

AGRIBUSINESS INDUSTRY STUDY REPORT 1996

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Right Away Foods, McAllen, TX
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ABSTRACT

U.S. agriculture is a \$750 billion-plus industry that produces 15 percent of the U.S. gross domestic product (GDP), employs 17 percent of the U.S. work force, and accounts for 13 percent of all U.S. processed goods. These numbers demonstrate the strategic importance of the industry. In today's world, economic wealth is as important as military strength in the calculation of power. The United States is blessed with a favorable climate, abundant resources, and strategic geography, but it is the agriculture business that translates these elements into competitive advantage and, in turn, national power. Because it is an exceptionally productive sector of the U.S. economy, agribusiness makes an important contribution to the nation's wealth.

INTRODUCTION

This report examines the agribusiness sector of the U.S. economy and demonstrates its contribution to U.S. power and security. As a key component of U.S. national power, agribusiness underpins national security. In our studies, we examined the nature of the agribusiness industry, its current condition, the challenges it faces, and prospects for the future. In addition, firsthand observations and discussions with both foreign and domestic agricultural experts gave us a deep appreciation of the agriculture system as a global enterprise. Agribusiness is a U.S. success story; its efficiency and production contribute a great deal to the U.S. GDP. In addition, agribusiness is a very fragile enterprise that in many ways is totally dependent on the whims of nature. The lesson we learned is that agribusiness is an element of national power that the United States must nurture and sustain.

THE AGRIBUSINESS INDUSTRY DEFINED

The agribusiness industry covers broad areas of the economy. It includes the farming sector but is much more than just the traditional "family farm." Agribusiness also includes the food and fiber processing and distribution system as well as the production of other non-food products such as cotton and tobacco. The major sectors of the agribusiness industry are described below.

Suppliers of Farm Inputs

This sector includes suppliers of fertilizer, seed, pesticides, fuel, and farm machinery as well as providers of specialized services, such as credit and information.

Farmers

This sector includes small as well as large operations. Significantly, large farms (those with over \$100,000 in gross sales of commodities) are responsible for 90 percent of farm output but make up a very small percentage of all farms.

Processors

Processors perform a wide range of activities, including meat packing, fruit and vegetable canning, and baking --all activities that prepare a raw food commodity, such as grains, vegetables, animal products, and fibers, for consumption. This sector is the major value-added component of the industry.

Wholesalers

Wholesalers distribute food and fiber from primary producers and processors to retailers and food service operations.

Food Retailers

Retailers include both supermarkets and the food service industry. Interestingly, today approximately 45 percent of the U.S. consumer's food dollar is spent on the latter.

Specialty Suppliers

This sector includes technical consultants, biotechnology suppliers, commodity traders, importers, and exporters, all of whom provide a wide range of services that assist producers in growing, distributing, and marketing products.

Exporters and Importers

Internationally, the import-export sector creates a significant positive balance of trade, \$18.9 billion. Total agricultural exports in 1996 will reach \$60 billion, of which \$25.9 billion will be value-added products.

CURRENT CONDITIONS

Trends in Sales

The United States, the world's top exporter of agricultural products, exports to more than 160 countries. The top 10 U.S. markets account for nearly 80 percent of all sales. In 1994, sales to the top 7 U.S. markets increased to record highs. U.S. exports to Japan, the largest U.S. market, increased 5 percent, while sales to Mexico and Russia increased by 11 percent and 30 percent, respectively (Department of Agriculture, 1996, 93). The total value of world trade in agricultural commodities and processed products grew at 8 percent annually from \$65.4 billion in 1972 to \$358 billion in 1994. The United States imports 4.5 percent of its processed food and ranks third in the world in this category. In 1994, the \$43 billion in U.S. purchases of agricultural products accounted for only 6 percent of total U.S. merchandise imports. World trade of processed food increased fivefold and commodities trade increased over fourfold from 1976 to 1996. The economic growth of developing nations and increases in per capita income should continue to expand the global market for U.S. commodities and processed food.

Supports

Agriculture policies encompass diverse goals: economic, environmental, educational, and community development and numerous others far removed from mainstream industrial policy. Many policy goals conflict with one another. Subsidies, which are most often pegged to output, induce farmers to plant too much of what is subsidized and too little of everything else. Excess production pushes prices down; farmers are paid to leave farmland idle in order to push prices back up. In turn, higher prices pinch farm exports, so they too are subsidized. Subsidies have

grown out of control in recent years, approaching or exceeding actual farm net income.

Farm subsidies in the Organization for Economic Cooperation and Development nations now cost around \$330 billion each year. This figure does not include the additional billions of dollars consumers pay for food. Based on the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) and the increased need to balance budgets, both the United States and Europe are beginning to move away from the market-distorting methods of agriculture support.

A few years ago a drastic overhaul of U.S. farm policy was thought to be impossible, especially during an election year. However, growing public demand for a balanced budget and the implementing legislation for the Uruguay Round of the GATT have made changes to the current system a necessity. Recent legislation drastically changes the way federal money will be distributed to farmers. First, farm subsidies will cease to be freely spent entitlements. Under the "Freedom to Farm Act" (the 1996 Farm Bill), subsidies will no longer be tied to output. Instead, every participating farmer will be put on a preset, seven-year schedule of declining subsidy payments based on the subsidies each farmer has received. The payment will gradually decrease over the seven-year period to allow the farmer time to compete effectively in the free market. Second, and even more surprising, subsidy payments will be completely detached from what farmers produce. No longer will farmers be required to grow too much or too little of any one crop just to keep their federal subsidy.

With the passage of the Freedom to Farm Act, U.S. agriculture has taken a giant leap towards returning to a free-market economy. Farm subsidies are anticipated to decrease from \$10 billion per year today to approximately \$6 billion in 1997 and \$4.3 billion by 2002. Most price supports and set-asides will also be phased out. In return, farmers will be able to plant any crop they want, in any quantity, or plant nothing at all.

The "Freedom to Farm Act" goes a long way toward breaking the subsidy cycle. The few subsidies that remain--for sugar, tobacco, and peanuts--will inevitably come under heavy scrutiny. The U.S. public is coming to understand that it is paying dearly for the self-imposed inefficiencies of

the U.S. agricultural industry. Eliminating farm subsidies will increase farm productivity, lower the cost of food to consumers, and improve the environment. It is also likely that, once the United States breaks away from farm subsidies, the European Union and Japan will face growing pressure to implement significant reforms.

Productivity Trends

U.S. optimization of land, labor, capital, and management resulted in a steady rise in farm productivity throughout the 1980s and 1990s. The largest productivity improvements occurred in output per unit of labor, feed, seed, and livestock. Farm labor productivity increased 133 percent from the 1982 base; in comparison, labor productivity in nonfarm industries increased 110 percent. Advances in technology; improved farm machinery, fertilizers, and animal health; and economies of scale inherent in larger farms have increased yields while reducing the labor required. Today there are only 2 million farms in the United States, compared with over 13 million in 1910. Fifteen percent of the farms produce 80 percent of the food supply. Advances in technology continue to increase crop and livestock yields.

Biotechnology. U.S. corn yields dramatically demonstrate the importance of biotechnology. After the development of double and single cross-hybrids, corn yields tripled from 40 to 120 bushels per acre from 1960 to 1990. Plant breeders conservatively estimate that at least 50 percent of this increase is due to improved genetics. Better farming methods, equipment, timeliness, and other inputs, such as fertilizers and pesticides, compose the rest (of the gain). Efficient pesticides, such as synthetic pyrethroids, and integrated pest management practices decreased domestic chemical use. Targeted application, reduction in planted acreage, and higher costs resulted in a decline in herbicide use. Fungicide use remains relatively stable.

New technology and management practices have increased beef, pork, and poultry production. For example, feed rations worldwide now routinely have uniform protein, oil, starch, and moisture contents. Somatotropin, a protein hormone produced naturally in the pituitary gland of cattle, increases feed efficiency and milk production and reduces fat content in livestock meat. Health technology has produced vaccines and

therapeutic remedies that reduce livestock disease and the use of antibiotics, but technological gains can also harm the industry. For example, some consumers have expressed concerns about antibiotics in milk and the future use of genetics.

Organizational structure. Mergers, consolidation, vertical integration, competitive networks, and larger farms are changing the organizational structure of food processing and manufacturing. Mergers and acquisitions are causing grain and soybean processing to become more concentrated as a result of mergers and acquisitions; in fact, the 12 largest flour milling firms in the United States produced 67 percent of the flour in 1973 and 80 percent in 1990. The resulting larger, vertically integrated food companies are more capable of supporting biotechnology and information technology than their smaller counterparts are. For example, large poultry and hog processors provide feed, veterinary supplies, management, and technical information in direct contracts with poultry and hog farmers. In the more than 16 percent of large hog farms that today are vertically integrated, a goal is to produce standard-sized poultry and hogs, which makes processing automation easier.

Technology is the key to developing new processing and marketing methods that will boost productivity in the food industry. For example, in 1920 Domino Sugar needed 500,000 employees to refine 2 million pounds of sugar. In 1996, assembly-line improvements such as automation, computer system productivity, and others help 700 employees produce 6 million pounds of sugar a day.

Supermarkets were the primary food distribution system throughout the 1960s and 1970s. Their share of total food sales has steadily declined from a high of 73 percent in 1980 to 30 percent in 1994. Today, the food distribution share is divided among restaurants, supermarkets, and convenience stores, and the fastest growing food retail sector is the fast-food restaurant business. As working families have increased the demand for convenient and fast food, their expenditures for food away from home make up 45 percent of the U.S. consumer food budget, up from 35 percent in 1973.

Profitability

The efficiency of the U.S. agriculture system will continue to keep per capita spending for food products as a share of income low, even after subsidies are eliminated. The farm value of the final consumer product (the farm price before processing, marketing, and retail markup) decreased from 35 percent in 1984 to 24 percent in 1994.

The fast-food industry has become especially profitable. Labor costs are dropping in the fast-food arena thanks to enterprises that reduce the need for labor by using prepared and semiprepared foods. Restaurants have a greater margin of profit than grocery stores. Some large food manufacturers have acquired fast-food restaurants and supplied them with their own processed foods. The fast-food industry continues to grow and in 1996 generates over \$60 billion in sales and serves 50 million people daily.

Safety

Food-borne illnesses continue to have a significant impact worldwide. In the United States, millions of people become ill from microorganisms and toxins in food every year. A specific quantification of the effects and costs of food-borne illness is extremely difficult because of the process of reporting illness to authorities and inherent problems in identification of the transfer media. Meat and poultry products remain the most important sources of food-borne diseases. For some, particularly the elderly, young children, and those with depressed immune systems (e.g., people with AIDS), food-borne illness can represent a serious and even life-threatening situation.

The annual cost of foodborne illness in the United States is estimated to be billions of dollars. While it is not possible to eliminate all pathogens from the food supply, modern risk reduction and prevention strategies can significantly reduce the threat of foodborne illness.

Currently, a system of end-product testing, set up in 1938 by the Federal Food, Drug and Cosmetic Act to target agents known to exist at that time, ensures food safety. The U.S. Food and Drug Administration (FDA) and the U.S. Department of Agriculture (USDA) are considering a

new strategy called the Hazard Analysis Critical Control Point approach to food safety. This system, which relies on in-process evaluation and correction of hazardous conditions, will enable a safer product to reach the market with less government intervention.

Information Technology

Information systems are revolutionizing the agribusiness industry. In retail markets checkout scanners provide direct feedback on consumer demand; computerized systems use electronic price tags to easily change prices and link suppliers, farmers, merchandisers, processors, and retailers. Market evaluations that took months can be completed in days.

Another development in information technology is sensor technology, which reduced cost and increased consumer safety through precisely monitored fertilizer and chemical applications. Large farms use information systems for livestock and crop management, and factories use computerized information systems to (1) produce multiple products based on consumer demand, (2) increase processing, (3) increase productivity, and (4) identify consumer desires. For example, Campbell Soup reduced its production costs by 20 percent, space requirements 30 percent, and inventory 60-70 percent.

CHALLENGES

The U.S. agribusiness industry faces three significant challenges in the coming years: accommodating to the evolving free markets and the globalization of agricultural systems; balancing applied breakthroughs in biotechnology with the need to sustain biodiversity in agriculture, thereby increasing food production without degrading the planet's environment in the process; and dealing with industrial, national, and global food shortages.

Free Markets and Globalization

The increase in the buying power of the emerging worldwide middle-class is triggering an explosion in demand for improved diets. This phenomenon is perhaps best illustrated by the recent skyrocketing of

world prices for grain products, a great deal of which are used to feed livestock.

The long-run prediction for stability for the U.S. agricultural sector is problematic. The questions are: is the current boom in demand a short-term phenomenon? Will the revolutionary changes taking place in the global economy fuel for long-term bull market for agricultural products, thus propelling trade volumes and prices higher for U.S. farmers? Or will the market, flooded by higher production levels, take a downturn and precipitate the collapse of the U.S. agricultural infrastructure, necessitating intervention by the U.S. government once again?

Although the answers to these questions are unknown, all indicators point toward a lengthy period of agricultural trade expansion. The challenge for U.S. agriculture will be to manage risk to sustain its viability and growth over the long term in an increasingly deregulated, global environment.

Biotechnology and Environmental Protection

The world's population is expected to double by 2030 to 12 billion. Some analysts question whether increased food production can keep pace with population growth without seriously degrading the planet's environment in the process. The disappearance of tropical rain forests, wetlands, and other vital habitats will accelerate unless agriculture becomes less taxing on the environment.

Biotechnology has the potential to play a big role in resolving these problems. Genetic research will lead to improved livestock and seed grains, higher protein levels in forage crops, and built-in crop resistance to disease, insects, viruses, extreme temperatures, and even droughts. In addition, biotechnology will make foods healthier and more nutritious.

The ultimate determinant of success for U.S. and world agriculture may be how well farmers manage ever-advancing technologies in ways that increase productivity while protecting the environment. This goal should be within reach of richer countries, but it will present monumental challenges for developing nations, where capital for investment in biotechnology and environmental protection is limited.

A major challenge for the world's agricultural research community will be to find ways to help less developed countries, where poverty frequently causes farmers to jeopardize the health of the environment. Meeting this challenge successfully will require fostering the practice of sustainable agriculture, that is, farming that meets rising demand at economic, environmental, and social costs consistent with rising incomes.

In an increasingly global community, the developing world remains most in need of biotechnology's innovations. However, current research is concentrated on high-value crops grown in the industrialized world. A major challenge will be to find ways to raise incentives and provide technology transfer for farmers around the world in order to better conserve resources while increasing agricultural productivity.

Feeding the Hungry

Despite agricultural advances, the specter of hunger and starvation still hangs over some parts of the world. Some experts are convinced that the major problem resides in Africa and South Asia, where many countries employ marginal agricultural practices and have exploding populations but little or no economic growth potential.

In Africa, which suffers from a poor climate, a lack of public investment in agricultural infrastructure, rural poverty, and governmental corruption, food production is predicted to remain well below the rate of population growth. For example, between 1985 and 1993, crop yields in many densely populated areas of Africa actually fell. Among 41 African countries, yields of cereal declined in 13, and yields of root crops and tubers declined in 15. African farmers, thus forced to abandon traditional farmlands, have resorted to cutting down forests to make room for new planting fields. As a result, Africa loses nearly 12 million acres of forest every year. In South Asia, populations continue to grow at dangerously high rates, while problems with soil degradation and water pollution contribute to malnutrition in many sectors of the population. How the United States and the world community plan to deal with this impending disaster remains to be seen (Paarlberg, 1996).

OUTLOOK

In the global marketplace, a multitude of world suppliers are available to meet the food needs of a nation. Today's nations no longer have to fear that another country will use the withholding of food as a means of pressure. Nations can now achieve food security by using multiple suppliers while focusing their limited resources in areas that will provide them with a comparative advantage in the world economy. The United States, whose geography, weather, and government-industry partnership has permitted it to develop a strategic agricultural industry with a comparative advantage over most nations of the world, must support a policy of food security that assures all nations access to food supplies.

Food's availability or scarcity directly affects a nation's ability to concentrate its political, economic, social, and military energies on its primary objectives (Morgenthau, 1985). As the provider of food domestically and worldwide, agribusiness's ability to support U.S. national interests with the necessary food resources gives the nation the power to influence world events to its benefit. The United States is the world's largest donor of foreign food aid. In FY 1994 and 1995, the United States spent \$3.4 billion each year on peacekeeping and humanitarian operations (Institute for National Strategic Studies, 1996, 134). The U.S. ability to call upon agribusiness to support long-term humanitarian relief operations without affecting its own food consumption demonstrates the strategic role agriculture plays in meeting the nation's objective of maintaining global and regional stability.

World Population Trends

The ability of the United States to affect global stability in the future will depend on the rate of growth of the world's population and the agricultural industry's continuing success in increasing productivity. By early in the 21st century, the world's population is expected to double to 12 billion. Unfortunately, 93 percent of this population growth is expected to take place in regions least able to cope with the increase.

Africa's population is projected to grow from 747 million in 1995 to 1.6 billion by 2025; Asia's, from 3.4 billion to 4.9 billion; and Latin America's, from 584 million to 794 million. The overall share of

population for developing and underdeveloped countries will increase to 83 percent, while the share of world population for developed nations will decrease from 24 percent to 17 percent.

Demand

Although the world's population is expected to increase, the rate of growth is now declining and is projected to do so throughout the 21st century. During this decline, positive economic growth will continue in the developed and developing nations. The resulting increase in consumer purchasing power will drive the demand for better diets and higher-quality food products.

As demand for agricultural products continues to rise, competition for market share will intensify as a result of the industry's inability to control prices and profit margins. Companies will increase their market share through efficiency. Farms will continue to increase in size and will consolidate as high-cost farmers drop out. As technology enhances productivity, the resulting decline in labor requirements for agriculture will be offset by increases in employment in food processing, driven by consumer demand.

To meet the demand of the marketplace for increased productivity, the agribusiness industry will continue to consolidate and integrate in the foreseeable future. In 1994, mergers and leveraged buyouts rose for the third straight year, and food processing ranked seventh in the value of mergers among all manufacturing industries. Food wholesaling and retailing ranked second and fourth in their respective industries for a number of mergers in 1994.

Economy

The markets are now responding more to economic signals than to government decisions. Global trends, rising incomes, demand for higher-value, consumer-oriented products, and the spread of the free market system are strengthening the demand for U.S. agricultural products today and will continue to do so into the foreseeable future.

The marketplace is increasingly a global one as agribusiness implements new technologies. Because of these technologies, buyers and sellers around the globe now have almost instantaneous market information and the United States has been able to overcome the economic, political, and social barriers of past trade relationships. The ability to compete on the basis of price, quality, and performance is becoming even more important.

Trade

The demand for exports is projected to expand markets further, continuing the upward trend in U.S. food sales abroad. The result will be additional jobs and income for producers, food processing and transport companies, and associated manufacturing firms.

Of particular interest to the United States is the increase in export of high-value, intermediate, and consumer-oriented products. High-value exports grew to \$26 billion in 1994, representing 59 percent of total U.S. agricultural exports, whereas exports of bulk commodities decreased by 5 percent. However, the bulk commodity trend is expected to reverse as the Asian-Pacific Rim economies increase their demand for bulk grain as well as meat products. In addition, of the top 10 markets that account for 80 percent of all U.S. exports, 7--Japan, Canada, Mexico, Taiwan, Hong Kong, the Russian Federation, and Algeria--imported record amounts of U.S. food products in FY 1994. This expansion of the global marketplace has given U.S. companies an incentive to acquire overseas food-processing businesses. Total sales from these firms are growing faster than exports from the United States, and continued record sales of U.S. agricultural products are expected well into the 21st century.

Technology Improvements

Biotechnology will play a greater role in increasing the productivity of plants and animals by enhancing their efficiency in converting inputs into food and fiber products. Future developments are expected to include products that are drought, flood, and extreme-temperature resistant. Biotechnology will also reduce the use of insecticides and herbicides, make food more nutritious, reduce health risks and groundwater contamination from pesticides, and allow the use of minimum-till agriculture, which minimizes erosion.

The application of biotechnology will also aid developing nations in boosting their agricultural productivity. Based on increasing food demands, the plant biotechnology market is expected to grow worldwide to \$2 billion per year by 2000 and \$6 billion per year by 2005 ("Plant Biotech," 1995, p. 25).

Another technological source of increases in farm productivity will be farmers use of the information superhighway. For example, in precision farming, which involves linking information about growing conditions to sophisticated, computer-run farm equipment, farmers will be able to treat different areas within a single field and monitor yields during harvesting, all based on computer analysis. Computer modeling will support an increase in dairy production by predicting the genetics for several traits required for a cow to be maximally productive. As the agricultural industry depends more and more on real-time information for decision making, productivity will increase even more and the impact on the environment will decrease.

GOVERNMENT GOALS AND ROLE

Because the products of agriculture are essential to the survival of society, government has a clear stake in the development and advancement of agriculture. Just as agriculture, and the social, economic, and technological factors that surround it, have evolved, the proper roles for government in shaping the direction of agribusiness have changed. To retain the worldwide competitive edge, U.S. public policy toward agriculture must protect the environment, foster research, promote health and product safety, and provide access to world trade.

Environment

In the past, U.S. farm commodity programs that supported eligibility for price and other income support programs encouraged monocultural practices--the production of a certain crop every year on the same land. Studies suggest that monoculture degrades water quality and leads to soil erosion, as it promotes the intensive use of agricultural chemicals and other environmentally unfriendly production practices. In 1992, a national water quality assessment conducted by the Environmental

Protection Agency (EPA) found that the majority of contaminants came from nonpoint, agricultural sources. The 1996 Farm Bill partly solves the problem by giving farmers more freedom to farm any crop in the amount they believe will give them the best return. This approach will likely improve agricultural environmental quality by moving farmers away from monoculture.

In 1995, the U.S. General Accounting Office (GAO), after a study of nonpoint source pollution in 618 federally funded, watershed-based projects, reported that a blanket solution to all water quality problems was not effective. The GAO team stressed the need to be flexible in applying pollution control measures in each watershed.

Research

Research, which is more sophisticated and more expensive to conduct than ever before, plays a major role in meeting the challenges facing U.S. agriculture in the coming decade: increasing competitiveness, accommodating the public's demand for safe and nutritious foods produced under environmentally friendly conditions, and increasing productivity of U.S. agriculture. In the past, public funding for agricultural research generated a highly productive and efficient food and fiber sector that has been the key to making U.S. agriculture the most productive and competitive in the world. Only through research will average crop yields increase enough to feed the world's population, which is expected to double by early in the next century.

Agricultural research is a public good because the benefits realized accrue to society. Every tax dollar invested in the U.S. agricultural system has paid back at least \$1.35 (U.S. Department of Agriculture, 1996, p. 158). These returns have been passed on to the consumer through lower prices and increased international competitiveness for farmers.

Agricultural research should be accountable in economic terms as well as in terms of its potential effect on the environment and public health. Therefore, publicly funded research institutions should use a systematic, easily understood method of setting priorities. Such a system would allow the full spectrum of biological, physical, and social sciences to collaborate in addressing the impact of research.

Today's agricultural research policies must be linked to policies for health and product safety, the environment, trade, and domestic farming.

Health and Product Safety

Food quality and safety issues challenge both the public and policymakers. Because they cannot judge food quality and safety based entirely on visible characteristics, consumers must rely on the credibility of standards set by the government. The primary food safety concern is whether a particular product causes either chronic or acute health problems. U.S. government policies on health and product safety must establish effective methods of quality assurance. The issue is how and to what standard government should attempt to ensure food quality.

The current system, which spreads responsibility for regulating food safety among several agencies, is problematic. The FDA is responsible for processed foods, meat and poultry are primarily regulated by the USDA, and the EPA determines the legal uses of pesticides and establishes the maximum residue permissible on foods. Essentially, safety standards for processed and unprocessed foods are inconsistent. Whether the United States can establish and implement a comprehensive food policy that includes permanent food quality legislation outside the agricultural framework depends on the strength of special-interest groups, the political organization of congressional committees, and the public.

Trade

The Uruguay Round of the GATT went into effect in January 1995 and is to be fully implemented by 2000. The United States (as well as other signatory nations) was allowed to begin to phase in trade barrier reductions at such high levels that present domestic agricultural policies are relatively unaffected. More important, the successful conclusion of the Uruguay Round cleared the way for negotiations involving 14 other areas of international trade, with benefits to world income anticipated at more than \$200 billion. This expected growth may benefit U.S. agriculture as the bulk of the world's consumers--located in the less developed countries--look to add quality, variety, and convenience to their diets.

Determining which programs offer the highest return is becoming more and more important. The question is what the best use of government funds is and how much public and private interests gain or lose from changes in various export market programs. For example, the United States' traditional export strength is in bulk commodities, but those markets are shrinking. The export markets that are growing involve high-value, consumer-ready, and semiprocessed agricultural products., even as budgetary pressures to reduce public funds supporting agriculture will continue.

The federal government should continue to participate in multilateral and bilateral trade negotiations in order to reduce barriers to free trade, including trade in agricultural products, monitor trading partners for noncompliance with the provisions of the Uruguay Round, and seek remedies for violations through the World Trade Organization. The U.S. government should collect market intelligence and make it available to producers and processors. Export promotion programs, to the extent that they are allowed under the Uruguay Round, and credit assistance should target high-value products in emerging markets.

Domestic Farm Policy

Unlike previous farm legislation, the 1996 Farm Bill fixes payments to farmers and decouples those payments from farm prices. Consequently, the cost of farm subsidies should decline from \$10 billion a year to about \$4 billion a year, according to estimates prepared prior to the passage of the bill. The intent of the new policy is to reduce the impact of agricultural subsidies on the federal budget and allow market forces to determine price and supply. The bill establishes a Commission on 21st Century Production Agriculture that will evaluate how well the new policy supports economic viability in farming by assessing food security, changes in land values, and progress on regulatory and tax relief for agricultural producers. The commission will make recommendations to Congress about the appropriate role of the federal government in agriculture by January 1, 2001.

In our view, to keep U.S. agribusiness ahead in the international arena well into the next century, the U.S. government should (1) continue to

promote global free trade to ensure access to international markets, (2) impose strict environmental regulation within the agricultural sector, and (3) allow for federal government financing of basic and applied agricultural research to ensure high productivity through the next century.

CONCLUSIONS

Today economic wealth is just as important as military strength in the calculation of national power. The United States translates favorable elements of climate, natural resources, and geography into national power. U.S. agribusiness is exceptionally productive and contributes enormously to the nation's economic wealth. The more efficient agriculture is, the more resources become available for other national priorities. Thus, agribusiness strengthens the nation.

However, agribusiness will face challenges in the coming years. While agriculture now provides a favorable balance of trade, new economic realities such as free trade will force U.S. agriculture to work to maintain its competitive edge. Pressure will come especially from the developing market economies in central Europe and the Commonwealth of Independent States, which have enormous agricultural potential. Another significant challenge is the increasing gap between the developed countries that have an abundance of foodstuffs and the less developed countries, in which people are starving.

BIBLIOGRAPHY

Institute for National Strategic Studies. 1996. *Strategic Assessment 1996: Instruments of U.S. Power*, Washington, DC: National Defense University Press

Morgenthau, Hans J. 1985. *Politics Among Nations: The Struggle for Power and Peace*, New York: McGraw-Hill.

Paarlberg, Robert L, 1996, "Rice Bowls and Dust Bowls," *Foreign Affairs* (May/June), 127-132.

"Plant Biotech: Transgenic Crops Head to Market," 1995, *Chemical Week* (September 27).

U.S. Department of Agriculture, 1996, *Agricultural Fact Book, 1996.*, Washington, DC: GPO.