lakes.

The value of lake water quality improvements varies notably based on current conditions of the lake and proximity to population centers



HIGHEST VALUED IMPROVEMENTS TO IMPAIRED LAKES ¹					
Lake	ANNUAL valuation of the water quality improvement	Current Conditions			Iowans' average one-way travel distance
		Secchi Depth (meters)	Total phosphorus (ug/l)	Total ANNUAL 2002 Trips	
1. Coralville Lake	\$11,800,000	0.8	204.2	510,000	130
2. Storm Lake	\$1,200,000	0.5	89.2	267,000	185
3. Trumbull Lake	\$1,100,000	0.1	452.6	20,000	195
4. Lake Darling	\$1,000,000	0.3	226.0	67,000	143
5. Badger Creek Lake	\$1,000,000	0.6	289.7	66,000	128
6. Black Hawk Lake	\$900,000	0.9	193.0	139,000	162
7. Swan Lake	\$600,000	0.2	327.3	145,000	152
8. Tuttle Lake	\$500,000	0.2	310.5	37,000	203
9. Clear Lake	\$400,000	0.8	61.9	454,000	151
10. Little Wall Lake	\$400,000	0.5	81.0	53,000	124
Average across all of the 65 Impaired Lakes	\$500,000	0.8	140	83,000	162

¹ Ranking of impaired lakes by the value of improving each individually to the median physical water quality values of the non-impaired lakes.

Agricultural Situation Spotlight

How the Brazil-U.S. Cotton Dispute Could Affect Iowa's Agriculture

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Recently, a World Trade Organization (WTO) panel ruled on a dispute between Brazil and the United States. The dispute, filed by Brazil over cotton subsidies, accused the United States of lowering world agricultural prices and distorting agricultural trade flows through various forms of agricultural support. Preliminary findings, as reported by major news sources such as CNN, the *New York Times*, and the *Economist* magazine, indicate that the WTO panel agreed with most of Brazil's case. The results of these findings and the ongoing WTO agricultural trade negotiations could have a dramatic impact on the ways agriculture can be supported by the federal (and state) government. And these possible changes in support could affect production agriculture in Iowa.

BRAZIL'S DISPUTE ON U.S. COTTON SUPPORT

While the WTO dispute has several components, the essence of Brazil's claim is that the United States violated WTO commitments by providing support through various trade-distorting programs in an amount that exceeded allowable levels. The types of support challenged include cotton-specific programs, such as the Step 2 program, and more general programs, such as the marketing loan and direct payments programs. The reports suggest that the WTO panel found fault with both the cotton-specific and the general programs.

The WTO panel's report is not widely available as of this writing but is expected to be released to the general public sometime this summer. Therefore, comments in this article

are based on published reports from news agencies covering the dispute. If the WTO panel ruled that the general programs had distorted world production and trade in cotton, then changes may be required in these programs to limit these distortions and bring U.S. agricultural policy back in line with our WTO agricultural commitments. The general programs (direct payments, countercyclical payments, marketing loans, and crop insurance) make up the vast majority of U.S. agricultural support that flows directly to producers. These programs are in effect for several crops, not just for cotton. Thus, if the cotton dispute ruling stands, changes in these programs for all program crops may be warranted.

WTO trade disputes are like court cases in that the parties may appeal decisions handed down by dispute panels. The United States will most certainly appeal this ruling and attempt to overturn the deci-

sion. However, if the decision stands, then policymakers will need to adjust U.S. support programs to comply with the WTO or face penalties for not doing so. Exactly what adjustments would have to be made depends on the exact nature of the findings of the WTO panel. A reasonable guess, however, would be removal of any production and trade incentives from these programs, and this would likely be accompanied by smaller payments.

The cotton dispute arose from the large flow of funds going to U.S. agriculture in the late 1990s and early 2000s. Direct payments, called AMTA (Agricultural Market Transition Assistance) or "Freedom to Farm" payments, were paid out on an annual basis. Congress provided Market Loss Assistance payments to offset low commodity prices. Marketing loan benefits, through loan deficiency payments, increased dramatically over the period. Crop insurance premium

TABLE 1. GOVERNMENT SUPPORT (BILLION \$)

		1999	2000	2001	2002
Corn	Direct Payments	2.5	2.4	1.9	1.8
	Countercyclical Payments	0.0	0.0	0.0	0.0
	Market Loss Assistance Payments	2.5	2.5	2.2	0.0
	Marketing Loan Benefits	2.4	2.6	1.2	0.0
	Crop Insurance Benefits	0.1	0.0	0.2	0.9
Soybeans	Direct Payments	0.0	0.0	0.0	0.0
	Countercyclical Payments	0.0	0.0	0.0	0.0
	Oilseed Payments	0.0	1.3	0.0	0.0
	Marketing Loan Benefits	2.3	2.6	3.4	0.0
	Crop Insurance Benefits	0.1	0.2	0.1	0.3
Upland Cotton	Direct Payments	0.6	0.6	0.5	0.5
	Countercyclical Payments	0.0	0.0	0.0	1.3
	Market Loss Assistance Payments	0.6	0.6	0.5	0.0
	Marketing Loan Benefits	1.5	0.5	2.5	0.8
	Step 2 Benefits	0.3	0.4	0.3	0.2
	Crop Insurance Benefits	0.3	0.4	0.5	0.3

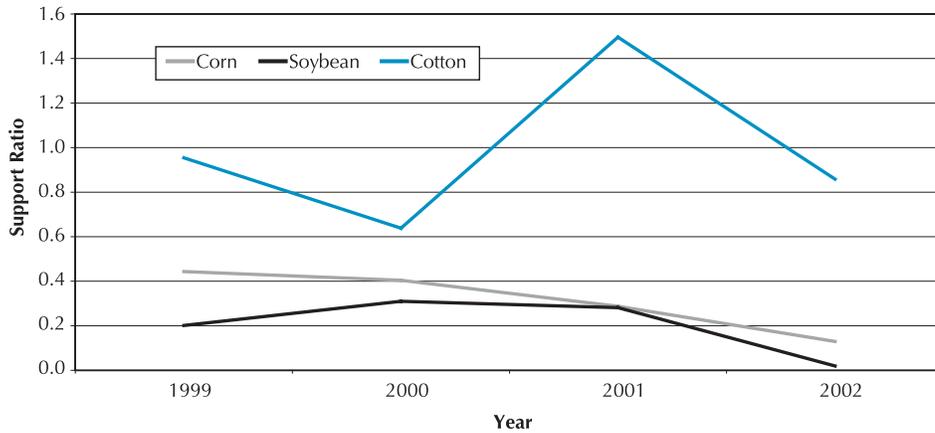


FIGURE 1. RATIO OF GOVERNMENT SUPPORT VERSUS VALUE OF PRODUCTION

subsidies were increased to induce participation. Between August 1999 and July 2003, roughly \$12.5 billion in support was provided to the U.S. cotton industry. That works out to just over \$3 billion in annual support. From 1999 to 2003, the annual total value of U.S. cotton production ranged from \$2.8 to \$5.3 billion. Table 1 shows the types and amounts of support going to cotton, corn, and soybeans for the 1999-2002 crop years. Figure 1 shows the ratios of the sum of this government support versus the value of production. As can be seen in Figure 1, the level of agricultural support was sizable in comparison to the value of production. This information, in combination with the market share of U.S. cotton exports in the world market, led Brazil to argue that these payments provided an additional incentive to produce (over and above the incentive from market prices alone) and that the resulting increase in production drove down world prices and blocked those cotton producers

who farmed without subsidization from trading opportunities.

CORN AND SOYBEAN PROGRAMS NEXT?

The WTO decision relates to Iowa agriculture because Iowa's major crops—corn and soybeans—have many of the same programs providing support. Also, the United States is a major exporter in these crops, as it is in cotton. So, parallel arguments could be made about the effects of government support on the production and trade of corn and soybeans. While the scale of government support for corn and soybeans is smaller (as measured by the ratio of support to production value), the overall amount of expenditures is larger for both corn and soybeans. In Iowa alone, direct payments for corn and soybeans amount to over \$500 million annually. Countercyclical payments could range from \$0 to over \$700 million annually. Most of Iowa's corn and soybean production is covered by crop insurance and/or is en-

rolled in the marketing loan program. Thus, any changes in these programs could have significant effects on the amount of agricultural support flowing to Iowa. Reports also suggest that export credit guarantee programs for several commodities, including cotton, corn, and soybeans, were investigated by the WTO dispute panel and found to be noncompliant. If the ruling holds, these guarantee programs would need to be eliminated.

Whether similar disputes against corn and/or soybeans would be successful would depend on the WTO dispute panel and the evidence brought forward by the parties in the dispute. But a study conducted by the Food and Agricultural Policy Research Institute in 2002 indicates that claims against U.S. corn and soybean programs would be more difficult to prove. The study looked at the production, price, and trade effects of the full liberalization of agriculture, that is, the removal of all agricultural trade barriers and support programs. If we examine the results for 2004 in comparison with the FAPRI baseline used in the analysis, world prices would be higher for all three crops under full agricultural liberalization. Cotton prices would be 18 percent above the level they would be if no liberalization occurred. Corn and soybean prices would rise by 5 and 4 percent, respectively. In two of the three commodities, U.S. production would fall. The analysis finds that corn production would increase with liberalization. The impact on cotton is again at least twice what it is on corn and soybeans.

Part of Brazil's case on cotton was that the subsidies drove U.S. production up and world prices down. The numbers in Table 2 attest to how such an argument could be made. World (not just U.S.) interference in these agricultural markets has significant effects. Cases against corn and soybeans would be tougher to argue, as the estimated impacts are one-third to one-half as large as they are for cotton. ♦

TABLE 2. WORLD PRICE AND U.S. PRODUCTION IMPACTS OF AGRICULTURAL LIBERALIZATION

Crop	World Price Change (percent)	U.S. Production Change (percent)
Cotton	+18	-11
Corn	+5	+4
Soybeans	+4	-3

Keeping Farmers on the Land: Agritourism in the European Union

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A relatively small amount of arable land, high population density, and high land and labor costs in several E.U. countries make it difficult for many families to stay on farmland that has been handed down for generations. Direct government help is limited because the European Union is under pressure to reduce agricultural subsidies. As part of the policy package developed to address these issues, the European Union has created incentives for producers to add value to agricultural production by participating in agritourism.

E.U. POLICY INCENTIVES BOOST EFFORTS

The E.U. policies that support agritourism are linked to efforts to market high-value foods based on a region's historical, cultural, and social traditions. These efforts include (1) geographical indications, which are protected within the European Union against production in any other region or country, (2) regional products, which are protected by a national government against production in any other part of that country, and (3) local products, which are linked to a local area's culture and history. The overall effect has been a gradual change in the way some E.U. farmers are using the land to produce and market agricultural products. E.U. member-states have followed suit by enacting complementary national policies to encourage agritourism as a method of revitalizing rural areas by increasing farm income, creating new jobs in rural communities, adding value to agricultural products, and diversifying the country's tourism sector.

Despite the many differences between E.U. and U.S. agriculture,



the E.U. approach to agritourism provides an interesting example of a policy package that encourages farmers to explore more than one alternative use for their land and output. Many of these policies favor younger producers, poorer regions, and less-favored areas where environmental restrictions limit production opportunities.

ITALIAN FARM VISITORS BRING CASH

As a specific example, the Veneto region of Italy illustrates how some E.U. producers are incorporating agritourism into their farming operations while emphasizing high-value foods associated with the region and the local area. Located in northeastern Italy, the Veneto covers an area of 7,194 square miles of flatland (57 percent), hills (14 percent), and mountainous area (29 percent) and contains approximately 15,000 individual farms. Because the average farm size is 4.5 hectares (about 12 acres), producers must generate large per hectare returns to support one or more families without the need for off-farm employment.

Unlike the traditional system of transporting agricultural products to off-farm markets, agritourism brings customers to the farm. Veneto farmers who have included

agritourism in their farming operations are discovering that tourists are prepared to spend large amounts of money on vacations in rural areas. In addition to meals consumed on-site, tourists purchase locally produced wines, prepared meats, cheeses, jellies and jams, honey, baked goods, and crafts. In most cases, agricultural production remains the primary activity of the farm and agritourism is a secondary activity that adds value and marketing opportunities to the farm's crops and livestock production.

REGULATION KEEPS INDUSTRY IN CHECK

In part because of economic incentives provided to producers and to address concerns of the hotel and restaurant sectors, agritourism in Italy is heavily regulated. Italian farmers can provide one of three levels of guest services: self-service snacks/light meals; full-service meals; or "farm holidays" that include meals, sleeping accommodations, and recreational opportunities. In addition to each of these services, the farm family can sell products to be consumed later.

For each level of service, a percentage of the items purchased by tourists must be produced on the farm. Farmers providing self-service

snacks/light meals must produce 51 percent of the products they sell to tourists. On farms providing full-service meals (sit-down meals served by wait staff), at least 60 percent of the products sold must be raised on the farm, 25 percent must be raised on farms in the local area, and up to 15 percent can be purchased commercially. Because of a short growing season and less diverse production potential, high-altitude farms have lower requirements for on-farm and regional production. Many farmers provide full-service meals only on weekends because weekends are the most popular days for tourism, the farmer receives an immediate supply of cash, and the family can devote weekdays to other farming activities.

Farmers providing farm holidays can host up to 30 overnight guests per night for a maximum of 160 days per year. Recreational activities for farm holidays include hiking, horseback riding, exploring historical landmarks, wine-tasting classes, stomping grapes, and evening musical events. Statistics compiled by regional agritourism consortiums indicate that farm families generally host guests fewer than 160 days per year, in part to meet the labor demands for the rest of the farming operation.

Veneto farmers must obtain licenses to participate in agritourism. The farm operator must have two years of farming experience (also necessary to receive government funding), complete 100 hours of training, and pass an oral exam. The training includes courses on law, farm management, financial accounting, hygiene and sanitation, transporting and processing food products, and hospitality, all of which can be adapted to address specialty products of the area such as wines, cheeses, or fresh produce.

A limiting factor in Veneto agritourism is the cost of remodeling

Unlike the traditional system of transporting agricultural products to off-farm markets, agritourism brings customers to the farm.

buildings to accommodate guests. For example, one Veneto family converted a dairy barn into a building that houses the farm's cheese-making facility and sales area, a restaurant, and guest rooms. The dairy operation was moved to a nearby facility. Although the Italian government provides grants for these projects, demand greatly exceeds funding. Statistics indicate that annual income from agritourism ranges from 50,000 to 270,000 (in addition to other farm-related income), so some farmers are able to recover their initial investment relatively quickly.

LINKAGES FORMED WITH CONSUMERS

Over the past five years, agritourism in Italy has increased by 25 percent, mostly because of the increase in the number of farms offering overnight accommodations. As noted, farmers are encouraged to promote traditional culture, social customs, and foods. The emphasis on traditional foods is enormously attractive in Italy, where eating and sharing meals historically has played an important social role. At the same time, linking agritourism to local production appeals to modern consumers interested in alternative and economical tourism options, more information about the origin of the foods they consume, environmental responsibility and animal welfare, and health and nutrition. Producers in the

Veneto appear to be responding to this consumer demand by slowly moving away from conventional agricultural production, as evidenced by the increasing number of farmers engaging in agritourism and producing high-value food products to sell to farm visitors.

U.S. PROSPECTS FOR AGRITOURISM

There are many obvious differences between the Veneto example and U.S. agriculture. U.S. producers do not have the same long history on which E.U. farmers are basing linkages to regional and local foods; most U.S. rural areas are much less densely populated; and the E.U. system is laden with bureaucracy, regulation, and paperwork that would not be welcomed by U.S. farmers. However, developing a system of agritourism that ties locally produced foods to regional history, culture, and traditions might provide new opportunities for younger farmers. And improved returns in marginal production areas may be an effective way to reinvigorate rural communities in some areas. Many U.S. communities already are working to develop these linkages. As an alternative market, agritourism will need only a limited number of producers to supply the crops, livestock, and specialty foods consumed by tourists.

However, even for a relatively small-scale change to occur, many U.S. producers likely will require agricultural policies that provide greater incentives and less risk before they are willing to produce niche crops and specialty foods, participate in agritourism, or provide products for other alternative markets that will lessen their dependence on conventional production methods and commodity markets. ♦

China's Growing Market for Dairy Products

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China has one of the lowest levels of per capita milk consumption in the world, averaging just 5.6 kilograms (kg) per year in 2003. Consumption varies greatly by region, income level, and household location (rural or urban). Throughout the mid-1980s and early 1990s, milk consumption in urban China was stagnant, at about 4.8 kg per person, and rural consumption hovered at just 0.6 kg per person. While rural per capita consumption of dairy products grew weakly in the late 1990s, urban consumption of fresh dairy products has grown an average of 25 percent annually since 1997, reaching 15.7 kg per person in 2002. Household purchases of fluid milk, yogurt, milk powder, and ice cream are growing rapidly, and away-from-home consumption of cheese has risen with the tide of investment by western-style restaurant chains. The spectacular expansion of China's urban market for dairy products is driven by a combination of technology adoption, changes in retail supply chains, consumer trends, income growth, and government policies. This article summarizes findings on Chinese urban dairy markets emanating from a large CARD research project that analyzes Asian dairy markets.

A BRIEF HISTORY

Contrary to popular belief, dairy products have a long history in China, particularly in the coastal cities that were opened to foreigners in the late nineteenth century and in the pastoral regions in northern and western China. Dairy products are viewed as healthy, nutritious foods, but consumption had been hindered until recently by high prices, caused by the

lack of refrigerated transportation, inadequate household refrigeration, and limited production near coastal demand centers. Since the economic reforms initiated in 1978, several key investments in technology have increased the supply and demand for dairy products. First, introduction of modern processing technologies, including ultra-high temperature pasteurization, has greatly expanded the shelf life of dairy products. This, in turn, enabled inter-regional transportation of dairy products from surplus regions in the north to the population centers on the eastern coast. Second, the importation of dairy cattle and genetics from the United States, Canada, and Europe, as well as adoption of advanced feeding and management practices, has dramatically increased the productivity of modern dairy operations in China. Milk production in China doubled from 1996 to 2002, allowing China to surpass Australia and Japan as the third largest milk producer in Asia. Third, household incomes increased four-fold over two decades, enabling ownership of refrigerators to climb to 87 percent of urban households in 2002. Thus, households have the ability to properly store the increasingly available, high-quality milk and dairy products they purchase.

Recent innovations in retail marketing channels have also facilitated the rapid expansion of dairy markets in China. Until recently, retail markets for dairy products were localized. Home delivery networks organized by the local dairy processors dominated milk distribution and barred outside companies from significant access to consumers. However, the rapid development of regional and national supermarket chains in the 1990s and the advent of inter-regional shipments of dairy products have eroded the power of locally dominant firms and greatly increased competition. Moreover, the trend among Chinese supermarket chains toward centralized distribution and procurement will allow dairy processors to have access to consumers throughout China as individual chains expand operations. The importance of supermarkets in dairy product marketing is evident in the fact that more than half of urban Chinese households that reported milk purchases in recent surveys indicated making purchases at a supermarket. Likewise, 80 percent of households purchasing yogurt bought the products at a supermarket.

SURVEY RESULTS AND ANALYSIS

The surveys conducted in Beijing, Shanghai, and Guangzhou provide insights into the profile of urban

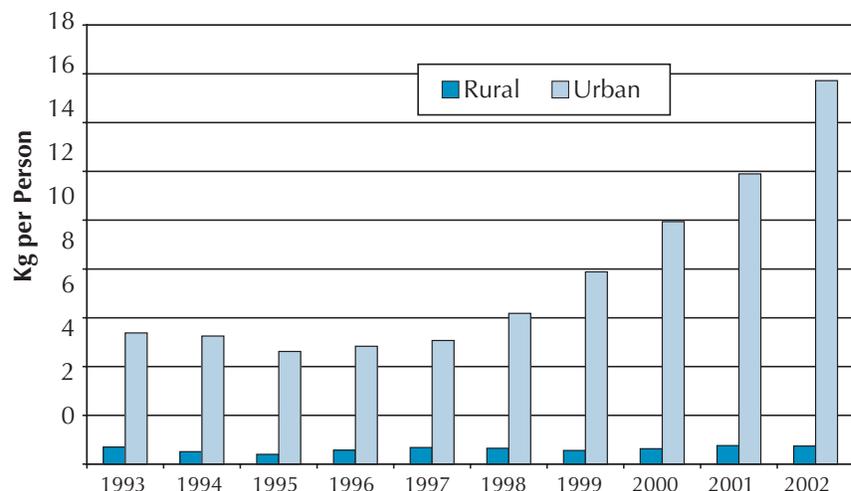


FIGURE 1. URBAN AND RURAL FRESH DAIRY PRODUCT CONSUMPTION

households purchasing dairy products. Virtually all of the households surveyed had refrigerators and purchased some dairy products, and more than 90 percent reported milk purchases. On a per capita basis, households in Beijing and Shanghai consume roughly twice as much milk than the households in the southern city of Guangzhou. Households in Beijing also reported above average yogurt consumption, and they were more likely to have increased milk and yogurt consumption in the last two years than were households in the other two cities. Chinese households purchase milk three times per week on average, buying four or five single-serving packages at a time. Other dairy products are purchased less frequently, averaging only one or two servings every two weeks. Only a handful of households reported purchases of cheese, but more than 30 percent of the sample purchased one or more cheeseburgers or other foods containing cheese each month, demonstrating the influence of the growing presence of western-style food restaurants on Chinese consumption patterns.

Statistical analysis of the data revealed that income, education, purchase location, and regional factors have, by far, the greatest impacts on dairy product consumption. Income, education, and purchases at supermarkets have a positive influence on the level of milk and yogurt consumption. Surprisingly, exposure to dairy-product advertising in news media has little effect on dairy purchase decisions, although in-store ads significantly influence yogurt purchases. The analysis also revealed that milk powder is an inferior good and is consumed more frequently by households living farther from city centers with elderly members or members that have had a doctor's recommendation to consume milk products for health reasons. Ice cream consumption is positively influenced by the household's proximity to a

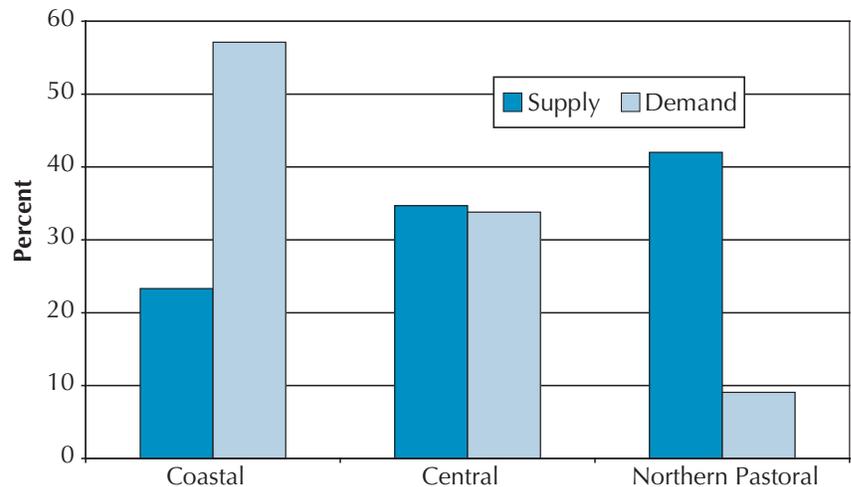


FIGURE 2. MILK SUPPLY AND DEMAND SHARES BY REGION

McDonald's restaurant (a proxy for the availability of western-style foods). The project findings confirmed previous research results based on aggregate dairy consumption data showing the positive impacts of education, better knowledge of nutrition, and greater exposure to western culture on dairy consumption. The few available estimates of income responses for milk and dairy consumption indicate that Chinese consumers tend to increase their dairy consumption faster than their income grows and faster than other food consumption.

Developments in China's dairy markets would not have been possible without the market reforms initiated by the Chinese government over the last two decades. In addition to providing the incentives for farmers to increase agricultural and food production, the market liberalization policies in the wholesale and retail sectors have enabled private and multinational firms to transform the distribution of food products in China. National, regional, and local government investments in every level of the dairy product supply chain have been critical to the expansion of milk production and the improved quality and variety of processed dairy products. The government of China has stated its intention to increase milk production by 15 to 18 percent in North China

by 2007 through additional investments in genetics, management, and processing. In addition to government support, China's dairy industry is also receiving substantial investments from multinational dairy firms based in Europe, Australia, and New Zealand.

OPPORTUNITIES

Our project's findings suggest that the recent rapid growth in dairy consumption in China is likely to continue well into the future, as household incomes rise. China's rapidly evolving domestic dairy product industry will expand to meet the bulk of those demands with the help of substantial domestic and international investment. China's imports of cheese and milk proteins are expected to increase in the coming years, but the greatest impacts on international dairy markets in the near term will be through the growing connections created by foreign direct investment in dairy product processing, distribution, and retailing. Dairy firms in Australia and New Zealand are likely to reap the greatest direct benefits because of their proximity to the Chinese market. Nevertheless, European and North American retailers and dairy multinationals are also gaining a foothold in this market to capitalize on its tremendous growth potential. ♦

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