AY 2003-2004

AGRIBUSINESS

INDUSTRY STUDY FINAL REPORT

SEMINAR 1

The Industrial College of the Armed Forces
National Defense University
Fort McNair, Washington, D.C. 20319-5062

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
2004	**N/A**	**-**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
AY 2003-2004 Agribusiness: Industry Study Final Report	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **The Industrial College of the Armed Forces National Defense University Fort McNair Washington, DC 20319-5062**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
The original document contains color images.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**UU**	**42**	

ABSTRACT: Although not intuitively obvious, agribusiness remains a critical component, not only in the overall U.S. economy, but to national security as well. American consumers often take food for granted, demanding more variety and convenience from the nation's food supply system. Even though the U.S. is blessed with an abundant food supply, any nation unable to feed its citizens or its armies puts its own sovereignty at peril. Much more than the Norman Rockwell version of an American farmer, agribusiness is big business, encompassing everything from the "farm to the fork." Technological innovations over the past century have led to an unprecedented increase in productivity. As agribusiness becomes more global, it faces increased competition, questioning the industry's ability to sustain itself into the next century. In order to meet the challenges, agribusiness is turning more to vertical and horizontal integration, technology and government intervention to remain competitive. This study assesses the industry by focusing on the "value chain," the trends, the challenges, as well as the opportunities faced throughout agribusiness. As a matter of key importance to the industry, this report also focuses on food safety/agro-terrorism, biotechnology, trade and the changing American eating habits.

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PLACES VISITED

Domestic Briefs:
Center for Technology and National Security Policy, Washington DC
Embassy of Brazil, Trade Advisor, Washington DC
Embassy of Chile, Agricultural Attaché, Washington DC
National Cotton Council, Washington DC
Office of the United States Trade Representative (USTR), Washington DC
United States House of Representatives (House Agriculture Committee), Washington DC
United States Department of State (Agricultural Trade Policy), Washington DC
United States Department of Agriculture (Foreign Agriculture Service), Washington DC
United States Department of Agriculture (Sustainable Agriculture), Washington DC
White House Homeland Security Council, Washington DC

Domestic Travel:
Adams County Extension Service, Middletown, PA
APL Limited, Oakland, CA
Beltsville Agricultural Research Center (USDA), Beltsville, MD
Beaulieu Vineyards, Rutherford, CA
CalCot Marketing Cooperative, Bakersfield, CA
Chicago Board of Trade, Chicago, IL
Customs, Department of Homeland Security, Oakland Port, CA
Duda Farms, Salinas, CA
Hardin Farms, Danville, IN
Heinemann's Bakeries, Chicago, IL
Hendricks County Extension Office, Hendricks Co., IN
Hollabough Brothers, Inc., Biglerville, PA
Kern County Farm Bureau, Bakersfield, CA
Kern County Planning Commission, Bakersfield, CA
Kraft (Nabisco) Bakeries, Chicago, IL
Mason Dixon Farms, Gettysburg, PA
Paramount Export Company, Oakland, CA
Penn State University, State College, PA
Purdue University, Purdue, IN
Randolph Farms, Delano, CA
Rice Fruit Co., Gardners, PA
San Joaquin Municipal Utility District, Delano, CA
Slaybaugh Farms, Biglerville, PA
St. Supery Vineyards, Rutherford, CA
Sunview Farms, Delano, CA
Sysco Produce, Salinas, CA
Tanimura & Antle Produce Processing, Spreckels, CA
Western Farm Service, Delano, CA

International Travel:
AgriCom's Packing (Clementines), Polpaico, Chile
AgriCom Avocado Orchard, Hijuelas, Chile
AgroSuper's Pork Processing Plant, Rosario, Chile
AUD Irrigation System, RS, Brazil
Brazilian Institute for Sustainable Development and Environmental Law, Porto Alegre, Brazil
Chilean Exporters Association, Chilean Fruit Sector (ASOEX), Valparaiso, Chile
Ecological Reserve of Aparados da Serra/Itaimbezinho Canyon, Brazil
Empresa Bunge Alimentos (Soy Bean Processing), Porto Alegre, Brazil
ExpoAgro, Main Chilean Agricultural Fair Inaugural Ceremony, Santiago, Chile
Instituto Riograndense do Arroz (IRGA), Porto Alegre, Brazil
Joint Inspection Site SAG-USDA/APHIS, Santiago International Airport, Chile
La Rosa SOFRUCO (Orchards, fruit processing plant and winery), Rosario, Chile
Ministry of Agriculture (ODEPA), Santiago, Chile
Ministry of Foreign Affairs (DIRECON), Santiago, Chile
Poultry and Pork Producer Associations, Santiago, Chile
Reichert Calcados Ltda. (Tannery & Shoe factory), Feliz, Brazil
Universal Leaf Tobaccos Ltda.(Tobacco processing facility), Santa Cruz du Sol, Brazil

THE AGRIBUSINESS INDUSTRY

"So an army perishes if it has no equipment, it perishes if it has no food and it perishes if it has no money."

- Sun Tzu

Introduction

At first glance, it may not be intuitively obvious that agribusiness plays a critical role in maintaining our national security. Other industries such as weapons, land combat systems or aircraft have direct links to the national military apparatus and generate important strategic implications on how our nation trains, equips and organizes our forces for war. Agriculture and agribusiness, on the other hand, plays a much more fundamental role in a nation's security: the ability to feed its citizens and armies. Arguably, no other industry is more important to our nation's survival. No nation is willing or desires to give up its access and distribution of food to another nation. Almost nothing is more strategically important to a nation's survival. However, no industry is independent in an interdependent global economy. Agribusiness cuts across an array of industries studied at the ICAF. Transportation, environment, biotechnology, manufacturing, education and other industries play an intricate role in the productivity and sustainability of agribusiness.

Although agriculture accounts for only 0.7 percent of our nation's Gross Domestic Product (GDP), agribusiness is much more than farming. When you include the greater agribusiness system such as food manufacturing and processing, wholesaling, retailing, food service and distribution, the total food and fiber system accounts for nearly 13 percent of our nation's GDP.[i] Americans simply take it for granted that food will always be on a grocer's shelf and have little understanding how much effort, resources and inputs go into transforming the raw food product into the convenient, pre-packaged, ready-to-eat meal at the local grocery store.

As part of our five-month study of the agribusiness industry at ICAF, we studied the various components including farming, processing, retailing and distribution. This paper represents an executive summary of our research and attempts to define agribusiness and capture the dynamics, trends and opportunities of the industry. In light of globalization, we not only looked at the industry from a domestic perspective, but also viewed it from a global agricultural partner's (Chile) and competitor's (Brazil) perspective. This paper steps through the various links of the value chain with emphasis on how technology, productivity, integration and the environment are constantly changing the face of agribusiness and how the government attempts to balance the inequities of agriculture against market forces. Finally, we wrap up with four essays focusing on some of the more critical issues facing agribusiness today: biotechnology, agro-terrorism/safety, trade and consumer eating habits.

"Agriculture is the foundation of manufacture and commerce."

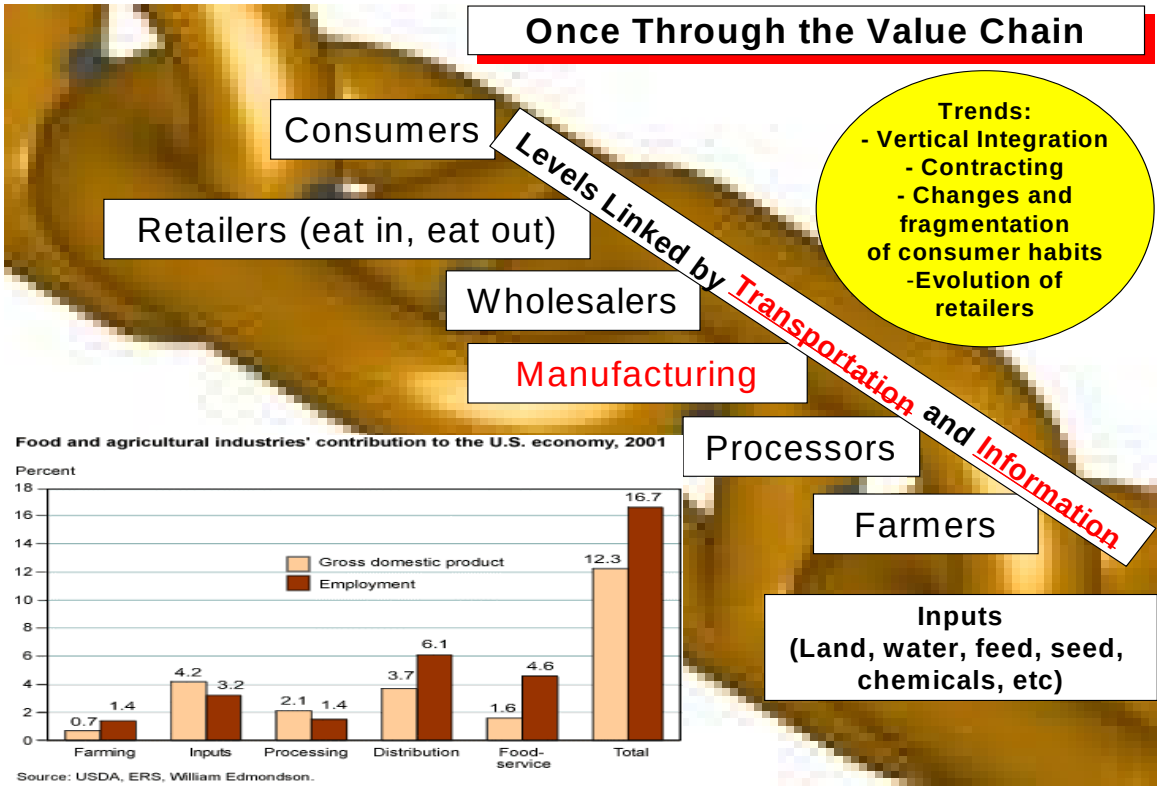
- U.S. Department of Agriculture (USDA) Motto, 1862

Agribusiness Defined

The term "agribusiness" normally conjures up images of the Marlboro Man working on his large ranch or the Norman Rockwell version of a small family farm struggling to make a living off the land. While these mythical images are indeed an important part of agribusiness, it goes well beyond the small family farm. In reality, agribusiness encompasses several different activities or a series of value-added steps known also as the "value chain." The value chain includes a wide range of processes from the inputs that a farmer uses (i.e., fertilizer, water, chemicals) to the "middle-men" (i.e., processors, manufacturers and wholesalers) who take the raw farm products and transform them into usable end items by packaging, marketing and transporting them to the retailers (i.e., grocery stores, restaurants) and consumers as finished products ready for consumption. In other words, agribusiness simply includes everything from the farm to the fork.

For the purpose of this discussion, we not only studied the various sectors within the value chain, but also reviewed the links between the sectors such as transportation, technology and information.

The Value Chain: U.S. Food Marketing System



The "value chain" or the food marketing system plays a major role in the overall U.S. economy. When accounting for the entire food and fiber system ("farm to the fork"), the food marketing system contributed nearly 13 percent of U.S. GDP in 2000.[ii] Since 1960, disposable income growth has outpaced increases in food costs leading to a continuous decrease in the percentage the public spends on food. Today, consumers spend nearly 10 percent of their income on food compared to nearly 18 percent in 1960.[iii]

In studying each of the value chain links, it becomes apparent there are several distinct trends. First, efficiency gains in the food marketing system continued throughout the 20th century not only due to the abundant supplies and varieties of food products, but the continued vertical and horizontal integration as well. Both vertically and horizontally, consolidation in each of the links or stages has led to: increased bargaining power, maintaining market outlets, access to consistent, high-quality raw materials, capturing efficiency gains and lower procurement costs, and the ability to compete with innovative retailers and distributors such as Costco and Wal-Mart.[iv] Mergers and acquisitions are forcing the links to become interdependent throughout the value chain. Second, as new technology is applied throughout the value chain, it has improved information flow that, in turn, helps with scheduling and inventory. These improvements reduce costs and greatly improve efficiency. Third, competitive pressures and small margins are forcing farmers to deliver the right product at the right time. Food manufacturers and retailers are demanding niche or specialized products from farmers such as organic foods as well as new ethnic diverse products to meet the demands of their customers. Also, consumers are no longer willing to settle for fresh grapes only during their seasonal producing months. Consumers want and expect their favorite fruits and vegetables all year round. Finally, globalization and the international markets offer an alternative to the mature domestic market for each of the links in the food system. The United States remains the world's largest importer and exporter of processed food while U.S. companies continue to expand overseas.[v]

The next section specifically looks at each stage of the value chain and describes how the ongoing changes in competition, integration, technological innovation, productivity and globalization have dramatically shaped and altered the course of agribusiness in the 21st century.

"It's all about managing risk!"
-- Marko Zaninovich, Sunview Farms

Inputs

As a critical link in the agribusiness value chain, inputs include the elements required by farmers to produce the raw food products that our nation depends on. They include elements such as land, water, feed, seed, chemicals and labor. Without these inputs, agriculture cannot exist. Not only are inputs fundamental to farming, technological improvements made to herbicides, insecticides, irrigation, seeds, etc., have significantly contributed to our nation's increased productivity and risk reduction in our food supply.

Labor. Since World War II, labor input in agriculture and the overall number of farm workers have dropped progressively as technology advanced.[vi] Although farm workers make up less than 1 percent of all U.S. wage/salary workers, they remain a vital input in farming especially during critical harvest periods.[vii] The makeup of the typical hired farm worker has also changed. In 2001, over 80 percent of the farm workers were male and nearly 50 percent were Hispanic.[viii] Over half hadn't completed high school and over a third weren't U.S. citizens.[ix] At the same time, hired farm workers are some of the lowest paid workers, with median earnings of $345 per week in 2001.[x] Despite what we heard from many farmers and farm advocate groups, most farm laborers work long hours, often in unsafe conditions, while receiving few benefits. Some experts believe that as many as 50 percent of farm workers are in

the U.S. illegally which may impede their ability to get better jobs. In addition to immigration policy, cultural differences, lack of education and other larger societal issues may also impede their progress.[xi] Although farm workers are some of the lowest paid in America, labor remains a significant input cost to the farmer as well as to entire agribusiness sector in general. During a visit to a tannery and shoe factory, we saw middle to high-end brand name shoes such as Jones of NY® and Nine West® being manufactured in Brazil where labor costs are relatively low. For better or worse, globalization is forcing U.S. business to be more efficient, cut costs or move operations offshore in order to remain competitive. In Chile, farmers are expanding and planting avocados trees along steep mountainsides. Since it's very difficult for machinery to gain access to the crop in these areas, Chilean farmers must rely on cheap labor to harvest the crop.

Besides social costs associated with farm labor and the migration of manufacturing jobs overseas, there remains the greater strategic concern of labor as a major input cost. As we heard repeatedly throughout our study, countries with cheap and abundant labor like China are placing considerable pressure on U.S. agribusiness and agriculture to minimize labor costs through technology and reducing wage scales. American farmers are relying on technology to reduce the high cost of labor in the U.S. in order to compete globally. Throughout the San Joaquin Valley and elsewhere across the U.S., farmers are using machinery whenever possible to harvest their crops. If U.S. farmers are to remain competitive, they must increasingly use technology to drive their labor costs downward despite any secondary social costs that may arise.

Water. Water remains one of the most important inputs for agriculture, consuming as much as 80 percent of total water usage in the U.S.[xii] As a whole, the U.S. has an abundant supply of freshwater with as little as seven percent actually used from renewable sources for farming, home use and industry.[xiii] However, the so-called abundance of water isn't evenly distributed in the U.S. In the drier Western States, agriculture consumes over 90 percent of available water and is often competing with growing water demand from urban encroachment as well as increasingly restrictive environmental regulations.[xiv] Irrigated farmland in the U.S. has expanded over 40 percent since 1969, and specifically in the West, has become a significant input cost for many farmers.[xv] Nationally, costs for groundwater averages $32 per acre and off-farm surface water (i.e., rivers and lakes) about $41 per acre.[xvi] However, these costs don't reflect the true cost for water since equipment to access groundwater can be costly and much of the off-farm surface water is heavily subsidized. As we observed in the San Joaquin valley, subsidized water and public water infrastructure projects have transformed the vast desert of California into one of America's most prized agricultural centers. In contrast, we visited an alternative approach in Brazil where a water and irrigation infrastructure project was run by a private organization. Water in the southern Brazilian state of Rio Grande do Sul is relatively abundant and private companies such as the AUD Rice Irrigation Association are able to provide farmers with water on demand. Although the Brazilian government paid the large construction costs on the project upfront, enabling AUD to cover the relatively low maintenance to run the operation, it does provide an example where government and private industry can work together on a critical issue. In the U.S., agriculture in the west will remain highly dependent on water yet issues such as urban encroachment, irrigation efficiency (flood vs. drip) and crop selection (i.e., growing high water demand crops such as cotton in water-constrained regions) will continue to be the driving forces if farming and agribusiness can be sustained.

Chemicals. Chemicals, which include fertilizers, pesticides, and insecticides, are another major input driving increased productivity and improved risk management for the farmer. After World War II, the use of fertilizers grew substantially to over 50 million tons by the mid-1990s.

Improved seeds and irrigation made crops become more responsive to increased quantities of fertilizers.[xvii] Specifically, the use of nitrogen fertilizer increased substantially after 1960 primarily due to decreasing prices and costs.[xviii] Somewhat more controversial, the use of pesticides also increased 10-fold from 1945 to 1972.[xix] Analysis from the late 1960s showed that for every additional dollar spent on fertilizers or pesticides, it generated on average an increased agricultural output of $3 to $5.[xx] Analysis that is more recent indicates that for every $1 spent on pesticides, it yields only a little more than $1 of output. This correlates to the recent slow down of pesticide use. As Americans become more affluent and self-conscious, they demand safe products not only for themselves, but for the environment as well. This places more pressure on reducing chemical use as an input. In order to meet the growing demands for low-cost food, more farmers are turning to biotechnology and genetically altered animals, plants and feeds (*see Essay #2, Biotechnology*). The American farmer will become increasingly more reliant on technology that focuses on reducing risk and input costs, helping producers remain competitive in an increasingly global market.

"Not your Daddy's Agribusiness!"
-Steve Randolph

Farmers

A "farm" is defined as "a *place* of agricultural production, and associates with each such place an *operator* of the farm."[xxi] For most Americans, when you mention the word "farm" or "farmer," images of the American Gothic often come to mind. The small family farm and farmer is an indelible part of the American psyche: independent, hard working and resilient. Although this image remains an important part of farming, it certainly has evolved during the 20th century into big business. Similar to other parts of the value chain, farming has experienced many of the same trends with increasing productivity, consolidation and integration.

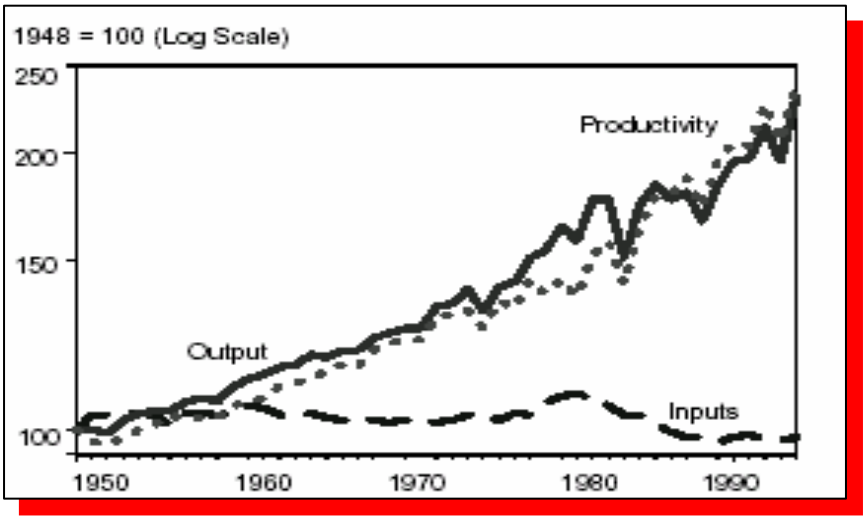


Figure 2

Productivity. Probably the most important graph in our study, Figure 2 shows that U.S. agribusiness has increased six-fold in productivity since 1940.[xxii] This increased productivity is primarily due to technology infusion and increasing access to information throughout the 20th century. Advances with machinery (i.e., all-purpose tractor), animal innovations (i.e., cross-breeding and disease control), plant innovations (i.e., hybrid and GMO corn and insect control), land-use improvements (i.e., crop rotations, precision farming and nitrogen fixation) and improvements in rural infrastructure (i.e., electrification, improved roads and radio/telephone access) all have greatly improved productivity on the American farm. Technology infusion continues today with advances in chemicals (i.e., herbicides, insecticides and fertilizers) and biotechnology (*See Essay #2*). However, improvements in productivity are mainly due to increased access and use of "information" on the farm. As late as 1950, only 38 percent of the farms had phones and 85 percent had electricity.[xxiii] It wasn't until the end of the century before nearly 100 percent of commercial farms had access to electricity, television and telephone service.[xxiv] Communication improvements give farmers access to crop and farm data, marketing data, and economic analysis and forecasting not available to them in the past.[xxv] Today, precision agriculture provides farmers access to data and information never dreamed of in the past. With satellite and aerial scanning, farmers now have information on soil content (i.e., chemical, water, etc.) and are able to apply the most efficient amounts of inputs to maximize productivity. The first information revolution came to rural America with the advent of the radio and telephone. Although today's farmer now has access to the internet, surprisingly, its overall impact remains small. While the internet may not be required, if American farm productivity is to continue to grow, information technologies (IT) must reach the farmer. Almost all emerging technologies rely on the management of massive amounts of information. IT will be required to assist. The connection between agricultural productivity increases and agricultural research can't be overemphasized. As early as the late 1930s, increased spending on research can be correlated with improvements in productivity.[xxvi]

This continued and rapid increase in farm productivity is certainly good news and portends well for the industry and the U.S. economy as a whole. For those farmers able to take advantage of technological innovations, the increased productivity has led to higher incomes and

an improved standard of living. Since 1940, real net income per farm has risen from $7,000 to $19,300 (1992 dollars).[xxvii] Improved productivity also bodes well for the consumer in terms of lower food costs. It also enhances the U.S. standing in the global market (*See Essay #3, Trade*). However, like most economic decisions with limited resources, tradeoffs must be made. Arguably, there are social and economic costs to farm workers and the traditional American farm as we continue to raise productivity.

Consolidation. Farming and agriculture have been a significant part of U.S. economic growth, especially during the first half of the 20th century. However, there have been several structural changes within this sector: a sharp decrease in the number of farms and, at the same time, an increase in the size of the average farm, increased consolidation and integration. In 1920, the number of farms was nearly 6.5 million with over 31 million residents on farms, accounting for 30 percent of the nation's population.[xxviii] The number of farms continued to rise to its peak in 1935, numbering nearly 7 million farms, but quickly began to fall in the late 1930s, down to a little over 2 million farms today.[xxix] By 1997, the number of U.S. farm residents had dwindled to barely 4 million, making up less than 2 percent of the total population.[xxx] While the number of farms has decreased, the average size of a farm has increased over 3 times to nearly 470 acres per farm by the late 1990's.[xxxi] The growth of large commercial farms has fundamentally altered the landscape of American agriculture. Agricultural conglomerates dominate the farm market with less than 3 percent of all U.S. farms yet they account for over 50 percent of the nation's agricultural sales.[xxxii] At the same time, "small farms" accounting for the 50 percent in numbers, only account for 2 percent of farm sales.[xxxiii] Furthermore, most of these "small" farmers are unable to sustain a livelihood solely on farming, they must also rely on second off-farm income to survive. This horizontal concentration has led to more efficiency, economies of scale, and a greater ability to benefit from technological innovations. In turn, the large commercial farmer focuses more time on managerial and coordination tasks instead on direct labor. The largest commercial farms are "big business," are generally more profitable, and less dependent on off-farm income for survival.

Vertical Integration. Another important structural trend within the farm sector is increased vertical integration. More food processors, manufacturers and wholesalers are growing their own raw food products or forming closer networks with farmers rather than purchasing them from directly from the farmer.[xxxiv] These non-farm contractors are making many of the decisions and providing many of the inputs traditionally made by the farmer.[xxxv] Although some may feel vertical integration is destroying the small family farm, contractors are mitigating some of the risk normally experienced by farmers. During our visit to the Salinas Valley, CA, we witnessed a highly complicated, delicate, yet mutually beneficial relationship between Duda Farms and Sysco Foods. While Sysco, as a wholesaler that markets and distributes produce, wasn't directly into farming, they demand only the highest quality from Duda Farms. Sysco is directly involved in Duda's operations in terms of product inspection, branding, and harvesting and packaging in the field. However, Sysco's expectations and involvement in Duda's operations made them more efficient and raised their product quality. Establishing and nurturing this bilateral collaborative relationship is a key benefit for both entities if they are to compete domestically and globally.

Processors and Manufacturers

Food processors and manufacturer links include firms that "manufacture or process foods and beverages for human consumption and other related products such as manufactured ice, chewing gum, vegetable and animal fats and oils, and prepared feeds for animals and fowls."[xxxvi] These firms essentially transform the raw farm products into highly processed, highly differentiated and highly convenient products we see at restaurants and on grocery shelves. This section of the industry accounts for one-sixth of the U.S. manufacturing sector's activity,[xxxvii] and like farming, has undergone significant changes and consolidations. While food shipments generated nearly $500 billion in 1999, overall profit growth fell.[xxxviii] Manufacturers continue to increase the value added to food products in mature domestic markets despite limited profit growth. By value added, we mean "the difference between most costs of production—such as labor, capital and materials—and value of shipments."[xxxix] Products with high input costs such as meats and dairy have relatively modest value added inputs, while products such as bakery goods and beverages with low input costs and high marketing expenses show a 50 to 60 percent value added increase.[xl] Like other sectors within the agribusiness, the processors and manufacturers are using technology to help reduce labor costs. Consolidation, foreign markets and cost controls are used extensively to increase market share and income.[xli]

Mergers and Consolidation. The food processing and manufacturing industries remain in a state of consolidation with nearly 200 total acquisitions in 2000.[xlii] One reason is basic market forces are at play as less efficient processing plants are forced to close or merge with others. Another reason is consolidation can quickly expand a company's product line, increase market share and lower risk; especially important in a highly mature domestic market.[xliii] Finally, as other sectors or links like the food retailers engage in vertical integration and compete directly in the manufacturing sector, processors and manufacturers often use concentration and consolidation as a means to better compete and maintain their market share.

Trade. The U.S. is the world's largest importer and exporter of processed food products, with exports over $30 billion and imports nearing $37 billion in 2000.[xliv] While the U.S. did experience a negative balance in total agricultural trade in 2000, meat products, grain mill products and fats/oils categories did experience a positive trade balance.[xlv] As the trade deficit widens, processing and manufacturing firms are expanding abroad and increasing direct foreign investment overseas, to nearly $34 billion in 1998, in order to better compete globally.[xlvi] With a competitive advantage in food processing, production, infrastructure and technology, U.S. agribusiness should be able to compete in an increasingly global market. (*See Essay #3, Trade*).

Cost Controls. While employment in the food-processing sector rose slightly in 2000 to nearly 1.7 million workers, the overall cost of inputs went down.[xlvii] As consumers demand more variety and higher quality at a low price, manufacturers continue to apply pressure on the farmers to lower their prices on their raw food products. As a result, manufacturers paid 12 percent less for foodstuffs and 4 percent less for packaging materials in 2000 as compared to 1997.[xlviii]

Wholesalers

The food wholesalers sector provides value added input by working with processors and manufacturers to transport and distribute food products to the various grocers, retailers and food service firms and establishments. Despite a shrinking customer base as grocery chains continue to integrate and consolidate, the food wholesaler continues to experience increased sales as this sector also integrates horizontally.[xlix] Unlike other agribusiness sectors, foreign companies are entering the U.S. food wholesalers segment by buying U.S. firms.[l] A more recent trend within

food wholesaling elaborated below reflects opposite strategies on the part of two large wholesalers: 1) more focused concentration on food distribution and 2) increased vertical integration into retailing and the growth of warehouse clubs.

Rapid Consolidation. Fleming, the second largest grocery wholesalers with over $15 billion in sales in 2001, is pursuing a strategy of increased concentration and focus on its core competency, food distribution.[li] Fleming began selling off its company-owned supermarket chains in 2002 to focus more on small, convenience stores such as Q-Stop.[lii] Sysco, the nation's largest food service distributor with nearly $23 billion in sales in 2001, and other food service distributors are also pursuing consolidation as a means to increase efficiency, lower operating costs and expand markets.[liii] While the number of acquisitions of food service wholesalers remained relatively steady at 24 in 2000 (slightly down from 28 in 1998), the number of grocery wholesaler acquisitions has dropped from 21 in 1998 to 9 in 2000 as the industry became more concentrated.[liv]

Vertical Integration. As one piece of the wholesaling sector pursues concentration, another part is pursuing a strategy of vertical integration by acquiring additional retail firms. Supervalu, the largest grocery wholesaler with nearly $21 billion in sales in 2001, is expanding its focus on retail operations and firms.[lv] Sysco is also pursuing a vertical integration strategy by moving into the specialty meat processing sector while Performance Food Group's (PFG), the third largest food service distributor, moved into fresh-cut produce by acquiring the largest independent processing company, Fresh Express.[lvi]

Warehouse Clubs. Although more closely aligned with the retail or supermarket segment, growth of warehouse clubs such as Costco and Sam's Club have made them a power to be reckoned with for the food wholesalers. In 2000, Costco and Sam's Club accounted for 93 percent of the warehouse club market, having combined sales of nearly $59 billion.[lvii] As we witnessed with Heinemann's Bakeries of Chicago, a large part of its strategy to move away from the local grocery chain market into a larger food distributor and national market is tied directly with its sales of brownies and other baked goods to Sam's Club.

Retailers (Eating In)/Food Service (Eating Out)

The nation's supermarkets and food retailers are probably the most familiar link within the value chain. For many American consumers, the food supply chain doesn't exist beyond their local grocer. As a mixed blessing, this reflects the power of agribusiness in the U.S., but results in a vast majority of Americans with no real understanding of the complexity of putting food on the shelves. In the past, consumers relied heavily on grocery stores and markets for their access to America's abundant food supply. Nearly 75 percent of the consumer's food dollar was spent with food retailers in 1960, but this number has dropped steadily to nearly 50 percent in 2001.[lviii](See Figure 3) Like many of the other segments within the food system, the food retailing industry is undergoing significant change. Supermarket sales growth slowed in recent years due to increased competition from new and different entrants such as Costco as well as the American public increasingly spending less time in the kitchen and eating out more at restaurants. In response, food retailers are using information technology and consolidation to improve efficiencies and reduce operating costs. Traditional retailers are also taking steps to control employment and reduce labor costs as a means to improve productivity within this sector.

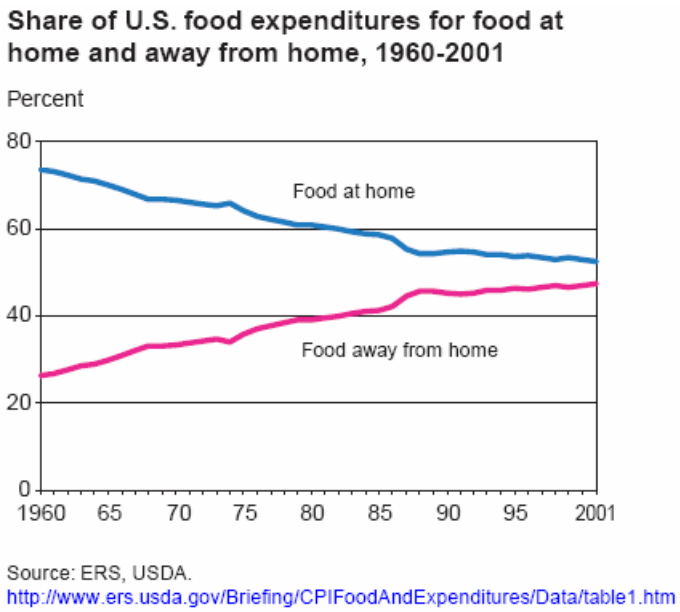


Figure 3

Sales and Growth. Overall foodstore sales in the U.S. rose to nearly $500 billion in 2000 with the traditional supermarket taking in approximately 75 percent or nearly $340 billion in sales. Adjusted for inflation, supermarket sales have been relatively flat as restaurants, food service and other retail formats grabbed an increasing share of the consumer's food dollar. Convenience stores had nearly $50 billion in sales, a 9.3 percent over sales in 1997.[lix] As the harried American public demands more convenience, the number of convenience stores grew to 55,000 in 1997 up from 54,000 stores in 1992.[lx] The remaining foodstore sales went to the small "mom and pop" grocers ($72.7 billion in 2000) and to the specialized foodstores such as bakeries, seafood markets and dairy stores ($25.4 billion in 2000).[lxi]

As mentioned earlier, not only are the traditional food retailers competing fiercely among themselves, they are now under assault from non-traditional food retailers such as warehouse clubs (Costco, Sam's Club) and other retailers such as drugstores, gasoline stations, etc. These non-traditional retailers accounted for nearly a quarter of the total food sales in 2000 ($105.2 billion).[lxii] The continued onslaught has forced the traditional retailer to improve efficiency through mergers, technology, format changes and productivity improvements.

Consolidation and Mergers. In response to the growing competition from non-traditional stores and restaurants, the traditional retailers are using acquisitions as a means to expand, to maintain and increase market share and to improve efficiency. During the period 1997 to 2000 over 4,100 supermarkets were bought out, representing a combined annual sales of nearly $70 billion.[lxiii] The industry's recent trend towards consolidation and concentration fueled fears of higher food prices as the number of competitors decreased within certain markets. However, most of the larger retailers used consolidation to move into other markets instead of taking over competitors within a market. Local antitrust enforcement and community concern have influenced the larger retailers from concentrating in certain markets. In turn, this has maintained competition in most markets.

Information Technology. Another avenue many traditional retailers are using to remain competitive is information technology. As Americans continue to demand more convenience, many supermarkets are introducing self-checkout lanes as well as wireless shopping devices that

can access a customer's preference accounts to help them with their shopping. With more Americans getting online, some retailers are turning to internet shopping and home delivery services. Although online shopping and home delivery generated interest among consumers, revenues and sales have been limited. It's expected that online sales will remain small as retailers work out numerous logistical bugs (e.g., high expectations for delivery times and preventing spoilage for produce and meats).[lxiv] Such advances in technology are most assuredly in response to rising labor costs. We may expect to see similar "labor-free" advances in the future.

Labor. Labor remains a major input cost for the traditional food retailer as they compete against discount grocers and warehouse clubs. Foodstore employment grew 1.2 percent in 2000 from 1997 to 3.5 million workers.[lxv] Many supermarket employees are represented by labor unions (i.e., United Food and Commercial Workers) garnering contract packages covering wages, benefits, rules and working conditions. Although these contracts appear to protect and promote a higher standard of living for the workers, we heard repeatedly from the firms we visited throughout the country how union rules and contracts stifled innovation, flexibility and the ability to compete. Many retailers see themselves forced into an adversarial relationship with the unions to reduce labor costs. In response, labor unions are fighting back with the recent strikes against the Safeway supermarkets in California to protect the remaining benefits for their members. Since it's often difficult for retailers to directly confront the labor unions, many food retailers have increased labor productivity through other means. Although our study didn't schedule any meetings/visits with food industry labor groups, such a visit by future seminars would provide another perspective of the labor situation. However, we did observe throughout the industry, retailers are using a strategy of vertical and horizontal acquisitions and eliminating excess overhead staffs. They are also introducing more prepackaged and self-service items, reducing the need for labor on the shop floor.

Food Service (Eating Out). In contrast to food retailers, the number of food service firms such as restaurants continues to expand with over 844,000 eating establishments in 2002 as Americans continue to spend more of their food money away from home.[lxvi] Total food service sales continues to rise, growing to over $400 billion in 2001 and is expected to gain nearly 50 percent of the consumer's food dollar by 2010.[lxvii] Fast food restaurants dominate the restaurant industry as Americans continue to demand more convenience and speed. McDonald's Corp led the pack with over $20 billion in sales in 2000.[lxviii] As fast food restaurants tend to focus more on taste (and fat) and less on nutrition, Americans are often caught between convenience and nutrition. As a result, American's eating habits (and girth) have changed for the worse. (*See Essay #4, Changing American Eating Habits).*

Consumers

Early in the 20th century, a farmer's main objective was to keep up with the demand for food from the growing U.S. population. Farmers generally pushed large amounts of commodities through the value chain that kept costs and prices down.[lxix] This system worked fine as long as the consumer wanted only the basic foodstuffs to cook in their own kitchens. However, as the U.S. market matured and the average American became more affluent, the consumer not only demanded food to meet their basic energy requirement, but also wanted a variety of nutritious foods.[lxx] The changing U.S. demographics (*older consumers, greater ethnic diversity, and larger incomes*) also continued to drive changes in consumer demands for

products. At the same time, the share of disposal income spent on food has dropped steadily over the last 50 years from nearly 23 percent in 1949 down to almost 10 percent today.[lxxi] Today's time-pressed consumer is using their greater disposal income to buy food products and services that offer convenience, quality, variety and value.[lxxii] Instead of a supply chain where the farmer pushes his product to the consumer, it's now a system where the consumer calls the shots, placing demands on the farmer. Fundamentally, a different consumer is forcing a different kind of farmer in rural America.

Mature Consumers. As the baby boomers enter retirement, the number of Americans over the age of 65 will increase to 54 million by 2020.[lxxiii] In turn, meeting the needs of older Americans will be an important marketing strategy for the entire food system. Older Americans are generally more health conscious and typically eat less due to lower activity levels than the younger Americans. As a result, American seniors are demanding different food products and services. As Americans age, their preferences change with less demand for fried potatoes, cheese, sugar, beef and chicken while wanting more eggs, fish, fruits and vegetables.[lxxiv]

Diverse Ethnic Population. While more Americans are growing older, the overall U.S. population will also become more diverse causing additional changes in food preferences. By 2020, the number of Hispanics is expected to grow to 18 percent of the population, up from 12.6 percent in the year 2000, while Asians are expected to grow from 3.9 percent to 5 percent.[lxxv] This growing ethnic diversity will not only shift food preferences, but also expand the variety of foodstuffs not typically found in the present American diet. While only a few years ago consumers would find American staples such as turkey and Salisbury steak in the frozen food section at their local grocer, now they find a wide variety of meals including Thai chicken and Mexican enchiladas. As Americans become more ethnically diverse, they're more likely to eat more fruit, nuts, eggs, and fish.[lxxvi] At the same time, Asians and Hispanics are demanding less dairy products and prefer rice to potatoes.[lxxvii] In contrast to aging Americans, ethnic populations are eating slightly more beef as well.[lxxviii]

Growing Affluence/Mature Market. As all Americans raise their standard of living and gain greater affluence, their demands on the entire food system grows. No longer are Americans looking to the food system to meet minimum energy requirements and basic needs. They're demanding greater variety, value and access. In this "mature" domestic market, most Americans are well fed and are demanding an upgrade in their food choices to include higher grades of meat, ready-to-eat meals and more expensive restaurants.

The Role(s) of Government

As a national and public policy, the U.S. believes trade liberalization and free open markets are the best means for lifting societies of poverty, hopelessness and despair, and improving the quality of life for individuals globally. Free market forces, when left to their devices, will allocate limited resources efficiently, albeit, ruthlessly. Since the question of "fairness" isn't an economic one per say, we've relied on government and policy makers to address the moral issues and correct the imbalances. From the creation of our nation, the U.S. government intervened and has played a major role in agribusiness. As an industry heavily subsidized and supported, there hasn't been a greater force in shaping agribusiness than government.

Traditional Breadth of U.S. Farm Policy

From the beginning of our nation's history, government and agribusiness have been tightly intertwined. However, the role of government and farm policy has evolved over time as the relationship between government and agribusiness has reflected changes in society, technology and the overall role of government in American lives. Looking at the first 200 years of U.S. history, U.S. farm policy, its strategy and goals, can be broken down into four overlapping periods: 1) expansion and settlements, 2) productivity improvement through education, 3) market regulation and infrastructure improvements, and 4) direct government intervention and farm support.

Land Distribution and Settlement Expansion (1785-1890). As a new nation with vast tracts of unsettled (at least by European descendents) lands as well as a limited national treasury, the U.S. focused on a policy of expansion and development.[lxxix] In order to first secure and later develop these large territories, the federal government encouraged its domestic population, and new immigrants, to move onto these lands. As a country with limited industrial capacity, the land was more suitable for agriculture and farming. At the same time, the new government was interested in filling its treasury and favored selling large tracks of lands at high prices. However, as sales of land slowed, more pressure was placed on transferring public lands to the small private farmer. Over the ensuing decades, land prices were continually reduced until 1862, with the passage of the Homestead Act. The Homestead Act provided free land to anyone who would farm it.[lxxx] Believing that widespread settlement would secure the nation's territory, increase economic growth and promote population growth with strong, independent families, this expansion and development policy continued until 1890 when most of the great western farmlands were finally claimed.[lxxxi]

Productivity Improvements (1830-1914). As independent farmers began cultivating the great frontier, government policy shifted to improving the productivity and quality of life for the farmer. With a growing number of large, fertile western lands, which could operate more cheaply, competing directly with the established, settled lands in the East and South, these older farming regions began to promote education and research as a means to compete.[lxxxii] After many years of neglect, some farmers believed that improved fertilizers and soil cultivation would lead to greater yields and efficiency.[lxxxiii] In turn, farmers and other leaders called upon the government to take a leadership role in promoting and supporting education and agricultural research. Simultaneously, the U.S. began to grow and industrialize, especially along the east coast. The nation's industrialization demanded an increasing number of workers to support the manufacturing plants; and the increased productivity and efficiency in America's agriculture sector was seen as a way to free labor from farming to move into the factories.[lxxxiv]

Market Regulation and Infrastructure Improvements (1870-1933). As the U.S. continued to develop economically across all sectors, most of the nation's wealth accumulated in the industrialized urban centers while the agricultural and rural areas remained relatively impoverished. During this period, farmers continually lost more economic and political power as huge surpluses of agricultural products led to falling prices and income, or droughts and natural disasters wiped out farmers financially. The American farmer shouldered most of the risk in agriculture while much of manufacturing benefited from government protection and high tariffs.[lxxxv] Farmers organized, forming the Populist Party in the 1890s, to demand help in the form of federal government regulation.[lxxxvi] The Populist ideas spread throughout the country leading to increased education and research as well as allowing farmers to build cooperatives to

increase their buying and marketing power.[lxxxvii] Government intervention also led to improved infrastructure of roads, allowing farmers greater access to markets.

Direct Intervention/Farm Income Supports (1924-present). During the first two decades of the 20th century, the urban populations continued to grow, increasing the demand for food. With the onset of WWI, the demands continued to increase allowing farmers' incomes to reach par with other sectors.[lxxxviii] During this period, the number of farms and farmers also peaked (32 million farmers and nearly 7 million farms.) However, soon after WWI ended and the European agricultural sector was able to regain its footing, the international demand for U.S. food products fell drastically, resulting in lower farm prices in the U.S.[lxxxix] In response, farm leaders demanded direct government intervention by supporting farm prices via controlled supplies as well as using exports to help with surpluses.[xc] Federal intervention was limited at first, but with the onset of the Depression and natural disasters such as the Dust Bowl, sweeping government price supports and subsidies finally took hold. Starting with the New Deal in 1933, the primary mechanism to fix falling farm prices was through reductions in supply.[xci] Other mechanisms included payments for reduced planting and government storage of surpluses that essentially continue today.[xcii]

Current Farm Policy

The recent passage of the 2002 Farm Bill revealed that the philosophy of government intervention into agribusiness remains intact. Despite all the changes in agriculture and agribusiness outlined above, government farm policy seems embedded in Depression era assumptions. As an example of questionable governmental intervention, the present day sugar program includes provisions creating a support price for sugar in terms of a loan rate, guaranteeing a minimum price for their commodity as well as an import quota system, and limiting supply of sugar domestically.[xciii] If the market price of sugar falls below the established minimum price, the government accepts sugar (versus dollars) as loan repayment, thus guaranteeing a minimum price for the producer. However, to enforce this price floor, the government also restricts the sugar supply by limiting both domestic production and foreign sugar imports. The limited sugar supply forces the price above free-market levels. In the name of "fairness," government intervention may protect the sugar industry, but it comes at a very high cost to the consumer in terms of increased prices and lost jobs. With increased productivity, reduction in the number of farmers, consolidation and vertical integration throughout agribusiness as well as increased globalization, policy makers need to rethink the current farm policy. As a nation that champions free markets and trade liberalization, our current farm policy seriously distorts the market and damages U.S. credibility and good will abroad. Fundamentally, the overall structure of farm policy has not yet adjusted to global trade patterns and is on a collision course with the World Trade Organization (WTO). Our national support of agribusiness is under attack in the WTO as seen in the recent decision against the U.S. on its cotton supports (*See Essay #3, Trade).* It remains to be seen how the U.S. government will reconcile its competing interests with agribusiness and other trade issues.

In contrast, the governments of Chile and Brazil are taking different approaches in response to the U.S. government's continued subsidies and support to agribusiness. Chile, as a small country of 15 million people, has adopted a strategy of a "global partner." Following the adage that if "you can't beat them, then join them," Chile understands it doesn't have the global leverage to make the market rules. Instead, they believe they can compete in any market as long

as the rules are open, transparent and minimize any trade distortion. Unlike the U.S., the Chilean government doesn't have the legacy or internal political debate surrounding subsidies and support to their farmers. Instead, Chile is taking an "open economy" approach that is dependent on exports and international trade. Interestingly, the role of government over policy and intervention is vastly different between the U.S. and Chile. The Chilean government takes a minimal role, acting more as a facilitator between industry and other governments with limited regulation and some promotional campaigns. Private industry, through associations and cooperatives, has the major role in promoting Chilean products around the world. At the same time, Chile is taking advantage of the opposite seasonal harvest periods from the northern hemisphere. U.S. consumers are no longer satisfied with fresh fruits and vegetables only in the summer, but demand them all year long. Chile is adapting to the dynamics of agribusiness and filling the void as seen with Chilean table grapes being available during the U.S. winter. By focusing on agricultural products such as fruits where they don't face direct competition generated by U.S. subsidies (e.g. wheat and corn), Chile is living and touting the virtues of free and open markets.

Brazil, on the other hand, is taking a more confrontational strategy to U.S. supports. Like Chile, Brazil has limited resources and simply cannot provide government supports to their farmers as the U.S does. However, unlike Chile, Brazil is quickly becoming a major competitor in agribusiness as their agricultural sector expands into vast, untapped lands. Brazil feels it has no choice but to attack U.S. policies when it comes to subsidies since they're competing directly with the U.S. in heavily subsidies such as soybeans, wheat and corn. Taking a leadership role with other developing nations (i.e., G-20. *See Essay #3, Trade*), Brazil is willing to take on the U.S. and European Union over market distorting support policies and appears to be winning with the recent decision in the WTO on cotton.

"If you want to make $1 million in farming, start with $2 million!"
-Anonymous

Future Outlook and Prospects

Despite the many challenges associated with globalization and sustaining productivity, agribusiness as a whole remains a healthy industry with a positive outlook. United States agribusiness remains the leader and envy in the world. Both in the short and long term, agribusiness is full of opportunities for all sectors of the value chain. As a farmer in Indiana stated, "We have a comparative advantage and we can compete on the global market if we're allowed." However, in order to compete, the U.S. must understand the dynamics and trends of the industry and turn any pitfalls into opportunities. The striking trend of strong productivity growth and declining food costs for all consumers seen throughout the 20th century should continue. With our distinct technological advantage in research & development and biotechnology, the U.S. can compete against those nations with relatively low labor costs such as China and Brazil. Our transportation infrastructure and networks remain one of the best in the world; however, as a nation we mustn't become complacent about our advantages, but should continue to strive for improvements in productivity and infrastructure on all fronts.

Globalization, probably in agribusiness more than any other sector, is a reality. The emergence of China and other competitors where labor costs are low is simply a fact of life. How the industry deals with this fact is one of the strategic questions it faces. As we heard numerous times in our travels throughout the U.S. and abroad, China is viewed with great trepidation and yet full of opportunities. China with its enormous labor force can essentially overwhelm any competitor in the farming sector. However, like all nations, China doesn't have unlimited resources, and must allocate their resources efficiently. At the same time, as the standard of living rises for the Chinese population, China is finding it increasingly difficult to provide for its own people. The key question for American agribusiness is whether it can adapt to the changes and capitalize in the new market arena. In areas such as fruit and vegetable production that are labor intensive, the Chinese have the competitive advantage. However, in commodities, value added packaging, processing and services, American technology and infrastructure should continue to reduce input costs while increasing productivity and thus help us maintain our comparative advantage in these areas.

Technology will remain a key competitive advantage for the U.S. Technological innovation continues as a major driving force in agribusiness by lowering input costs and improving productivity. Biotechnology, initially viewed with great promise, has dampened recently. This negative backlash, primarily in Europe, is more due to emotional and social politics and less on real facts. However, some of this concern related to genetically modified organisms (GMOs) has spilled over into the U.S. Despite some negative reactions, GMOs will continue to play a major role in our ability to sustain our productivity growth. Plant breeding and genetic variations will increase overall productivity by improving yields per acre, satisfying consumer demands, reducing input costs and allowing crops to be grown in areas not open to agriculture in the past. The potential health benefits are enormous with examples like "golden rice" fortified with vitamin A possibly eliminating many eye deficiencies. Not only will opportunities for agribusiness on the earth's surface increase, but Presidential calls to carry man to Mars opens a whole new frontier for agriculture. As we've seen at Purdue University, increased research and development funding for artificial closed eco-systems capable of sustaining man on the Moon and Mars creates challenges for the industry. The U.S. must decide if it wants to accept these challenges and turn them into opportunities.

Food safety and agro-terrorism presents a variety of challenges for the industry. Food safety has always been a concern for the industry, but has become even more prominent with increased use of global networks and transportation modes. The events of 9/11 have dramatically changed how Americans view food security. With so many points of entry and potential targets for terrorists, the key issue facing the industry is how to balance security and risk against costs. As mentioned earlier, many farms and firms have very small margins, and if they're forced to absorb the increased security costs, many will simply fold. Consumers continue to demand safe, reliable food products, yet are unwilling to pay high costs for food. If the farmers and firms are unable to pay, and the consumers unwilling to pay, the question arises who's going to pay for the added costs for security?

Conclusions/Recommendations

Agribusiness remains a vital part of our national economy and is healthy, productive and vibrant from both an economic and national security perspective. The fundamental responsibility of the U.S. government to feed and sustain its people and armies remains secure.

From an economic perspective, all sectors of the industry can compete in the global markets. As we studied this critical industry over the previous five months, we came to several, top-level conclusions. We also offer some insight and recommendations on how and where agribusiness must proceed both from economic and national security perspectives.

Technology Remains Our Competitive Advantage. As we heard repeatedly, technology infusion throughout the 20th century was the driving force that led the U.S. to its leadership role in agribusiness. As the U.S. competes against emerging economies in the 21st century, technology remains our competitive advantage for this industry. The U.S. can only compete against nations with relatively low labor costs if it can continue to leverage technology to lower and minimize labor costs. In sectors where the U.S. continue to take advantage of labor reducing technologies such as wheat and corn, the U.S. cannot only compete, but can dominate the market. In areas where labor saving technologies aren't available or where its cost prohibitive, the U.S. should leave these sectors to market forces (e.g. sugar). However, the U.S. can't rest on its current advantages in technology. The U.S. must increase both public and private agricultural R&D if it is to maintain this competitive advantage. Continued investment in technology promises to be the equalizer with the greater market forces. With limited resources at all levels of government, consideration should be given to transferring agricultural subsidy funding to R&D.

Adapting the Government-Industry Relationship. As a nation that continues to tout the virtues of capitalism and free markets, we must reform the role of government in agribusiness. Impartial observers generally agree that subsidies greatly distort free market forces, often to the detriment of American consumers. The U.S. government and policy makers must undertake a strategic review of its subsidy policy and decide which aspects of the industry are critical to national security and which sectors need to be cut lose to compete freely. The current approach will be stripped away by WTO action, so change is essential. The question remains how to shape change to secure the industry and ensure its competitive advantage in a rapidly changing world environment. However, one must be pragmatic when dealing with our wonderful democratic system driven much by politics. One approach is to revisit at a *strategic level* how the U.S. currently allocates its $20 billion of subsidies. Instead of a piece-meal, almost district-by-district distribution of critical resources, maybe it's possible to redistribute resources and address some of the concerns and challenges that face the industry today. Another approach is to use the money freed up by the subsidies being phased out in accordance with WTO requirements. These reinvestments would come in the areas of R&D, food security, and perhaps some means of addressing the urban encroachment issues. These ideas are only a few ways to better allocate scarce resources. The U.S. must reconcile the competing interests within agribusiness (e.g., labor rights, rural way of life, food supply critical to national security, efficient use of limited water resources, etc.) The U.S. must toss out the outdated Depression era assumptions, and redefine its role in the industry by focusing more strategically on education, technology, exports and other areas where it can compete. The political difficulties are evident to everyone, but the status quo is unsustainable and it is the responsibility of leaders in the government and industry to move in the right direction for its long-term health.

Continue to Engage Multilaterally. The U.S. must continue to engage multilaterally through the World Trade Organization (WTO), and keep its commitments to reduce subsidies and tariffs for all products, specifically on agribusiness products. The U.S. has demanded free market reforms of other nations, often at great expense to their economies, and for the most part, they have complied. Now the U.S. must meet its commitments and re-establish its role as the moral

leader for free markets as the best means to raise peoples out of poverty. Again, the U.S. should eliminate most, if not all, its subsidies. For most products, the U.S. can compete in a global market without subsidies.

Strategic Plan for Agribusiness. Probably the biggest shortfall we saw in the industry was a lack of a strategic plan for agribusiness. We're told that USDA develops a strategic plan for agriculture and agribusiness, but its not widely known outside of the department. Too many important decisions relating to the industry are made at the local level, in isolation or based only on political factors. While strategic plans are often viewed as "central planning" in the Soviet sense or apply only to national security matters, they can provide an overarching direction or set of priorities for an industry. The USDA is probably the best agency to develop a strategic plan, but it should be heavily coordinated with other stakeholders such as EPA, Department of Commerce, United States Trade Representative (USTR), Department of Homeland Security, etc. DoD should also weigh in on areas relating to national security. This plan shouldn't choose the winners and losers. Instead, it should provide a national level set of priorities that helps allocate critical resources much in the same manner the National Security Strategy (NSS) does for the military and the defense industry. The plan must address the critical issues outlined in this paper such as agro-terrorism, trade, urban growth and the government-industry relationship. As a good example, Chile decided over a decade ago that it couldn't compete with the U.S. and other developed countries with its own subsidies and tariffs. Instead, Chile decided at a strategic level to drop all of its subsidies and tariffs and truly compete as a free market country. Chile decided to focus on exports and today the country is a true success story. Although Chile is a small country and was able to find a niche with fruit, it took a strategic view of its industry. With over 75 percent of its crops grown for export, the standard of living for its people has risen substantially. A strategic level plan for U.S. agribusiness should help the industry address its many challenges and take advantage of the many opportunities it faces in the 21st century.

Essay #1: Agro terrorism/Food Safety

INTRODUCTION

American agribusiness continues to be a mainstay of the economic foundation of the United States. The agribusiness industry, including growers, processors, distributors, retail grocers, and restaurant owners is undergoing tremendous change as the food value chain is redefined in the midst of changing consumer demands and a dynamic global market of producers and consumers. While farmers and firms in the agricultural sector face the formidable challenge of trying to remain competitive and profitable while ensuring food safety, another threat emerges in the form of sector vulnerability to potential deliberate attacks on the U.S. agricultural base by terrorists.

FOOD SAFETY

Food safety is very interrelated with two other overlapping areas of food supply protection - food quality and food security. *Food safety* focuses on the safe handling of agricultural commodities from harvest or slaughter, through processing, packaging and preparation to consumption, and traditionally involves procedures to prevent contamination of

food with dangerous organisms or pathogens capable of causing illness or worse to consumers of food products. *Food quality* refers to the texture, appearance, freshness, taste, and overall desirability of food products delivered to the consumer. *Food security* is used somewhat interchangeably with food safety except it more often refers to those measures taken to protect the food supply from accidental or deliberate adulteration which could lead to severe health consequences to the public or large scale financial damage to the agribusiness sector. More than two hundred known diseases are spread through food. A prominent doctor reports, "each year, food borne diseases cause 5,000 deaths, hospitalize 325,000 people, and cause 76 million illnesses." (Frist 139)

The United States Department of Agriculture Food Safety and Inspection Service (FSIS) plays a key role as the primary governmental entity involved in assisting members of the food service and processing business in the safe handling of food items. They both educate and inspect within the industry for regulatory compliance. Sound programs for safe food handling are paramount to maintaining the industry's standards and the food chain sanctity. The National Restaurant Association found that cleanliness of restaurants is the #1 customer concern, and the average cost of a food borne illness outbreak to an establishment is about $75,000. In addition, as many as 40 percent of all food borne illnesses result from poor hygiene with 50 percent of food borne illnesses caused by time-temperature abuse of food products. (San Jamar 8-11) These figures are significant not only in terms of lost revenue, but also perhaps more importantly, the potential costs of litigation against the food service providers and non-recoverable damage to a facility's reputation and lost future revenues.

The Food and Drug Administration (FDA) recognized the need to step up inspections of imported food products to better screen incoming food materials for contaminants at the ports of entry by including a budget increase proposal in its FY 2005 budget submission. The increase is part of the FDA's $181 M counter-terrorism budget. A substantial $7 M is earmarked for increased FDA inspections of domestic and imported food to reduce the risk of contaminated products entering the United States market. In FY 2005, FDA is expected to conduct 97,000 import field inspections, a more than 60 percent increase over last year, and seven times the number of such inspections in FY 2001. FDA also intends to conduct nearly 26,000 examinations of domestic food firms, almost eleven times the number of exams in FY 2001. (M2 Communications 1) Increasing inspections and interagency cooperation will begin to improve the overall food safety network of players, governmental and private sector industry. Ensuring food safety is a daunting task. This includes everything from proper hand washing procedures in a restaurant's employee lavatory to comprehensive inspections of imported agricultural commodities from foreign countries at our ports prior to the imports being further transported and mixed into intermediate food products in the processing chain. Food Safety efforts will continue to also look at ways to mitigate the risks of the further introduction or spread of animal diseases such as bovine spongiform encephalopathy (B.S.E. - commonly referred to as "Mad Cow" disease) or the poultry disease of avian influenza (bird flu) which have had devastating effects on the agricultural economy worldwide and in the U.S.

AGROTERRORISM

On February 3, 2004, President Bush released an executive order directing three Cabinet departments and the Environmental Protection Agency (EPA) to develop new procedures to protect the nation's food supply from terror attack. This involves the Department of Agriculture, Department of Health and Human Services, Department of Homeland Security, and the EPA. (Dreyfuss 1) The U.S. must not overlook or ignore the threat of agro terrorism and/or

bioterrorism in the overall strategy of defending the U.S. homeland. There are five main potential targets of agricultural bioterrorism. These include "field crops; farm animals; food items in the processing or distribution chain; market-ready foods at the wholesale or retail level; and agricultural facilities, including processing plants, storage facilities, wholesale and retail food outlets, elements of the transportation infrastructure, and research laboratories." (Parker 12)

Departments and agencies previously involved in conventional food safety (non-intentional contaminant intrusion into the food system) suddenly find themselves a part of increased national security measure activity. Disturbingly, the agricultural sector offers a host of vulnerabilities due to the number of participants in the food chain and distribution system, the combination of plant and animal systems, and the various vectors through which harmful substances or organisms can be introduced. Further adding to the vulnerability is a general lack of non-interrupted traceability of food products and ingredient lineages through multiple food processing steps from the origination point (field or live animal birthing/hatching location) to the ultimate point of consumption. Shortcomings in detailed record keeping on disease reporting and insufficient food security and internal quality controls also compound the vulnerability problem and the problem of developing and enacting seamless counter terrorism strategies. (Food Security 16)

Senator Bill Frist, the only doctor serving in the United States Senate, expressed concern about the vulnerability of our nation's food supply to a potential biological attack, primarily due to inadequate governmental oversight. He states, "The Food and Drug Administration presently has fewer than 800 food inspectors to oversee food imports at more than 300 ports of entry and to inspect 57,000 sites across the country. It's an impossible task for so few inspectors…this leaves our food supply highly vulnerable to the determined terrorist." (Frist 138) The FDA also only inspects about 1 percent of all agricultural imports (although they are receiving increased funding and hope to raise that level to 5 percent). A terrorist could seek to contaminate food consumed by the population (food borne diseases like botulism, brucellosis, listeriosis, and Vibrio vulnificus) or by carrying out an agro terrorist attack through animals by cultivating the foot-and-mouth-disease virus and exposing a domestic herd. As we have recently seen with the results of just one disease case of B.S.E., the consequences could be economically disastrous.

ACTIONS TAKEN & CURRENT INITIATIVES

Congress passed the landmark Public Health Security and Bioterrorism Preparedness and Response Act of 2002. That Act directed the Department of Health and Human Services (DHHS), FDA's parent organization, to take aggressive steps to protect the public health from deliberate or accidental contamination of our food supply. In July of 2003, HHS Secretary Tommy Thompson announced $5 M in funding to support a new research program to develop technologies and strategies to prevent and minimize potential threats to the safety and security of the nation's food supply. The main recipient of this funding is the FDA, with an emphasis on new prevention and mitigation technologies and contamination assessment capabilities. The FDA is emphasizing effective government and industry partnerships and public communication as a key part of their food safety and security framework. (Acheson)

The FDA's food safety and security framework is built on a core of sound science, surrounded by a circle of Good Manufacturing Practices, Hazard Analysis Critical Control Points, and Surveillance Programs. (Acheson) Increases in FDA staff, more focus on imports with an "Import Strategic Plan", and a memorandum of understanding with the Customs and Border Patrol (CBP) commissioning Customs Officers to conduct inspections on FDA's behalf are significant changes in procedures from the past. To respond to incidents in a crisis, the FDA

established its Office of Crisis Management for emergency response, and is working to increase laboratory capacity in general and surge capacity as well. Of particular significance is the interoperability between the FDA, state and federal laboratory network, CDC, USDA-FSIS, EPA, and the Department of Energy (DOE) in the Food Emergency Response Network (FERN). This network has grown significantly in the years since September 11, 2001, and connects the national laboratory system to assist with chemical, biological, and radiological agent identification and analysis. Following the passage of the Bioterrorism Act, signed into law on June 12, 2002, the FDA drafted Interim Final Rules (IFR) to implement the portions of the Act related to food safety. These IFR's require the registration of food facilities and prior notice of imported food shipments. Both measures aim for better mapping of the food facility infrastructure and greater inspection lead-time for food import arrivals. Registrations to date are running well behind the FDA's forecast, and this delinquency on the part of food facilities across the nation is causing concern at the FDA.

CONCLUSION/RECOMMENDATIONS

The nation has slowly come to grips with the vulnerability of its agricultural sector to a host of safety and security threats, some natural or accidental, and most recently, the possibility of deliberate attacks of agro terrorism. To continue and speed further progress, we recommend: 1) positive and productive cooperation between the government and the commercial/private agribusiness firms; 2) continued employment of information technology to improve traceability and collect/warehouse food network and disease outbreak data; and 3) re-allocating portions of current farm subsidies to pay for new regulatory compliance costs in the agribusiness sector and partially offset the negative economic impact to U.S. agribusiness global competitiveness during the transition to an improved national food safety and agro terrorism prevention structure.

Essay #2: Biotechnology

BACKGROUND

The Quadrennial Defense Review of 2001 challenges us to access key markets and strategic resources as part of our enduring national interests (DoD, 2001). America can answer this challenge by actively pursuing and resourcing an agricultural biotechnology program that exploits the burgeoning technological breakthroughs plant and animal genetic modification (GM) are making.

Biotechnology "is the application of scientific knowledge to transfer beneficial genetic traits from one species to another to enhance or protect an organism" (Dupont, 2004). The ability to insert non-native genes allows plants and animals to produce entirely new materials for innovative applications. Through biotechnology scientists can produce generations of plants and animals in the time of just one traditional breeding season (Stanley, 1991, p. 44).

Four countries – the U.S., Argentina, Canada, and China – accounted for 99 percent of the global biotech acreage in 2002. However, the adoption of biotech crops has actually been faster in developing countries than in developed countries (James, 2002, p. iii). In 2003, the world's arable land planted with GM crops amounted to more than 148 million acres. Although this represents only about 5 percent of world farm acreage, it did show a 12 percent increase from 2002 (Economist, 3/27/2003). Farmers are adopting this technology so quickly for some very simple reasons: GM crops improve yields, cut costs, reduce spraying, and save time.

Although recent media attention has focused heavily on European resistance to, and fears of, GM foods, the U.S. Department of Agriculture's (USDA) Animal and Plant Health

Inspection Services has been regulating biotechnology since 1987. They have overseen field-testing of more than 10,000 genetically engineered organisms. Over 60 gene-altered products have been deemed safe and deregulated for possible commercial use (Economist, 7/24/2003).

ANALYSIS OF VIABLE POLICY OPTIONS (PROS AND CONS)

Continued Research on Genetically Modified (GM) Foods and GM-Related Regulations

The most common depiction of agricultural biotechnology and GM is usually negative. Before concurring with this depiction consider the predictions for world hunger: with world population projected to top 8 billion by 2030, there will be another 2 billion people to feed, most of them in the undeveloped world. But annual increases in agricultural yields in recent years are holding at just 1.3percent a year – less than half of the gains of 30 years ago (Council for Biotechnology Information, 2003, p. 8). Much of the resistance to GM food stems from concern over its potential risks to human health and the environment. However, GM foods are already heavily scrutinized for nutritional content, toxicity, allergenicity, and genetic stability before being allowed on the market (Economist, 7/24/2003). But to take advantage of this technology requires dedicated research dollars – most of which is funded by the private sector. The firms in the GM business are not as robust as they once were. Many companies that have pioneered breakthroughs in GM crops (such as Monsanto and Syngenta) were part of profitable pharmaceutical companies. They are now independent operations and no longer have the same sources of funding for GM research or for purchasing seed companies. Seeds are the bridge between biotech labs and the nation's farmers, the delivery mechanism for the genes that scientists develop. Even with the resistance and fears of GM foods, farmers generally see cost advantages from GM crops, or they would not keep planting them. And the more that farmers buy these GM seeds, the more these giant chemical companies can continue their research to capture continuous gains in agricultural biotechnology.

One way to at least help address some of the fears associated with GM foods is through the creation of regulations that the public trusts and the delivery of benefits that the consumer can see and taste. The early marketing focus for GM crops were targeted to farmers – mostly because the early products did more for farmers; i.e.,, higher crops yields and resistance to pests. As a result, consumers were left totally on their own, only hearing about GM products from people warning of its dangers.

USDA will begin revising its rules governing GM crops, a process that will include for the first time a comprehensive review of the regulations' effect on the environment. "One of the best ways to help people feel more comfortable with the newer technology is knowing that there's a strong, robust regulatory structure in place" (Witte, 2004).

Viable U.S. Energy Program

The energy challenges our nation faces today offer tremendous opportunities for agriculture to help us solve our energy problems through the production of domestic liquid fuels, such as ethanol and biodiesel, and the emerging biodegradable plastics market. Renewable energy is good for freeing the U.S. from oil dependency, good for farmers, and good for the environment. The U.S. imports over 50 percent of its oil. Yet known global reserves of oil is expected to run dry in approximately 80 years, natural gas in 70 years and coal in 700 years – but the economic impact of their depletion could hit much sooner (Verma, 2000). This should encourage industry to explore manufacturing processes that substitute renewable resources, such as plants, for

petroleum. Biofuels could provide the U.S. military a measure of independence from extended fuel supply lines. The benefits of alternative fuels are simpler methods of processing and availability wherever there is vegetation. Small grains, grasses, even agricultural residues can be converted to ethanol via fermentation, and oil seeds can be extracted to obtain lubricant oil (BAST, 2001, p.57). However, production of biofuels is still very expensive when compared to current petroleum-based methods and the fact that the oil industry is heavily subsidized. Oil subsidies in the U.S. are in the range of $20 to $55 billion per year (Forestry Newsgroups, 2000). Eliminating these subsidies increases the retail cost of fuel oil and gasoline by approximately $1.50 per gallon. With such prices, alternative fuels become very competitive. "Would you rather buy a product made from corn from the Midwest or petroleum from the Middle East?" says Cargill Dow's chief technology officer (Chea, 2002).

The concept of agricultural-based plastics (or industrial biotechnology) is not a new idea, but has only recently become cost effective. For instance, a 50-50 joint venture between Cargill and Dow Chemical has developed a completely bio-based polymer (PLA) called "NatureWorks". Fermenting corn and sugar beet-derived starch produce the PLA polymer. One example of this product is the clear cold-drink cups made entirely from NatureWorks. Its physical properties are competitive with petroleum-based plastics – but the cups are also compostable (Boswell, 2001, p. FR15). Producers of this product estimate that the ability to fully compost food scraps without having to separate disposable utensils, packaging, etc., will save up to 35percent when compared with landfill options.

Agricultural Biotechnology for Military Applications

The U.S. Army has shown keen interest in the myriad of technological breakthroughs that agricultural biotechnology has to offer. Trends and developments in biotechnology could help increase the "tooth-to-tail" ratio (i.e.,, increasing combat effectiveness and reducing logistics support requirements). A major aspect of logistics is providing adequate quantities of fuel, ammunition, food, water, and other consumables to support an operation. A high proportion of the Army's future energy needs may be satisfied by renewable resources; i.e.,, biodiesel or other biofuels. The Army is working closely with the National Research Council and Purdue University to address major logistical challenges that today's modern army must face. GM foods could play a major role in reshaping how the U.S. Army feeds its troops. For example, other than what usually comes to mind (i.e.,, smaller, lighter, more nutritious food), a soldier's food could contain edible compounds, called biomarkers, used to help identify, track, or trace U.S. soldiers in combat or in peacekeeping actions (Purdue News, 2001). Another example is a project for DoD to develop GM plants and bacteria that can detect chemicals leached from explosives in the ground. These "sentinel bacteria" could be sprayed on suspected military sites. If contamination were present, the bacteria would change color (Gurley, 2003).

RECOMMENDATION AND RATIONALE

All the proposals discussed – an agricultural biotechnology-based energy program, continued GM research, and research/application of agricultural biotech for future military applications – can provide tremendous benefits. If the U.S. wishes to wean itself from the clutches of petroleum-based products, the technology is there to guide us in this direction. Many of these technologies will not be available immediately, however. In fact, it could take years to develop and perfect them. But it is crucial for the U.S. to begin forging new and effective partnerships with these emerging biotechnology industries if we wish to maintain our stature as a world leader on the forefront of technology. The genetic manipulation of plants and animals

remains controversial, even though countless studies and research have determined that usage of such products as safe. However, industrial biotechnology does not draw as much attention or controversy and posits some of the greatest alternatives for petroleum-based products and fuels, many of which are currently cost-competitive or close to it. This is a prime area on which the U.S. needs to push forward. But to gain the confidence and trust of our nation's stakeholders – consumers, farmers, the military, etc. – we must maintain the highest standards of ethics at all times, documented by clear guiding principles and transparent industry behavior. Trust and credibility are only built if safety is foremost on our minds, and questions regarding scientific uncertainties receive credible answers. This area requires the utmost attention of our nation's leaders. Solidarity and performance by all industry peers, value chain members, and governmental policy makers is what will make or break this effort if we intend to leverage agricultural biotechnology as a vital component of our nation's national security strategy.

Essay #3: Trade

INTRODUCTION

As we enter the 21st century, overseas markets will be the primary driver behind growth in the U.S. agricultural sector. U.S. agricultural exports will increase from approximately $60B in 2004 to nearly $90B by 2014. U.S. agricultural export values relative to total market cash receipts will increase from 25 percent to over 30 percent. Economic gains and population growth in developing countries will generate most of the increase. Agricultural imports should rise as well by about the same amount as exports, resulting in a relatively stable agricultural trade surplus in favor of the U.S. by $10B to $12B.[xciv] Continued economic growth in developing countries is important for U.S. exports because many developing countries are beginning to obtain income levels whereby their consumers diversify their diets with more U.S. exported meat and other high valued food products. Hence, the global economy is on the verge of explosive economic growth and the U.S. must posture its agricultural industry in order to take advantage of this expected growth while preparing the international market for fair and open trade.

DISCUSSION

As noted, agribusiness provides a significant input to U.S. trade. While the U.S. maintains an overall trade deficit, trade in agricultural products is a surplus as exports outstrip imports. With increasing productivity and the slowdown in domestic demand, the U.S. has become the world's largest agricultural exporter accounting for nearly 20 percent of all agricultural trade worldwide. Many U.S. commodities depend on export markets for their profitability. For example, 65 percent of U.S. almonds, 63 percent of U.S. sunflower seed oil and 57 percent of cattle hides go to overseas markets. One out of three acres planted in the U.S. supports products for export.[xcv]

For the most part, markets in developed countries such as the EU and Japan have become saturated. As a result, the most promising markets for U.S. agricultural exports are in developing countries, which now account for over 75 percent of total global food consumption. Their population growth accompanied by rising incomes and increasing demand for food beyond staple crops make these countries key targets for U.S. producers. Consumers in these countries are switching from cereals and grains to include more meats, fruits and vegetables in their diets.[xcvi] While market opportunities will abound in developing countries, many of these countries loom as major competitors for the U.S.

Brazil, one of the countries that we visited during our international travel, is among the most productive countries in the world, supplying 85% of the world market for orange juice concentrate. Brazil is a strong competitor and is likely to remain so, currently competing with the U.S. in world markets for beef, soybean and cotton in addition to citrus. The country is the second largest producer of soybeans and products, and the third largest producer of tobacco and poultry. In the 1990's, Brazil was one of the few countries in the world to increase the amount of land devoted to agriculture. During this period, the agricultural base grew from 240 million hectares to 250 million. As a result of this and other agricultural reforms, Brazil's agricultural production increased by 37 percent during this decade.[xcvii] In addition to increasing its land base, Brazil is capitalizing on technology to increase production and productivity. Already the number two producer of soybeans, Brazil last September lifted its ban on the planting or sale of genetically altered crops or foods, legalizing action it was unable to stop. Almost 30 percent of Brazil's soybeans grow from genetically modified seeds smuggled from Argentina.[xcviii] Even under the ban, Brazil produced more than 25 percent of the world's soybean crop. Last year's harvest of 52 million tons was 60 percent higher than five years earlier.[xcix] With this trend, Brazil hopes to overtake the U.S to become the world's top soybean producer.

Additionally, Brazil has undertaken trade reforms to increase its international competitiveness. In 1989, Brazil eliminated quantitative controls on agricultural exports and almost all non-tariff barriers. In 1990, Brazil unilaterally reduced its average tariff from 32 percent to 14 percent over three years. Following the change, agricultural tariffs fell, for example, to zero percent for cotton and edible beans. In addition to crop products, Brazil reduced tariffs on all livestock products. Tariffs on beef, poultry, pork and sheep meat were reduced from 15 to 10 percent, milk powder as well as butter and cheese tariffs were reduced from 25 to 20 percent.[c]

Chile, the other country we visited during our international travel, is another global agricultural giant, and its economic performance has been remarkable. Some recent economists analyzing the "Chilean miracle" attribute Chile's success to active government intervention rather than simply following free market policies. For example, the Chilean government, not the private sector, developed commercial salmon-farming technology, leading to today's booming exports. Government leaders specifically pursued a policy of export orientation to drive the Chilean economy. In the 1970's, Chilean leaders opened the heavily protected economy to international competition. The government has continued this policy focus by actively negotiating free trade arrangements with the U.S., Canada, Mexico, Central America, the EU and South Korea. Government leaders are now eyeing free trade talks with New Zealand. In the 1960's, Chile was a small exporter of apples, but is now one of the largest fruit exporters. In addition to apples, Chilean grapes, avocadoes, and kiwis are renowned throughout the world. Following rapid expansion in the 1980's, fruit and vegetable exports have stabilized at between $1.4 billion and $1.6 billion annually since 1995.

Despite steps countries have taken to increase their international competitiveness, agricultural trade is anything but free and open. In 2001, bowing to pressures from developing countries, members of the World Trade Organization (WTO) met in Doha, Qatar, and agreed to negotiate the liberalization of agricultural trade. The use of subsidies is one of the most contentious issues in agriculture. Developed countries rely largely on subsidies to provide stability for farmers, but subsidies can lower world prices, hurting farmers in developing countries. Subsidies distort trade by permitting farmers to export their products at prices below the cost of growing them. Altogether, the U.S. provides its farmers nearly $30 billion in trade

distorting subsidies, while the EU provides even greater amounts totaling $45 billion. Powerful farm lobbies in these countries wield enormous influence over government decisions regarding subsidies.

Developing countries have responded in several ways to what they see as unfair subsidies. First, many impose high tariffs to protect their farm sector (discussed below). Second, they have banded together to leverage their influence in international negotiations. The September 2003 WTO meeting in Cancun ended in disappointment because developing countries stood firm against negotiating with the industrialized countries, absent further movement on subsidies. Third, Brazil successfully launched a challenge in the World Trade Organization to U.S. cotton subsidies. In its draft report, the WTO ruled these subsidies illegal. The WTO ruling is not a good harbinger for the fate of U.S. subsidies for other crops, such as soybeans and wheat, but it may encourage the resumption of WTO negotiations.

Tariff levels are a contentious issue as well. While tariffs on industrial goods have dropped significantly, they have moved slowly on agricultural goods. Internationally, the average tariff for farm products is 62 percent, compared to only four percent for other goods. In talks to conclude the Free Trade Area of the Americas, Brazil is championing the reduction of U.S. tariffs on citrus, but the U.S. has been unable to offer concessions because of pressure from U.S. citrus growers.

Ultimately, the world economy suffers from these trade-distorting policies. "The World Bank estimates that an end to farm subsidies and tariffs could expand global wealth by as much as a half-trillion dollars and lift 150 million people out of poverty by 2015."[ci] The U.S. economy would gain extensively as well from an increase in global wealth as free market forces drive demand for U.S. products and services. Given this scenario, the United States Department of Agriculture's Economic Research Service estimates the yearly amount of U.S. agricultural exports would increase by 20 percent and U.S. consumer purchasing power would increase by over $13B annually.[cii]

RECOMMENDATION

Revitalizing stalled WTO talks is critical to liberalizing agricultural trade and expanding the U.S. agricultural sector. We recommend that the U.S. pursue a phased-approach multilateral agreement with all countries to reduce and eliminate trade-distorting subsidies and tariffs within the WTO framework. Only the U.S. has the influence to press other developed countries (especially in the E.U.) to follow its lead. The U.S.'s current two-pronged approach of negotiating bilateral and regional agreements while attempting to negotiate a comprehensive multilateral approach appears to be a convincing strategy. However, current negotiations to increase bilateral and regional agreements are occurring at the expense of WTO multilateral talks. Unfortunately, bilateral and regional agreements do not address the root problem of subsidies. Hence, the U.S. should prioritize a WTO multilateral agreement.

As we enter into a new century where globalization and interdependency drive everyday market decisions, it is imperative that the U.S., in concert with other nations, acts appropriately to abandon protectionist and unfair trade practices. These efforts can help stabilize income for farmers in developing countries and expand the overall world economy thereby increasing U.S. exports. The U.S. does not need subsidies to ensure its competitive advantage; it is already the world's most productive producer, aided by advanced technology and a superb infrastructure.

Essay #4: Changing American Eating Habits

A 1994 survey showed that one in four Americans was overweight.[ciii] Ten years later, the United States' overweight and obesity rates are even more alarming; two-thirds of adults are overweight and half of those are obese.[civ] At the root of the problem, Americans are consuming more than they're burning; people are eating larger meals, eating more often, and eating away from the home more now than ever. This will examine these trends, as well as those of children, and will discuss some of the consequences. It will also highlight some of the political and marketplace inertia resisting change to these trends.

Americans have gone from the "three squares a day" to more; eating is now a continuous event itself. Since 1987, the number of snacks per day has almost doubled, and in 1995, the United States Department of Agriculture (USDA) Center for Nutrition Policy and Promotion reported that snacks account for 34 percent of daily caloric intake.[cv]

Another trend in the American diet is that people are eating larger meals. Mark Dolliver's ADWEEK article, "Here's More Red Meat for Critics of the Way Americans Chow Down," referring to the USDA's Agriculture Fact Book, said, "meat consumption (including red meat, poultry, and fish) was 57 pounds higher per head in 2000 than in the 1950s."[cvi] Although during this timeframe red meat consumption had dropped, the Atkins diet is now driving an upturn.[cvii]

Whether it's choice beef or a quick meal, much like the consumers, portions are increasing in size. Leading this trend are America's fast food outlets, whose portions are now often two to five times larger than their original size.[cviii] McDonald's is a typical offender; a McDonald's meal of yesterday, consisting of a burger, fries, and 12-ounce Coke, packed 590 calories; today's adult-sized combination meal packs 1,550.

Compounding the portion sprawl is the increasing rate at which Americans eat away from home. USDA's ERS reports that meals away from home rose by 9 percent from the late 1970s to the mid 1990s and continues to climb; 57 percent of Americans eat at least one meal away from home each day. Due to the types of foods and their preparations commonly found in away-from-home meals, the increase in total fat, saturated fat, and cholesterol are devastating.

These trends are not unique to American adults. Children are following similar patterns with one significant alarm point, sugar consumption. The USDA's report to Congress revealed that as children get older they are consuming more sugar while getting less calcium; only 13 percent of teenage girls are getting the calcium they need mainly because soda consumption has risen by over 48 percent.[cix]

If you thought children developed these bad eating habits solely through interaction with other kids and TV advertisements, think again. A study of 3,000 infants shows infants too are consuming inappropriate foods, affecting many aspects of early childhood development. One out of four babies between 19 and 24 months is not getting a single fruit and vegetable serving a day. The most egregious finding is that infants, i.e.,, babies, are being served soda.[cx]

In 2001, the Surgeon General of the United States characterized today's obesity rates as an epidemic.[cxi] Poor diets and other lifestyle factors account for a major share of morbidity and 14 percent of all deaths in the United States.[cxii] The annual cost associated with diet-related health conditions for medical needs and lost work productivity is $71 billion.[cxiii] The effect of the American diet on children is also disturbing. A USDA ERS survey showed that, over a 30-

year period, the number of children ages 6-11 classified as overweight increased by almost four times and adolescents, ages 12-19, has increased over twofold.[cxiv] Much like their adult counterparts, children's vegetable and fruit consumption are below the recommended allowance. The rise in soda consumption significantly increases the risk of dental caries and tooth enamel erosion due to the sugars and acids found in the product.[cxv] Given that calcium is essential to bone development, reduced bone mass can increase an individual's risk profile for osteoporosis later in life. Despite these alarming trends, some would prefer they continue.[cxvi]

Fighting obesity in America is one of Health and Human Services Secretary Tommy Thompson's top priorities. However, the Bush administration recently announced it would block a World Health Organization (WHO) initiative against obesity unless changes were made to it. Critics charge that the food and sugar industries are behind the administration's position as the current WHO plan calls for advertisement restrictions aimed at children and sinners fees through taxes on junk food and farm subsidy reductions.[cxvii]

The power of influence can reach all levels; profits from school vending machine sales are important to school finances. In one Texas school district, an exclusive agreement with one soft drink company is valued at $19 million.[cxviii]

Others who profit from these American eating styles invest billions of dollars to ensure their products remain popular among consumers. While the USDA annually spends $333 million projecting the message of good diet and nutrition, it is competing against a huge industry that puts over $70 billion forward for advertisement. USDA's budget is about the same amount spent on the advertisement of snacks.

At the beginning of the 20th century, people fell victim to diseases that science would eventually counter and in some cases, eradicate. Now a hundred years later, the U.S. is facing growing health epidemics that scientific advancement will not resolve, but changes in eating behavior will. If gone unchecked, losses to healthcare and lost productivity will continue to climb. The more these expenses climb, and obesity and other diet-related noncommunicable diseases increase, the more individuals will look towards the government for a solution; however, the real solution is personal responsibility. The food industry is not the cause behind these trends but it has responded to maintain market share. If people control their eating behaviors and mass together, they can challenge the food industry to change; after all, they are their customers.

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