

Putting the pieces together

Public policies and programs have ambitious aims: to improve the quality of life for some segment of society. Equally as ambitious, perhaps, are the research efforts involved in assessing whether a program is achieving its intended objectives. There are multitudes of methods to make such assessments, from scientifically controlled trials to purely subjective analysis. Complicating assessment further, numerous external factors—economic, social, even natural disasters—may influence, or counteract, the effects of a given program. Program evaluation can help us see how these pieces of the puzzle fit together.

Key to evaluating program effectiveness is to focus on its intended outcomes. What, for example, is the direct effect of a program on its participants? What is its benefit to society at large? Whether evaluating a research program, such as ours at ERS, or a multi-billion dollar assistance program, a few key questions can start to discern the program's effects: Did the program affect the knowledge, skills, behavior, or well-being of the people who participated in it? By extension, did the program have a positive effect on a social priority? Did it do so in an efficient, well-managed manner?

Economic research and analysis can contribute an important piece of the puzzle. Recent ERS research on traceability, for example, helps inform efforts to better understand and evaluate private and public traceability systems. The research reveals the elements of efficient traceability systems for product differentiation, food safety, and efficient supply management. This information can help policymakers evaluate proposals for publicly mandated traceability systems.

Such analyses are not merely of academic interest. In an era of increasing pressure for fiscal restraint and competing national priorities, publicly funded programs face the requirement, indeed the necessity, of demonstrating that they function effectively and provide benefits to society. More than 10 years ago, the Government Performance and Results Act codified into law such a requirement. Presidential initiatives offered by successive administrations have also demanded improved program performance and accountability to taxpayers. Insights discovered through economic research, therefore, can help inform evaluations for these and many other efforts that seek to fit together pieces of a puzzle to understand the interaction of policies and the food and agriculture system.



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Measuring the Success of Conservation Programs

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Most conservation programs are designed to improve the environment by changing farmers' practices (through incentives). But, the path from programs to practices to environmental quality is complex. Determining whether programs are successful requires careful navigation of the complex series of interactions that link programs and environmental quality.

Over the last two decades, the European Union has emerged as a leader in agricultural trade, competing with the U.S. for the rank of top agricultural exporter. But its success has created budgetary and trade pressures for comprehensive reforms. How will the latest agricultural policy changes in the EU affect the region's dominance in world markets?

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Slow Price Adjustment Benefits Beef and Pork Producers

Ken Hammond, USDA

“Price spreads”—the difference between what consumers pay for food and what the farmer earns for the raw material producing it—have trended upward but fluctuated widely over the past 10 years. These trends raise suspicions that intermediaries are taking undue profits at the expense of farmers and consumers. A recent ERS report analyzes price spreads for beef and pork and their impacts on livestock prices.

Price spreads fluctuate a great deal from month to month. These fluctuations are consistent with partial or “dynamic” price adjustment. In other words, farm prices respond slowly to changes in supply and demand conditions. Dynamic price adjustment makes beef and pork prices more stable than they would be if prices adjusted quick-

ly. But price spreads are less stable as a result, since farm, wholesale, and retail prices adjust at different rates. Farm, wholesale, and retail prices for beef and pork also show “asymmetric” price adjustment—prices adjust more rapidly when they are increasing than when they are decreasing.

It takes 2 months for the farm price of hogs to fully adjust to price-increasing changes and 5 months to price-decreasing changes. Cattle prices adjust more slowly: increases take 18 months and decreases 29 months. The slow rate and asymmetric nature of price adjustment could be considered evidence of problems in the flow of information through the markets. Ironically, however, improved information flows and speedier price adjustment might not help

livestock producers. Because prices adjust more quickly upward than downward, actual livestock prices tend to be higher than prices would be if they adjusted more rapidly. The slow and asymmetric adjustment of cattle prices keeps them about 4 percent higher on average than they would be under complete adjustment. Hog prices average around 1 percent higher. \surd

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This finding is drawn from . . .

Beef and Pork Values and Price Spreads Explained, by William F. Hahn, LDP-M-11801, USDA/ERS, May 2004, available at: www.ers.usda.gov/publications/ldp/apr04/ldpm11801/

Structural Change Brings New Challenges to Soybean Price Forecasts

South America has surpassed the U.S. in soybean production and displaced the U.S. as the dominant player in the global soybean market. Its emergence as a major U.S. competitor has put downward pressure on U.S. prices, changing the market dynamics of the soybean sector and the economic relationships that have traditionally been used by USDA for price forecasting. USDA forecasts of the season-average price received by U.S. farmers are an essential tool for government budgeting. These price forecasts are also used by industry analysts and farmers for planning and decisionmaking.

Fundamental to the models used by USDA to forecast soybean prices is a strong economic relationship between U.S. commodity prices and the ratio of U.S. carryover stocks to use—the higher the stocks relative to use, the lower the price. But with the rise of South American soybean production, this relationship has lost some of its predictive power. Forecasting equations that proved reliable for years are now less accurate, and commodity analysts have to rely much more on ad hoc adjustment factors to account for the structural change. Analysts need a more rational system for forecasting U.S. season-average soybean price that incorporates the impact of increased South American soybean production.

Recent ERS research found that using South American soybean production in addition to the U.S. carryover stocks-to-use ratio helps to better forecast U.S. soybean prices. Increases in either variable will lower the expected price. The equation estimates that a 1-percent increase in the carryover stocks-to-use ratio reduces the U.S. season-average price by about 0.4 percent and that a 1-percent increase in South American production reduces the U.S. soybean

season-average price by about 0.5 percent. The latter estimate is the direct effect of South American production on the U.S. soybean price.

But, the U.S. carryover stocks-to-use ratio adjusts downward in response to increased South American production. Increased South American production may result in less need for U.S. carryover stocks (though the exact relationship between South American production and U.S. stocks is a researchable question). Regression analysis of the data indicates that a 1-percent increase in South American production reduces the U.S. carryover stocks-to-use ratio by about 0.6 percent. The 0.6-percent reduction in the U.S. stocks-to-use ratio from a 1-percent increase in South American production, plus its direct effect on the U.S. price, reduces the U.S. soybean price by a composite of about 0.25 percent.

Expanded competition from South America is having a significant impact on the soybean market and on soybean price-forecasting models. ERS analysis shows that the U.S. stocks-to-use ratio and South American soybean production were important variables for forecasting price. Further, the indirect effect of South American production on the U.S. soybean price should be considered when making price forecasts and when budgeting for government payments. \mathbb{X}

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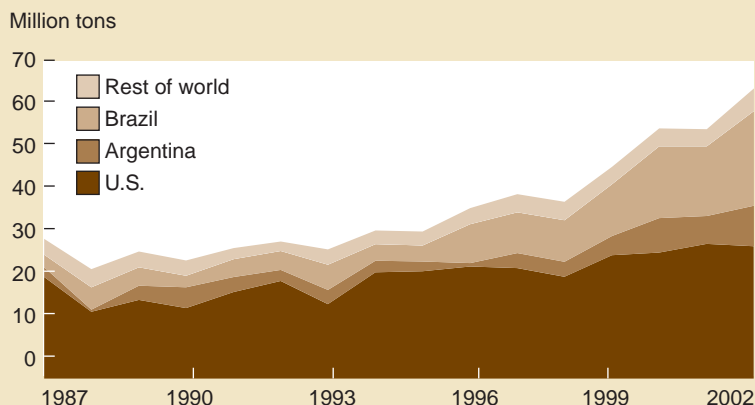
This finding is drawn from . . .

How Does Structural Change in the Global Soybean Market Affect the U.S. Price? by Gerald Plato and William Chambers, OCS-04D-01, USDA/ERS, April 2004, available at: www.ers.usda.gov/publications/ocs/apr04/ocs04d01/



Scott Bauer, USDA/ARS

South American soybean exporters bring new competition for U.S. soybean growers





Corbis

Do Local Food Stamp Offices Improve Access for the Working Poor?

might affect households' decisions to apply for food stamps or continue participating. According to the survey, staff attitudes toward the working poor are generally positive and many practices had been adopted to encourage participation in the program. In offices serving most of the national caseload, none of the interviewed

supervisors or caseworkers agreed with the statement, "the Food Stamp Program encourages dependency." Staff were nearly unanimous in the opinion that eligible households leaving cash welfare for employment should be encouraged to apply for food stamps.

Local offices were also generally accessible. Sixty percent of the national caseload were served by offices near public transportation, and free parking was available at almost all offices. Persistent waiting lines were a problem in offices serving 14 percent of the caseload but never a problem in smaller offices with fewer than 2,000 clients. Many offices operated outside of normal office hours (before 8 a.m., after 5 p.m., or on Saturdays). For example, offices serving 51 percent of the caseload accepted applications during extended hours, and offices serving 43 percent of the caseload

conducted eligibility interviews during extended hours.

Some practices hindered the working poor's willingness to seek out food stamps. For example, at the time of the survey, local offices were more likely to assign short certification periods (3 months or less) to households with earnings, requiring them to re-apply for food stamps more often than nonworking households. In addition, offices serving about half of the caseload required that employers complete a form to verify income. The survey found that the working poor were less likely than the elderly, the disabled, immigrants, or the homeless to be targeted with public education campaigns, to receive transportation assistance, and to be allowed to apply by telephone. \forall

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This finding is drawn from . . .

Food Stamp Program Access Study: Local Office Policies and Practices by Vivian Gabor, Brooke Layne Hardison, Christopher Botsko, and Susan Bartlett, ERS project representative: Margaret Andrews, E-FAN-03-013-1, prepared for USDA/ERS by Health Systems Research, Inc., and Abt Associates Inc., December 2003, available at: www.ers.usda.gov/publications/efan03013/efan03013-1/

In 2003, USDA's Food Stamp Program (FSP) provided assistance to an average of 9.2 million low-income households per month. In about a quarter of these households, at least one member was working at a job, though their low earnings still left them eligible for FSP benefits. Even so, nearly half of working households eligible to participate did not. The reasons for not participating vary—lack of knowledge about the program, low benefits, fear of being stigmatized, inaccessible offices, and burdensome requirements, to name a few.

Food stamp benefits are federally funded, with uniform national requirements for eligibility and benefits. However, State and local social services offices administering the program exercise substantial latitude in how they deliver services.

ERS sponsored the first nationally representative survey of local food stamp offices in June 2000 to document the operational practices used by local offices that

Let's Eat Out: Full-Service or Fast Food?

Fast food and full-service restaurants are jockeying for the consumer's away-from-home food dollar. To win customers, many restaurants of both types are offering dining experiences richer in a variety of foods and services. Applebee's Neighborhood Grill & Bar, a full-service restaurant, for one, reports that new menu items account for over 50 percent of its offerings. Even some fast food chains, such as McDonald's, now offer dozens of items on their "limited" menus. Although many factors could be contributing to the evolution of the foodservice industry, these developments point to changes in what consumers are demanding.

ERS research suggests that, between 2000 and 2020, Americans will increase their spending by about 18 percent per person at full-service restaurants, and about 6 percent per person at fast food establishments. These predictions are based on a statistical model that incorporates the changing demographics of the U.S. population—most importantly, rising incomes, a decrease in the proportion of "traditional" households, and an increase in the average age.

If household incomes were to grow by 1 percent annually on an inflation-adjusted basis, by 2020, this development alone would foster a 17-percent increase in per person spending at full-service restaurants and a 7-percent increase at fast food places. Higher income people tend to spend more money on food away from home, especially on full-service dining.

The traditional household, defined as a married couple with children, typically spends less money per person on away-from-home foods than either a single-person household or a household with multiple adults but no children. Traditional families accounted for 30 percent of all households in 1980 and 24 percent in 2000. By 2020, they are expected to account for 17 percent of all households. This change alone will lead to increased spending of 2 percent per person at both full-service and fast food places.

Not all demographic changes bode well for both types of restaurants. The aging of the population is likely to reduce per capita spending by 2 percent at fast food places but to have little effect on the demand for meals and snacks at full-service restaurants. \mathbb{W}



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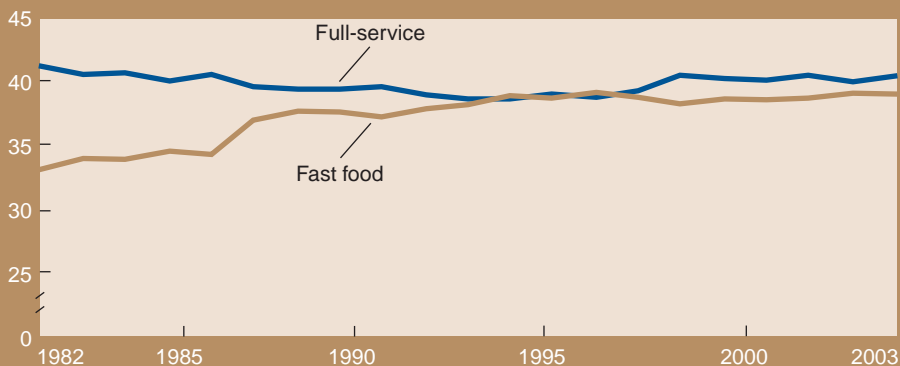
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AMBER WAVES

Full-service restaurants regain some market share

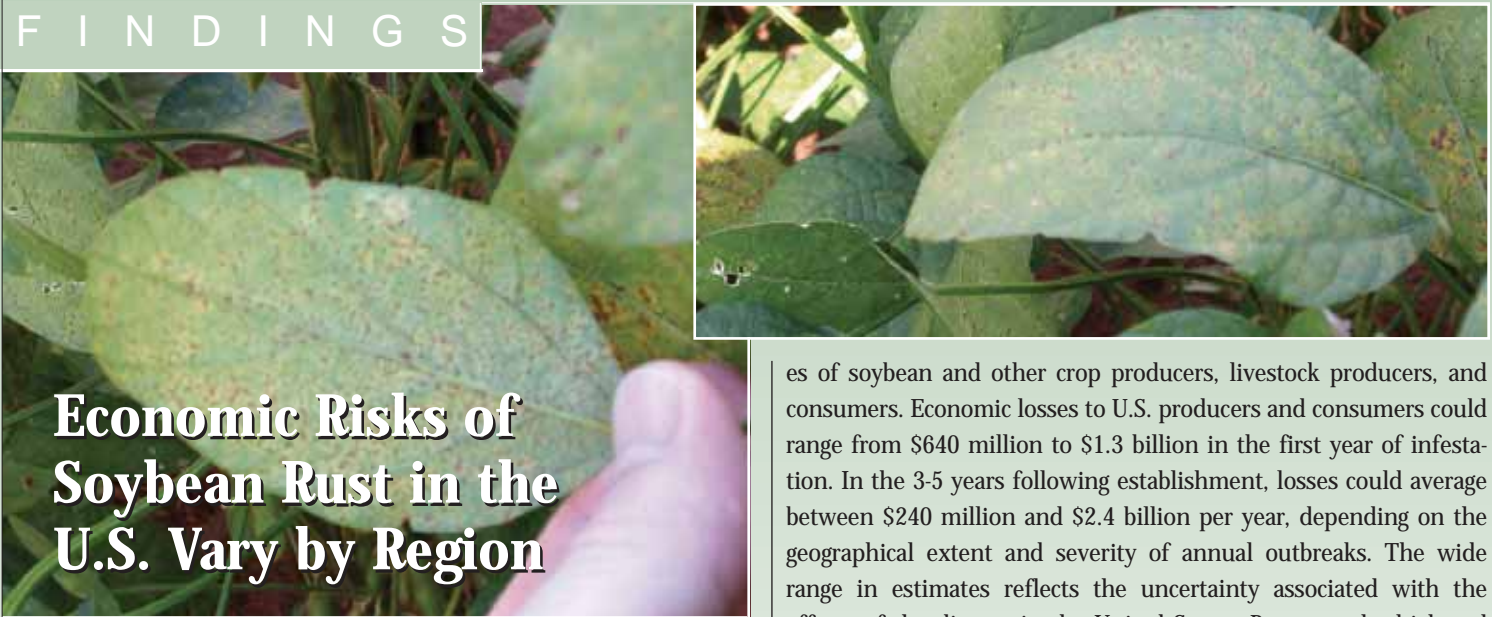
Percent of sales



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This finding is drawn from . . .

The Demand for Food Away From Home: Full-Service or Fast Food? by Hayden Stewart, Noel Blisard, Sanjib Bhuyan, and Rodolfo M. Nayga, Jr., AER-829, USDA/ERS, January 2004, available at: www.ers.usda.gov/publications/aer829/



Economic Risks of Soybean Rust in the U.S. Vary by Region

Photos courtesy of M.A. Draper, Parana State, Brazil

Soybean rust is a plant disease that has reduced yields and raised production costs for soybeans and other legumes in every major production region of the world—except the United States. However, with the recent and rapid spread of the windborne pathogen in South America, most experts agree that the question isn't if, but when, it will enter the U.S. via natural spread. An outbreak could pose economic risks for producers and consumers, and affect agricultural and environmental programs, such as crop insurance, commodity programs, research and extension, and pesticide regulations.

An ERS study shows that the economic effects of the pathogen's entry into the U.S. could vary considerably, depending on the timing, location, spread, and severity of the disease and on the respons-

es of soybean and other crop producers, livestock producers, and consumers. Economic losses to U.S. producers and consumers could range from \$640 million to \$1.3 billion in the first year of infestation. In the 3-5 years following establishment, losses could average between \$240 million and \$2.4 billion per year, depending on the geographical extent and severity of annual outbreaks. The wide range in estimates reflects the uncertainty associated with the effects of the disease in the United States. But even the high-end estimates are less than 1 percent of the total economic activity associated with U.S. soybean production and consumption—a finding that confirms the resiliency and adaptability of U.S. agriculture.

Soybean producers would likely bear 60-70 percent of the costs of adjusting to periodic soybean rust outbreaks in the U.S., with consumers and livestock producers bearing the balance. The outbreaks would likely cause agricultural producers, especially soybean growers, to change production practices (for example, to use fungicides and, for some, to alter their crop mix). While producers would have limited management options during the first year of a rust outbreak, these options could increase over time as producers gain new information or as new pest management technologies become available.

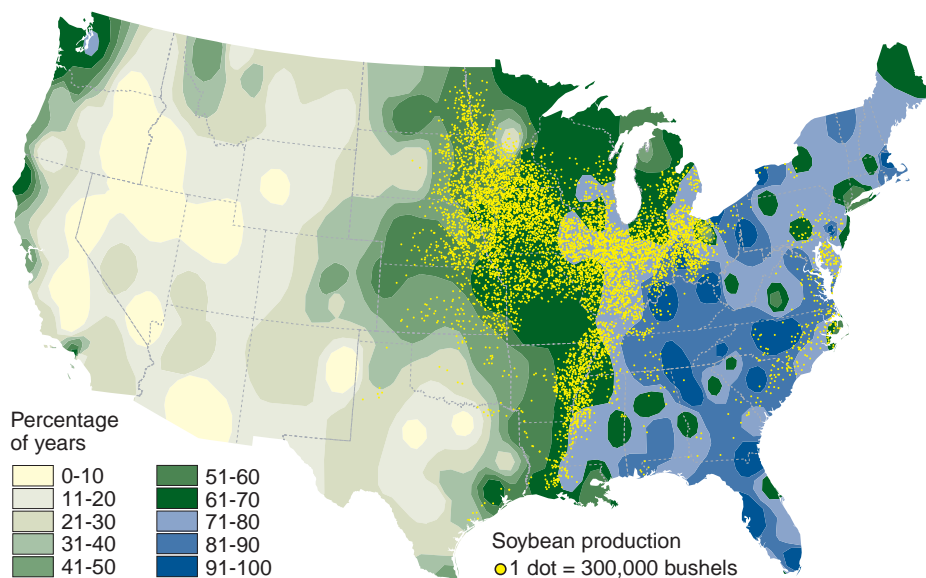
The effects of the disease could vary considerably by region. For example, the Eastern U.S. may be more susceptible than other regions to rust infestation because of temperature, relative humidity, and rainfall during the growing season. Fortunately, most U.S. soybean production occurs in the middle part of the country where climate is less supportive of infestation. \mathcal{W}

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This finding is drawn from . . .

Potential Economic and Policy Implications of the Wind-Borne Entry of Asian Soybean Rust into the United States, by Michael Livingston, Rob Johansson, Stan Daberkow, Michael Roberts, Mark Ash, and Vince Breneman, OCS-04D-02, USDA/ERS, April 2004, available at: www.ers.usda.gov/publications/ocs/apr04/ocs04d02/

Percentage of years out of 30 that climatic conditions are expected to support establishment of soybean rust



Source: USDA's Animal and Plant Health Inspection Service and National Agricultural Statistics Service.

Genetically Engineered Crop Varieties Gain Further Acreage Share in 2004

Genetically engineered varieties of soybeans, corn, and cotton have been available commercially since 1996. Since then, their rate of use by U.S. farmers has climbed most years, including 2004. For the most part, farmers have adopted herbicide-tolerant (HT) varieties, which help control weeds, at a faster pace than insect-resistant varieties, which help control insects.

Weeds are such a pervasive pest for soybeans, corn, and cotton that over 90 percent of planted acreage for each crop was treated with herbicides in recent years. Crop varieties with HT genes can survive certain potent herbicides that previously would have destroyed the crop along with the weeds, giving farmers who adopt HT

varieties a powerful new tool to control weeds. Acreage share for HT soybeans, which reached 85 percent of U.S. soybean acreage in 2004, has expanded more rapidly than acreage shares for HT varieties of cotton and corn. Farmers' adoption of HT soybeans has been widespread among major growing States, ranging in 2004 from 75 percent in Michigan to 95 percent in South Dakota. Acreage share for HT cotton has also expanded rapidly, reaching 60 percent in 2004. In contrast, acreage share for HT corn reached only 18 percent in 2004, but this is still an increase from 15 percent in 2003.

Insect-resistant crops contain a gene from a soil bacterium, *Bacillus thuringien-*

sis (Bt), which produces a protein toxic to specific insects. Acreage shares for Bt cotton and corn are lower than those for HT soybeans and cotton and vary much more across producing States, with adoption more concentrated in areas with high infestations of targeted pests. Farmers planted Bt cotton—which controls tobacco budworm, bollworm, and pink bollworm—on 46 percent of cotton acreage in 2004. Acreage share ranged from 13 percent in California to 86 percent in Louisiana. Bt corn, originally developed to control the European corn borer, was planted on 32 percent of corn acreage in 2004, up from 29 percent in 2003 and 24 percent in 2002. These recent increases in acreage share may be largely due to the commercial introduction in 2003/04 of a new Bt corn variety that is resistant to the corn rootworm, a pest that may be more destructive to corn yield than the European corn borer. ∞

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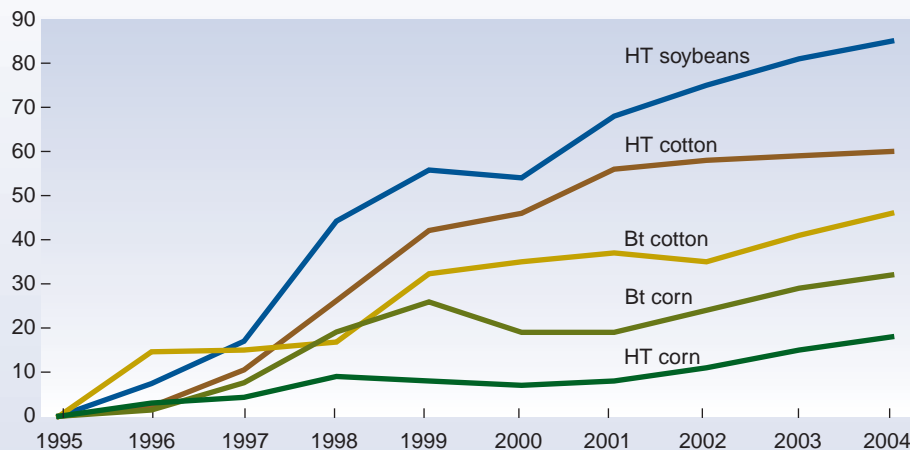
This finding is drawn from . . .

Adoption of Genetically Engineered Crops in the U.S., available at: www.ers.usda.gov/data/biotechcrops/

Pest Management in U.S. Agriculture, by Jorge Fernandez-Cornejo and Sharon Jans, AH-717, USDA/ERS, October 1999, available at: www.ers.usda.gov/publications/ah717/

Adoption of GE crop varieties has been highest with HT soybeans and cotton

Percent of planted acres of each crop



HT = herbicide-tolerant traits. Bt = insect-resistant traits. Data for each category include varieties with both HT and Bt traits.

Source: USDA annual surveys.

PERFORM

OF THE

BUDGET

Curtia Taylor, USDA/ERS

Eyewire

Federal Funding in Rural America: Who Gets What?

Federal spending and credit programs can revive or sustain rural economies. Which regions or geographic areas benefit the most from Federal funding? This question can be answered by examining the geographic distribution of Federal funds by type of Federal program. For example, high-poverty areas, such as Appalachia and the Mississippi Delta, have received above-average levels of income security payments such as food stamps and Social Security. However, these distressed areas received below-average payments from Federal community resources programs that contribute to local infrastructure, housing, and business assistance—programs crucial to economic development.

The principal source for Federal funds data is the Consolidated Federal Funds Reports data from the Census Bureau. ERS aggregates the latest available data (fiscal year 2001) to the county, State, regional, and national levels for each program and computes per capita estimates by type of nonmetropolitan (nonmetro) county. Overall, nonmetro areas received slightly less funding per capita (\$6,020) than

metropolitan (metro) areas (\$6,131), but the amount of funding varied greatly by type or function of the program. Nonmetro areas benefited disproportionately from agriculture and natural resource program payments, income security payments (including Social Security and food stamps/other assistance to low-income individuals), and human resources programs. In contrast, metro areas benefited more from community resources programs (including infrastructure, housing, and business assistance), defense and space programs (the largest of the national programs), and national (nondefense) function programs such as criminal justice and law enforcement, energy, and higher education and research.

So which regions get what in rural America? Total Federal funding was highest in the South (\$6,660 per capita) and lowest in the Midwest (\$5,566 per capita), but this pattern did not hold up for nonmetro areas. The nonmetro West received the most (\$6,129 per capita) due to higher-than-average payments from community resources and national functions as well as relatively high funding from human resources and defense/space functions. On the other hand, the nonmetro Northeast received the lowest funding (\$5,512 per capita) as a result of lower-than-average payments for agriculture and natural resource programs.

Federal funds data indicate the types of rural places that are particularly affected by the various programs. The data can be used to address many questions about rural communities receiving funds and can help rural development programs target rural areas in need of assistance. *W*

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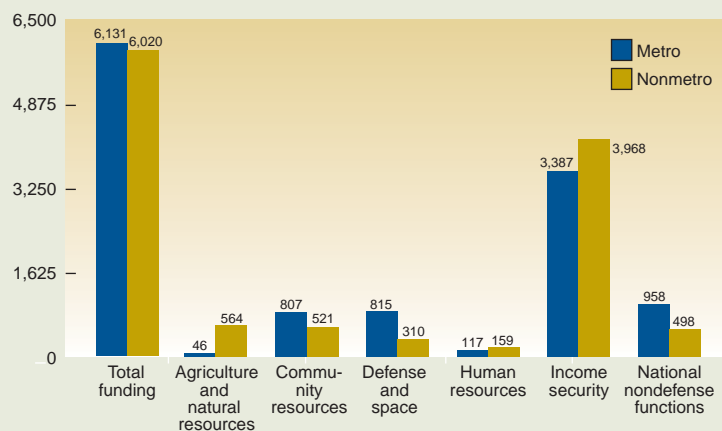
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For more information on the geographic distribution of Federal funds, including definitions used here for county types, regions, and program types and functions, visit the Federal funds briefing room:

www.ers.usda.gov/briefing/federalfunds/

Per capita Federal funding by major function, fiscal year 2001

Dollars (\$1,000)

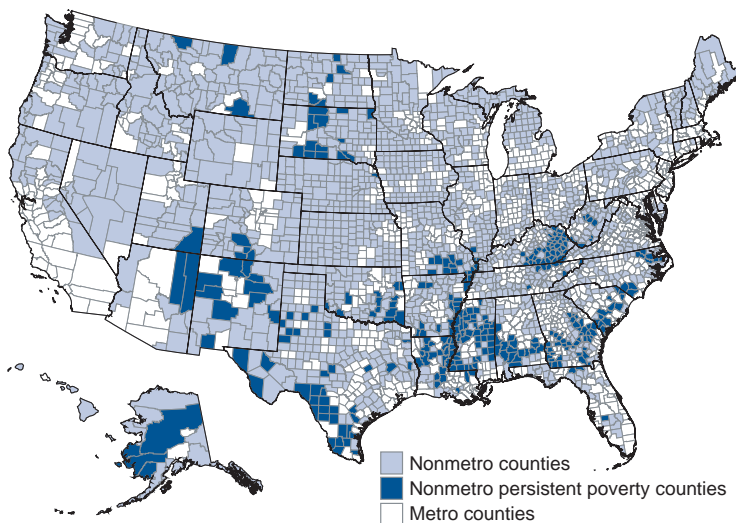


Source: ERS, using Consolidated Federal Funds Report data from the U.S. Census Bureau.

Persistent Poverty Is More Pervasive in Nonmetro Counties

During the 1990s, America experienced unprecedented economic growth, and the national poverty rate declined from a decade high of over 15 percent in 1993 to a low of 11.3 percent in 2000. A brief recession in 2001 led to an increase in poverty, with the most recent estimates indicating that just over 12 percent of the American population was poor in 2002. Not only is the poverty rate an important social indicator of the well-being of the least well off, but it is also a primary input for shaping many Federal policies and targeting program benefits.

The majority of nonmetro persistent poverty counties are in the South



Source: Map prepared by ERS from U.S. Census Bureau data.

Poverty is not distributed equally across the United States. Although most of the Nation's poor live in metropolitan (metro) areas, poverty rates have been consistently higher in nonmetropolitan (nonmetro) areas in every year since the 1960s, when poverty rates were first officially recorded. Even with similar patterns of change in poverty rates over time, a metro-nonmetro gap in poverty rates persists. In the 1980s, the average incidence of poverty was 4.4 percentage points higher in nonmetro areas than in metro areas. During the 1990s, the gap declined and the average difference fell to 2.6 percentage points.

Time is an important dimension of poverty: Someone who is poor today but not tomorrow may be better off than someone who is poor today *and* poor tomorrow. To shed light on this aspect of poverty, ERS defined counties as being persistently poor if 20 percent or more of their populations were living in poverty over the last 30 years (measured by the 1970, 1980, 1990, and 2000 decennial censuses). This definition yielded 386 persistently poor counties in the U.S., representing 4 percent of the U.S. population. A majority (340 of 386) of the persistent-poverty counties are nonmetro counties. Persistent poverty is also more pervasive in the most rural areas, as seen in the share of counties that were persistently poor—4 percent of metro counties, 13 percent of micropolitan counties (the more urbanized nonmetro counties), and 18 percent of noncore, nonmetro counties (the most rural of nonmetro counties). (For more information on these classifications, see "Behind the Data" in *Amber Waves*, September 2003.)

A strong regional pattern of poverty and persistent poverty also emerges. No persistent-poverty counties are found in the Northeast, and only 60 of the nonmetro persistent-poverty counties are in the Midwest and West. The remaining 280 nonmetro persistent-poverty counties are in the South, comprising 25 percent of the total nonmetro population there. Furthermore, the nonmetro South, with over 40 percent of the U.S. nonmetro population, has a significantly higher incidence of poverty. Poverty estimates for 2002 indicate that, in the South, 17.5 percent of nonmetro residents were poor compared with 14.2 percent of all nonmetro residents. Understanding differences in poverty between nonmetro and metro areas of the U.S. is important to understanding differences in well-being across these areas and can help inform the policy dialogue on poverty reduction strategies. *W*

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This finding is drawn from . . .

Rural Poverty at a Glance, by Dean Jolliffe, RDRR-100, USDA/ERS, July 2004, available at: www.ers.usda.gov/publications/rdr100/

The Changing World Network of Trade in Textiles and Apparel

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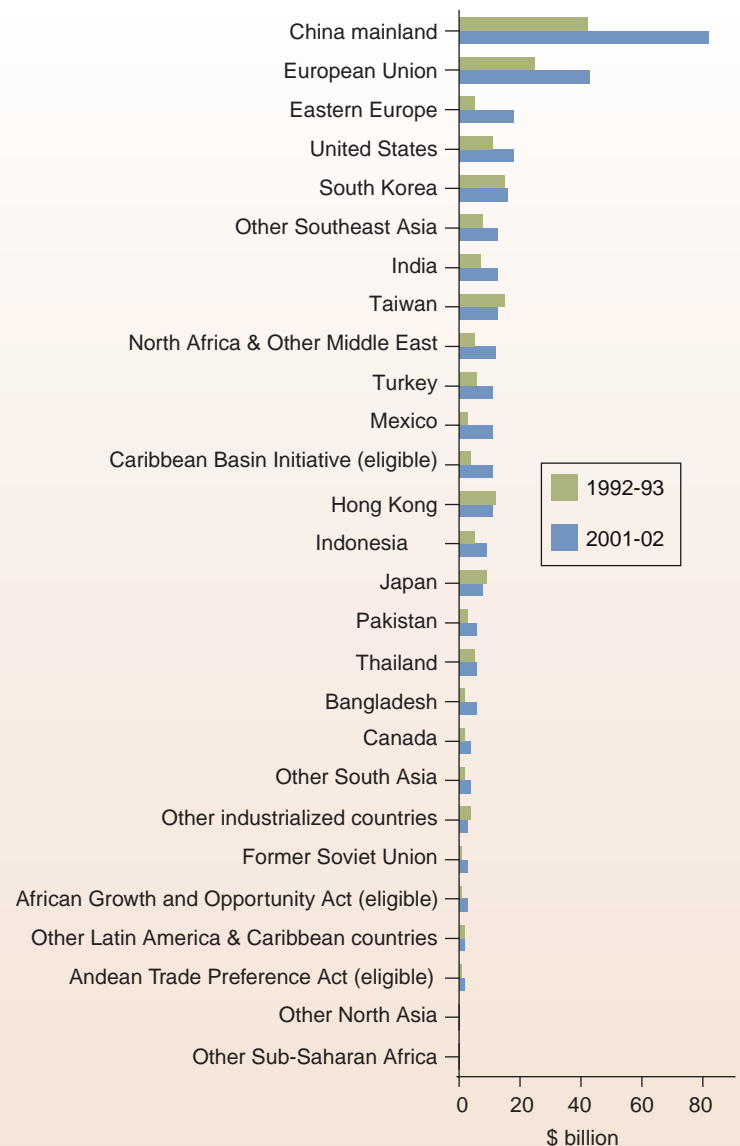
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The structure of the global textile market is fundamentally changing in response to policy reforms stemming from the 1995 Uruguay Round (UR) of the World Trade Organization. The UR instituted agreements to reduce tariffs on textile and apparel products to levels closer to those found elsewhere in manufacturing. It also established the Agreement on Textiles and Clothing (ATC), which stipulates that all bilateral import quotas, sanctioned under the 1974 Multi-Fiber Arrangement (MFA), will be eliminated by 2005. Full implementation of the UR reforms will bring textiles and apparel into greater conformity with internationally accepted rules of trade. Collectively, these reforms should stimulate growth in textile trade, which already outpaces trade in other sectors of the world economy. For example, trade in textiles and apparel in the last decade nearly doubled to \$334 billion. These reforms also promise to significantly alter the location of production and the direction of fiber and textile trade.

The Bilateral Fiber and Textile Trade database, available on the ERS website (www.ers.usda.gov/data/fibertextiletrade/), enables analysts to examine the evolving structure of trade among partners and across commodities and products in the global market. This database, derived from UN Comtrade data, contains information about commodity and product trade flows among exporting and importing countries/regions between 1992 and 2002.

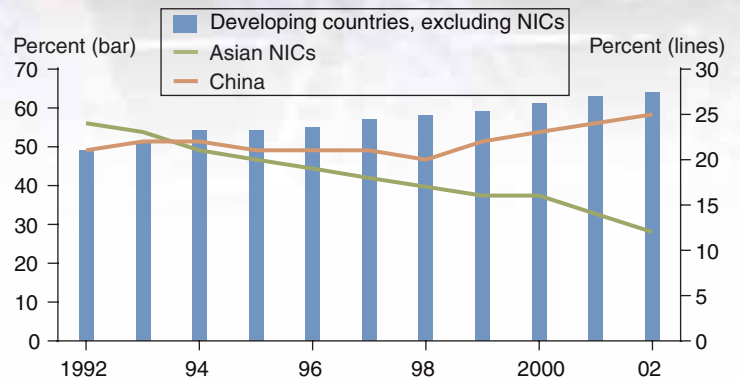
The global network of trade in textiles and apparel has shifted significantly, with many low-income countries benefiting from higher sales within the past decade. Unlike agricultural production, which depends on the availability of natural resources, the location of textile and, particularly, apparel production is highly mobile and extremely responsive to wage differentials. Textile and apparel production requires substantial labor, is not technologically demanding, and provides employment opportunities for the relatively unskilled laborers who transfer out of subsistence agriculture. It introduces workers to manufacturing and provides them with training opportunities in new and productivity-enhancing activities.

Changing global network of textile and apparel exporters



Competition from low-cost suppliers in developing countries has put considerable pressure on established exporters of textiles and apparel, particularly those in the newly industrialized countries (NIC) of Asia (Hong Kong, Macau, Singapore, South Korea, and Taiwan). The Asian-NIC share of the global textile and apparel market halved, falling from 24 to 12 percent between 1992 and 2002. In contrast, the market share of developing-country suppliers, excluding the Asian NICs, increased 15 percentage points to 64 percent during this period. China was especially successful, raising its share of the global market to 25 percent in 2002, up 4 percentage points from 1992. Such competitive pressures from low-cost, developing-country suppliers are likely to accelerate following the elimination of MFA quotas by 2005.

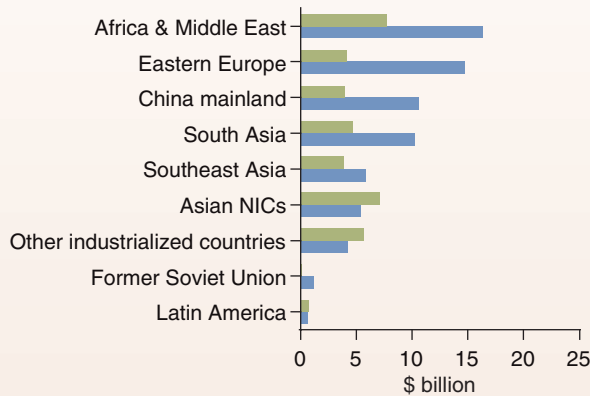
A changing of the guards: some suppliers losing market share while others increasing their shares



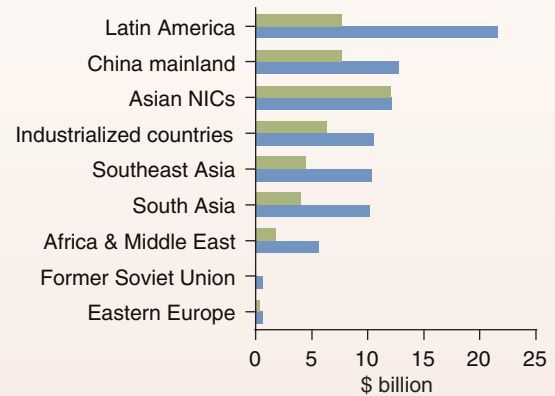
Textile and apparel trade is strongly influenced by established networks and geographical proximity. Together, Africa, the Middle East, and Eastern Europe dominate the EU market because of preferential trading agreements and the economics of geographical location. In contrast, the most

important suppliers to the United States are Latin America, China, and the Asian NICs. With improved market access from the ATC, low-income Asian producers are likely to vie more effectively with these traditional suppliers for foreign market shares in the U.S. and EU markets.

Source of EU textile and apparel imports

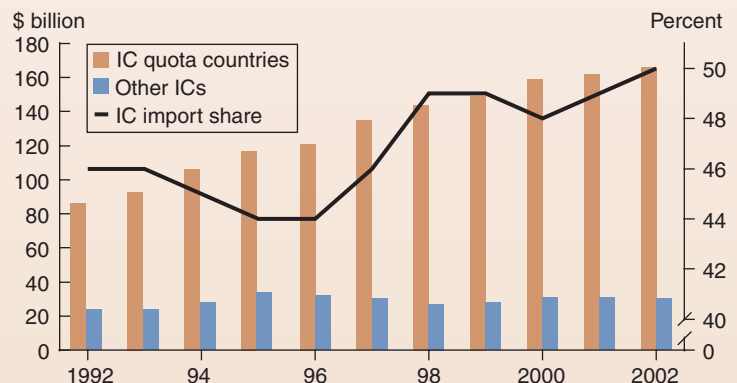


Source of U.S. textile and apparel imports



The UR reforms are expected to reduce prices for textiles and apparel, increasing worldwide demand for products throughout the fiber-to-clothing supply chain. Demand for textile and apparel imports is already rising rapidly among the industrialized countries (IC). This demand is particularly strong among importers using MFA quotas (Canada, EU, Norway, and the United States). As consumer prices fall due to ATC reforms, imports of clothing, bed linen, carpets, and other products are likely to continue to increase. Envisioned shifts in supply and demand for textile and apparel will enhance labor productivity in the developing countries, leading to income growth and greater global demand for agricultural products, including food and raw fibers, such as cotton.

Import demand for textiles and apparel is stronger in the industrialized countries (IC) and especially so for the quota-imposing nations



Measuring the Success of

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Defining and measuring success is easy—if you are Rube Goldberg. A widely acclaimed 20th century cartoonist, Goldberg depicted outlandish inventions that accomplished simple tasks through an intricate series of linked steps, each one triggering another until a desired outcome was reached. Success, in Goldberg's world, was clearly defined and could be attributed directly to the completion of several sequential, though highly improbable, cause-and-effect actions. Success, in the real world, even when it is clearly defined, is not so easily measured. Gauging the success of government programs, in particular, can be downright complicated, even when the

principles used in designing them are rather simple.

Most conservation programs, for example, are designed to improve the environment by offering incentive payments to farmers, who are thereby induced to change their farming practices. Those changes in farmers' practices—be they reducing pesticide use, adopting conservation tillage, or constructing a riparian buffer—should then lead to enhanced environmental quality. But, unlike the chain of events in a Goldberg invention, the actions involved in a conservation program take place not in isolation, but, rather, within a larger set of complex interactions, making it

difficult to link programs to actions to outcomes.

The first step in measuring the success of agricultural conservation programs—and other programs designed to address agri-environmental issues—is linking a change in farmers' stewardship behavior to the program being evaluated. Because many other factors (including other government programs) influence farmers' choices, it is critical to determine the extent to which it was a given conservation program incentive that stimulated some farmers to do something that they would not otherwise have done. A second step requires assessment of how the portion of

Conservation Programs

observed stewardship behavior that can be linked back to conservation program incentives then affects environmental quality—given that other factors also affect the environment.

Gauging Farm Operators' Responses to Program Incentives

Farm operators are the target of conservation program incentives, even though the program itself aims to target one or more environmental enhancements. Thus, to evaluate the program, one must determine exactly how program incentives induced operators of farms of various types, sizes, or features to “sign up” as program participants. Then, for

those who become program participants, it is important to find out how the type and extent of conservation practices they adopted relate to the levels of incentives provided through the program. Only by separating the influence of program incentives from other factors that affect farmers' conservation choices can the program evaluator be confident that it was the program being evaluated that had an effect, not other circumstances.

A farmer may adopt conservation practices for a myriad of reasons. He or she may be an ardent environmental steward who would implement a particular practice (like maintaining grassed buffers between cropland and water

sources) regardless of program incentives. Alternatively, a farmer may adopt an environmentally friendly practice wholly or partly in order to increase profits. ERS research on conservation tillage, for example, demonstrates that good stewardship can also be good business. Policy incentives aren't usually required to induce a farmer to adopt what he or she views as good business practice; market forces should do the trick in this regard.

In evaluating the effectiveness of incentives to induce farmers to participate in conservation programs, it is important to note that conservation programs are not implemented in a policy

vacuum. Both the costs and benefits of participating in a given program will vary as a direct result of the confluence with other government programs. For example, commodity programs influence some crop prices, making it more or less economically advantageous to manage the crops in ways that enhance environmental quality. Input use is sometimes controlled through quantity restrictions and use regulations. Input prices may also be influenced by policies—including labor laws, pesticide regulation, and subsidization of irrigation water—that influence relative input prices and, thus, the financial costs or benefits of conservation practices that shift input use patterns. Finally, technological change, economy-wide variables (such as interest rates and unemployment rates), and farm household constraints (such as the role of off-farm work in farm household income) are also likely to influence farmers' decisions about farming practices—whether or not a conservation program incentive is added to the mix.

Because farmers may adopt conservation practices for reasons unrelated to the conservation program, *simply identifying changes in farmers' practices (let alone environmental quality) is an insufficient basis for judging the success of a conservation program.* One has to be able to determine what proportion of farmers' practices can be attributed to a particular program before the success of the program can be assessed.

Isolating the effects of program incentives from the effects of other factors potentially influencing farmers' observed conservation practices demands a lot of data of particular sorts. A necessary requirement is the collection of data that enable statistically reliable comparisons of farming practices by farmers before and after program implementation, or by farmers who did and did not participate in the program in a given year or years. Statistical analysis of such data can support or refute

a correlation between farm practices and conservation program provisions.

However, supporting or refuting simple correlation is not sufficient because that correlation may be spurious and because it does not prove causality. A “before-and-after” comparison, for example, might miss the strong influence of a new program on participants' behavior if other factors, such as unusual weather conditions, prevented a large number of the participants from following through on their program-induced good intentions. Similarly, a “with and without” comparison could falsely attribute observed conservation practices to the conservation program if all farmer participants in the program were pre-inclined toward voluntary environmental stewardship even without the program, and nonparticipants were disinclined. More information is needed than simply who participated and what practices they employed if a strong case is to be made that the program was

the stimulus for farmers' adoption of observed practices.

Additional data are necessary to separate the effect of a conservation program incentive from the effects of concurrent changes in market prices, weather, other policies, and technology. Identifying the farmers for whom program incentives induced adoption of conservation practices requires data on the characteristics—types and locations—of both participating and nonparticipating farmers, the circumstances under which they made a participation decision, the amount of the incentive to which they did or did not respond, and regional and other variables.

A close look at outcomes associated with the Conservation Compliance provision of the 1985 Food Security Act reveals the importance of isolating the effects of the program in order to measure its success. The provision requires agricultural producers to implement soil conservation systems on highly erodible (HEL) cropland to remain eligible for farm program pay-



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Without protective measures in place, water and wind can lead to soil losses, which can harm farm fields and, through runoff, neighboring water bodies.

ments. Annual soil erosion on U.S. cropland declined by 40 percent between 1982 and 1997, suggesting that compliance mechanisms encouraged greater conservation effort. However, erosion also declined on cropland not subject to compliance requirements, demonstrating that other factors must also have played a role in reducing soil erosion. On farms for which conservation practices could have increased net returns to farming, for example, adoption may have eventually

occurred regardless of effects on soil erosion. In fact, after accounting for other factors, such as erodibility, commodity program payments, and land use changes, ERS research shows that only about 25 percent of overall erosion reduction between 1982 and 1997 could be directly attributed to Conservation Compliance. Even on the HEL lands targeted by the provision, about 11 percent of erosion reduction during that period was due to factors other than Conservation Compliance.

Linking Farmers' Choices to Environmental Quality

Measuring changes in farmers' practices that result directly from conservation program changes tells only part of the story. Conservation programs are not designed simply to induce a change in conservation practices, but to change those practices in order to improve water quality, air quality, wildlife habitat, or a host of other environmental attributes. More and more frequently, conservation programs aim to improve all of those environmental attributes at once.

Connecting the dots that link a program's incentives to success in achieving that program's environmental goal(s) is difficult in general, but can be especially challenging when evaluating conservation programs. Most of these programs address "nonpoint" sources of pollution, such as the nutrients, sediments, pesticides, and salts that enter water diffusely in runoff. In comparison to "point" sources, such as factories and municipal plants, which discharge through a pipe, ditch, or smokestack on which a meter can be installed, nonpoint sources are not so easily measurable and have an environmental effect only in the aggregate.

For example, the goal of a particular conservation program might be to address water quality problems caused by agricultural production. Evaluating a program based on that objective would require data on the entire set of actions and outcomes associated with agricultural production. Farmers control their inputs and crop production practices. Their management decisions, including which crop is produced on which field and with what combination of inputs, *can* affect water quality, but gauging whether or not and how much it actually *does* affect water quality is a difficult task. Farmers' decisions may lead to field-level emissions (through runoff or

leaching) of potential pollutants, such as sediments, nutrients, and chemicals, which are difficult to monitor. Depending on the location of the field and other physical and environmental factors, an emission may or may not find its way to the target water body.

But even that sequence of events is only part of the story. The last piece involves the underlying objective: What is it about water quality that concerns us? Is the goal to reduce nutrient concentrations in drinking water? Is it to provide improved fish habitat, perhaps to increase recreational fishing benefits? Once a (potential) pollutant reaches an environmental sink, such as a river or aquifer, it may or may not have ecological or human health implications, depending upon its toxicity, the number of other sources emitting the same pollutant, interactions with other pollutants, and the total emissions

simultaneously reaching the environmental sink. While scientists know much about the relationship between nitrogen runoff and tillage practices, and the effects of nitrogen levels on biological functions, less is known about how nitrogen is transported from a myriad of individual fields to specific water bodies or other sinks.

In evaluating the effects of a conservation program on environmental quality, the nonpoint source issue is compounded by the exceptional site specificity of many agri-environmental events. Soil losses (or other pollutants) at one location may have a different effect on the environment than an identical level and type of soil loss in another location. Furthermore, similar levels of environmental effects vary in value among locations depending upon the proximity of human populations or economic activity to the site of the damage. For example, if a program objective is to

help restore a recreational fishery, water quality improvements that increase fish populations closer to cities and where interest in fishing is particularly high will be higher valued than equivalent changes in fish populations in regions of the country that are sparsely populated or where interest in fishing is low. Estimating monetary-equivalent values for environmental improvement is a particularly difficult task that, while not necessary for judging whether or not a conservation program met its goals, is essential to determining how efficiently those goals were met.

Models Simulate What We Cannot Observe

Environmental process models can help overcome the nonpoint source and site specificity complications of conservation program evaluation by substituting predictions from models for direct observa-

Farmers' management practices affect ambient environmental quality. . .



Corbis

Lynn Betts, USDA/NRCS

Ken Hammond, USDA

tions of effects. For example, site-specific changes in (in-field) soil erosion due to particular erosion control practices can be estimated using the Universal Soil Loss Equation and the Wind Erosion Equation. Both models provide reasonably accurate results and require only minimal data (a total of six variables) describing climate, topography, soil, and cropping information at the field level. In contrast, models of nutrient and pesticide runoff are far more complex, simulating multiple environmental effects from the transport and fate of multiple pollutants into environmental sinks. These “fate and transport” models require a lot of data, often necessitating the use of dozens of variables.

Any one process model has unique advantages and disadvantages, depending on the indicator of interest, but relatively few are capable of simulating the environmental effects of changes in agri-

cultural practices on a national scale. (See box, “Some Agri-Environmental Process Models.”)

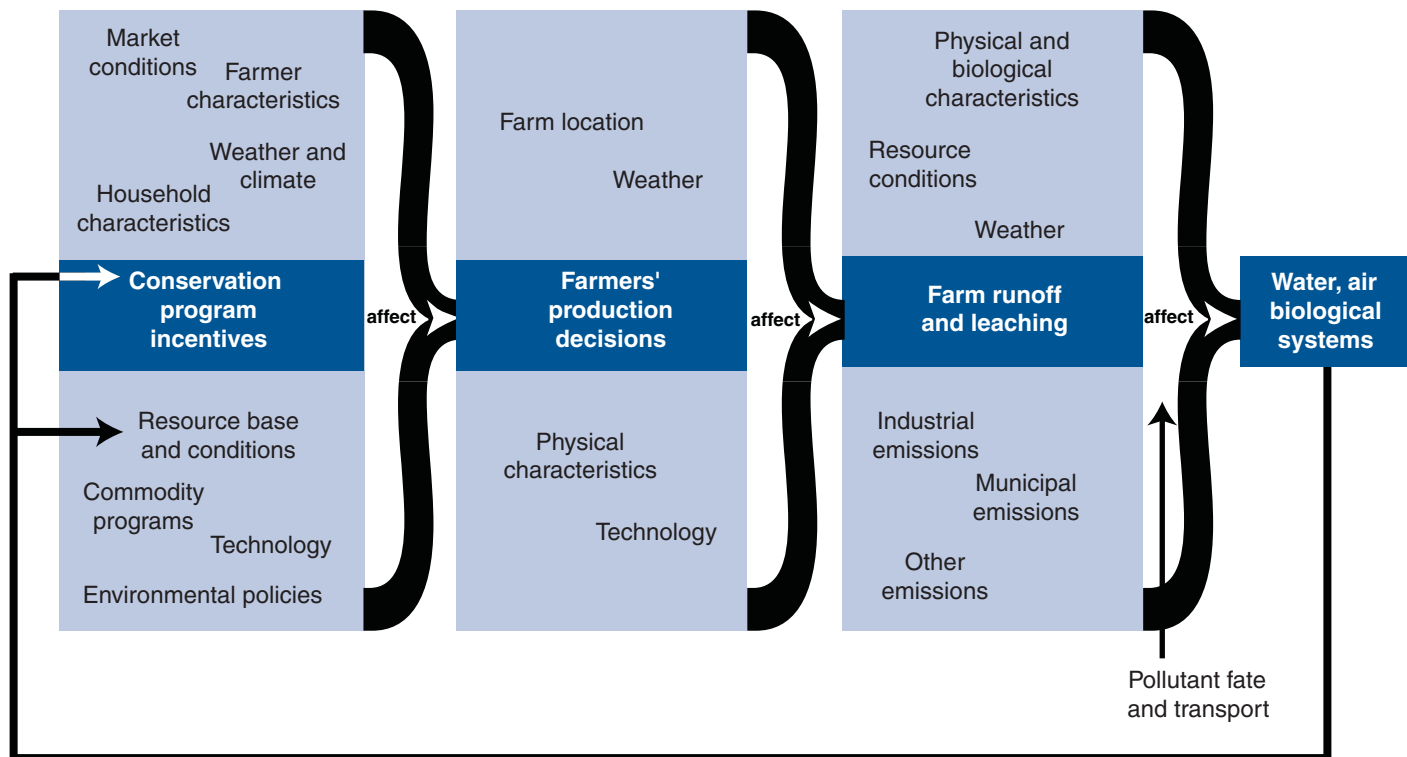
A final complication: Model results are unlikely to match real world observations because farming practices aren’t the only things that affect environmental quality. Floods or drought can damage the environment even under the very best management practices. A given level of runoff may cause no environmental damage in a wet year but may significantly harm fish and wildlife in a dry year when streams have insufficient flows to dilute the runoff to nonharmful levels. Likewise, a single watershed may well experience pollutant discharges not only from agriculture, but also from industrial sources, municipal water treatment plants, urban runoff, aerial deposition, and even natural seepage. Thus, the influence of unmodeled events needs to be extracted to recon-

cile simulation results with measurements made on the ground.

Identifying Appropriate Environmental Indicators

Just what *is* the best indicator by which to measure environmental quality change in the policy evaluation context? Regardless of whether it will be measured directly or simulated with an agri-environmental process model, the indicator(s) by which a given program will be evaluated must be carefully selected. Reflecting broadened public concerns, conservation programs increasingly target multiple environmental quality goals. Along with reductions in soil erosion, potentially measurable goals have expanded to include improved water quality and conservation of wetlands and wildlife habitat. Newer program objectives may include preserving open space, managing nutrients from fertilizers and livestock waste,

...but numerous other factors also affect environmental quality through a multistep process.



Some Agri-Environmental Process Models

A myriad of agri-environmental process models exist, ranging from simple linear calculations suitable for a handheld calculator to extraordinarily complex computer programs requiring high-powered machines and extensive training to operate, and from those calibrated to a single watershed to models developed to provide national-scale estimates. Three process models with acceptance among a wide range of analysts include one that is particularly comprehensive and predicts emissions at “edge of field” and two that attempt to link practices to water quality.

- USDA’s Erosion-Productivity Impact Calculator (EPIC)—a mechanistic simulation model used to examine long-term effects of various components of soil erosion on crop production. The model has several components: soil erosion, economic variables, hydrologic conditions, weather, nutrient composition, plant growth dynamics, and crop management (www.brc.tamus.edu/epic/).
- USDA’s Soil & Water Assessment Tool (SWAT)—a river basin scale model developed to predict the water quality impact of land management practices in large, complex watersheds. Required input data include weather, soils, crops, pesticides and nutrients (www.brc.tamus.edu/swat/index.html).
- U.S. Geological Survey’s SPAtially Referenced Regressions On Watershed Attributes (SPARROW)—a statistical model that relates in-stream water-quality measurements to spatially referenced characteristics of watersheds, including contaminant sources (such as farm fields) and factors influencing terrestrial and stream transport (<http://water.usgs.gov/nawqa/sparrow/>).

reducing pesticide runoff, improving air quality, reducing greenhouse gas emissions, or sequestering carbon in soil.

The appropriate indicator for evaluating a program’s success must map to an aspect of environmental quality that the program aims to address. But that’s not enough. It must also link directly to those changes in conservation practices induced by the program. For example, a measure of ambient downstream water quality, such as nitrogen concentration, may appear to be an ideal indicator of the success of a conservation program that aims to improve water quality. But if agriculture is only a small part of the aggregate water quality problem, ambient water quality may be getting worse, even with a wildly successful conservation program in place. The ambient water quality indicator may not measure the factor of interest, which, in this example, is *agriculture’s* contribution to water quality, and thus is not a

good choice for evaluating this agri-environmentally oriented program. In this case, a less direct measure of water quality, such as pounds of nitrogen discharged into the water body from farm fields, may actually be a better indicator.

Appropriate indicators are:

- Policy relevant—provide a direct link to both the environmental attributes of concern *and* the behavioral changes associated with the evaluated program incentives;
- Measurable—based on sound science and make use of data that are available or could feasibly be collected;
- Reasonably priced—cost-effective in terms of data collection, processing, and dissemination; and,
- Easy to interpret—communicate essential information to policymakers and other stakeholders.

Putting It All Together

The voluntary nature of most U.S. conservation programs, the human factors involved in farmers’ decisions to participate (and to what extent), the complexity of farm household decisionmaking, and the nonpoint source and site-specific nature of agri-environmental problems combine to make evaluation of conservation programs a data-intensive and technically challenging process. To be successful, program evaluations must answer both of the following questions explicitly, through estimated, simulated, or directly measured means.

1. How do different farm operators in different circumstances decide what to implement, in the presence and absence of the conservation program being evaluated, at different levels of incentives provided by that program?

Isolating the unique effect of conservation program incentives on farmers’ practices requires analysis to extract the influence of other (policy, household, general economic, etc.) factors that affect farm-level decisionmaking. This, in turn, requires evaluators to collect data on the full set of factors potentially affecting farmers’ decisions, in sufficient volume and across diverse farm and land types and locations, to allow statistical segregation of program-related effects from those of other influential factors.

2. How do the farm practices attributable to conservation program incentives affect environmental quality?

Isolating the unique effect of farm practices on environmental quality requires program evaluators to determine where, and under what resource conditions, practices implemented in response to the program are located, and to designate appropriate agri-environmental indicators for measuring program success. Process models that simulate the complexities involved in the



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Soil losses can be reduced through several means, including grassed waterways and conservation tillage.



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transport of agricultural runoff from multiple fields to environmental sinks may help link environmental performance with farm practices. But even then, additional analysis is required to reconcile model predictions with real world observations.

The complicated series of cause-and-effect relationships associated with conservation program evaluation seem beyond even the imagination of Rube Goldberg. Many factors must be accounted for to determine the portion of environmental enhancements directly attributable to program incentive-induced changes in farmers' practices. Still, carefully designed survey and monitoring programs encompassing each of those relationships in a coordinated fashion make such evaluation not only feasible, but well within reach. **W**

This article is drawn from . . .

Economics of Water Quality Protection from Nonpoint Sources: Theory and Practice, by Marc O. Ribaudo, Richard D. Horan, and Mark E. Smith, AER-782, USDA/ERS, December 1999, available at: www.ers.usda.gov/publications/aer782/

"Beyond Environmental Compliance: Stewardship as Good Business," by Jeffrey Hopkins and Robert Johansson, *Amber Waves*, USDA/ERS, April 2004, available at: www.ers.usda.gov/amberwaves/april04/features/beyondenvironmental.htm

"Have Conservation Compliance Incentives Reduced Soil Erosion?" by Roger Claassen, *Amber Waves*, USDA/ERS, June 2004, available at: www.ers.usda.gov/amberwaves/june04/features/haveconservation.htm



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European Union Adopts Significant Farm Reform

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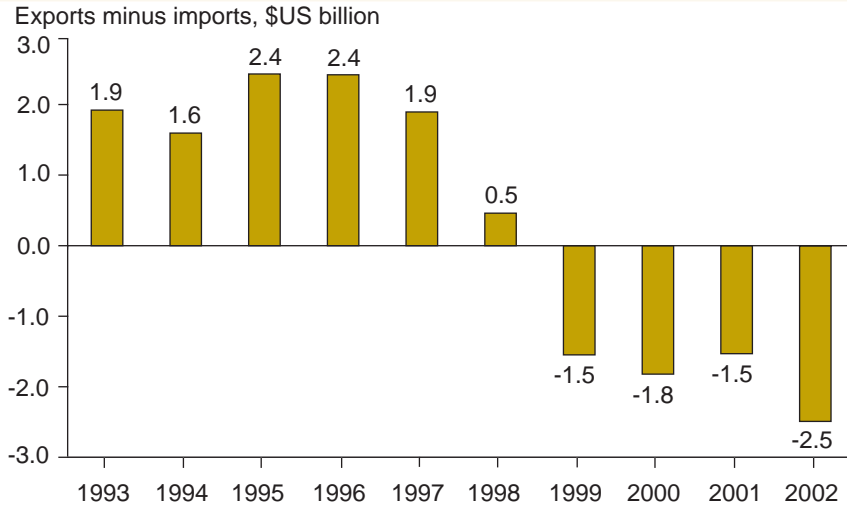
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In June 2003, the European Union (EU) adopted a program of agricultural policy reform, building on earlier agricultural policy reforms enacted since 1992. This program was expanded to include additional commodities in 2004. The policy changes under these recent reforms will dramatically alter the way that producers are supported and alter the incentive structure for EU farmers, but are likely to have modest impacts on EU production and consumption. The policy reforms will have implications for competition in global food and agricultural markets as well as for the EU's position in World Trade Organization (WTO) agricultural trade talks.

For decades, the United States and the European Union have dominated world agricultural markets. The U.S. has long been a leading producer and exporter of agricultural products, but in more recent years, the EU has

also become an agricultural trade powerhouse. As recently as the 1970s, the EU was a large net importer of nearly all major agricultural products, but by the 1980s, it had become a major exporter of wheat, sugar, meat, and dairy products. The EU now competes with the U.S. as one of the world's two top agricultural exporters. In the 2000-02 period, the U.S. and the EU together accounted for over a third of the world's agricultural exports, with the U.S. accounting for nearly 19 percent and the EU nearly 17 percent. The growing competitiveness of the EU is also reflected in the change in the balance in agricultural trade between the EU and the U.S., with the U.S. moving from an agricultural trade surplus to a substantial deficit. The EU however is still the world's largest agricultural importer and remains a net food importer, owing to its large and affluent population and small land base.

U.S. balance of agricultural trade with EU erodes



The EU's success in expanding agricultural production and exports is due in part to support provided to member states' producers under the Common Agricultural Policy (CAP). High and stable support prices guaranteed by the CAP, in combination with restrictive import policies for agricultural commodities, were a hallmark of the program since its inception in the 1960s. Thus, the CAP stimulated production and slowed consumption growth, leading to chronic surpluses that were exported with the aid of subsidies. The escalating costs of surplus disposal, however, led to a series of EU budget crises. In 1992, domestic budget constraints and external demands of multilateral agricultural trade negotiations pressured the EU to make substantial reforms to the CAP. The policy changes reduced support prices for selected commodities—primarily grains, oilseeds, protein crops, and beef—and introduced direct payments to producers based on crop area or cattle numbers to compensate for lower prices. Additional agricultural policy reforms were enacted under the EU's Agenda 2000 program, which helped prepare for EU enlargement by further reducing selected

support prices and compensating producers through direct payments.

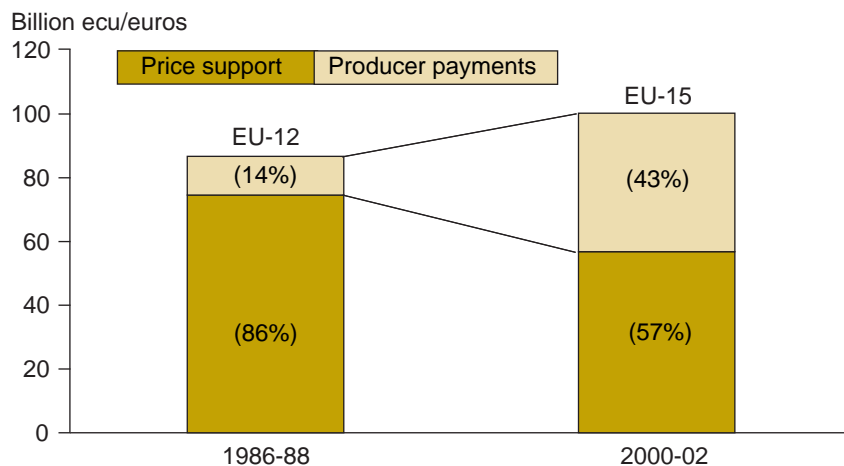
2003-04 CAP Reform Shaped by Environmental and Consumer Concerns

Like the earlier reforms, the June 2003 CAP reform was motivated by the agricultural negotiations in the WTO and the need to prepare for EU enlargement.

Like the previous reforms, the latest CAP reform is aimed at reducing current and potential commodity surpluses, assuring the EU's ability to stay within agricultural budget limits, and increasing the market orientation of EU agriculture by replacing some support prices with producer payments as the primary instrument of domestic support. However, the latest reform program was also motivated by new issues raised by consumers and environmentalists and recognized by policy-makers (and farmers) as important to the long-term well-being of EU agriculture—food safety and quality, animal welfare, and environmental concerns. The main features of the 2003 reforms and the April 2004 reforms include the following (for more details, see table):

- *Commodity support price reductions.* The new CAP reform continues the process of reducing support prices for selected commodities, eliminating price support for rye, and substantially cutting back support for rice, butter, and skim milk powder. The EU continues to support prices of major grains,

Producer payments grow as a share of total EU support to producers



Note: In 1986-88 the exchange rate was \$1.11 per ecu; in 2000-02 (after the ecu was replaced by the euro), it was \$0.92 per euro.

Source: Organization for Economic Cooperation and Development, Paris.

Policy changes under 2003 and 2004 CAP reforms

Program/commodity	Policy change
Crops	
Rye	Rye intervention price support eliminated. Rye-producing areas receive temporary transitional aid.
Grains	Minimum of 75 percent decoupled aid. Monthly storage increments to support price reduced 50 percent.
Durum wheat	Supplemental durum payment reduced in traditional producing areas, phased out for other areas. Payment included in single farm payment (SFP), but countries may opt to retain up to 40 percent linked to production. Durum quality premium paid on per hectare basis on limited area.
Rice	Intervention support price reduced by 50 percent, intervention purchasing limited. Direct income payment; part included in SFP, part converted to crop-specific aid.
Starch potatoes	Part of direct payment included in SFP, remainder is crop-specific payment.
Nuts income payment	Fixed flat-rate payment based on fixed acreage.
Protein crops	Protein crop supplement (increase in payment to encourage protein crop production) preserved.
Set-aside payment	Included in SFP.
Carbon credit for energy crops	Aid of 45 euro/hectare for energy crops, up to maximum of 1.5 million hectares.
Dried fodder income payment	Single farm payment paid to growers plus support to industry through direct payment.
Cotton	Minimum of 65 percent decoupled payment with 22 million euros provided for transition to other uses. Begins in 2006.
Olive oil and olives	Minimum of 60 percent decoupled payment and 4-year reference period (2000-03) of which 3 are chosen for payment reference period. No trees count if planted after May 1, 1998. Begins in 2006.
Tobacco	Minimum of 40 percent decoupled to be phased in from 2006-09. In 2010, 50 percent of aid in SFP with remainder in restructuring fund. Begins in 2006.
Hops	Minimum of 75 percent of aid decoupled. Begins in 2005.
Livestock	
Beef	Beef payments converted to SFP. Member states may opt to retain some payments, in full or in part, as coupled to beef production.
Ewe/goat premium	Included in SFP; member states may opt to retain up to 50 percent coupled to production.
Dairy	Reduced intervention prices for butter (-25 percent), skim milk powder (-15 percent). Intervention purchases of butter limited. Dairy income payments plus member state additional payments, 2004-08. Dairy income payments included in SFP after 2008.
General	
Single farm payment	Direct income payment based on historical entitlement replaces payments from arable crops, beef, ewe/goat, and dairy (after 2008) sectors.
Member state payments	Member states may make additional payments to encourage production (quality, environmental) up to 10 percent of national SFP ceilings; amount reduced by amount of retained coupled payments.
Quality incentives	Support for promotion (quality assurance, geographical indication, organic farming).
Support to help farmers meet standards	Support for farm audits, aid to farmers to help implement standards in areas of environment, food safety, animal welfare, and occupational safety.
Support to farmers for improving animal welfare	Support to extent of additional costs involved in improving welfare of farm animals.
Investment support for young farmers	Increased investment aid for young farmers.
Rural development measures	Funds from taxation of large farms ("modulation") to be used to increase spending on rural development measures.

dairy products, sugar, and, at reduced levels, beef and rice. Prices for EU sugar, dairy products, and beef remain well above world levels.

- *Single farm payment.* The EU's current system of direct payments is tied to production of specific products—arable crops (grains and oilseeds) and set-aside payments on an area and yield basis and livestock payments on a per head basis. Single farm payments (SFP) will replace the current direct payments beginning in 2005-07 at the discretion of the member states. As "decoupled payments," SFPs are not tied to current production because they will be based on producers' 2000-02 historical payments and will not require production (see box, "Why Switch to Decoupled Payments?"). Member states will have significant discretion in implementing the SFP. They may choose to retain a portion of current payments as production-linked, within limits set by the EU. They may also choose when to adopt the SFP (2005, 2006, or 2007), whether to vary the degree of decoupling in different regions, and how to allocate the payments among farms. For example, member states may choose to make the single farm payment a flat per hectare payment to all farms in a region or vary the payment by farm based on its historical payments. Member states may "top up" payments by up to 10 percent of the SFP, but for each member state, total payments must not exceed limits established for that country by the European Commission. The net effect may be that the "Common" Agricultural Policy may not be as common among member states as it has been in the past three decades.
- *Cross-compliance and environmental programs.* Though farmers receiving

Why Switch to Decoupled Payments?

Decoupled payments are fixed payments that are not tied to current production activities, inputs, or practices. No production decision or change in market price can alter the size of the payment owed to eligible producers. In contrast, "coupled" subsidies directly affect production decisions by changing the producer's net returns for specific commodities.

Decoupled payments are increasingly being used as a policy tool to support farm income, especially in the United States and the European Union. Use of decoupled payments enables policymakers to address both domestic and international policy goals.

Domestically, decoupled payments reduce variability in budgetary outlays, since the payments are based on fixed factors (like historical production) and the payment rates are generally known in advance. In addition, use of decoupled payments greatly reduces market distortions associated with agricultural support programs. Since decoupled payments are not tied to current production or price, producers are free to base production decisions on market incentives rather than on expectations of government payments.

International commitments to the World Trade Organization (WTO) also create a strong incentive to use decoupled payments. WTO rules limit the use of domestic support ("amber box") programs that encourage farmers to increase production. Currently, WTO rules allow countries to provide unlimited support for so called "green box" policies, such as decoupled payments, that do not encourage farmers to expand production. A special class of payments that limit production and meet specified criteria is also exempted because such payments are considered partially decoupled ("blue box"). Presumably, the current WTO agreement reflects the negotiating countries' assumption that decoupled payments do not distort production decisions and create only minimal incentives to expand production, thus encouraging countries to switch to this type of support because it would reduce trade distortions.

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SFPs are not bound by production requirements, they must adhere to environmental standards and keep the land in "good agricultural condition." SFPs are also contingent on compliance with food safety and animal health and welfare standards. Support will be available to help farmers adapt to these standards.

- *Funding for rural development programs.* Under Agenda 2000, EU member states were allowed to reduce payments for larger farms and redirect the savings to rural development programs. The 2003 CAP reform expands this program, and member states will be required to reduce SFPs for large farms, with most of the savings going toward a rural development fund.
- *Budget measures.* Reforms were motivated in part by concerns about the impact on the EU's agricultural budget of the 10 new members that joined in May 2004, including a few large agricultural producers, such as Poland and Hungary. CAP reform, by fixing payment rates and establishing a financial discipline measure to stay within the CAP budget, alleviates some of these concerns. The CAP budget allows for 1-percent annual increases from 2007 to 2013, and the financial mechanism will reduce the SFP if support outlays threaten to breach this ceiling.
- *Enlargement.* Ten additional countries joined the EU on May 1, 2004: Czech Republic, Poland, Hungary, Slovakia, Slovenia, Estonia, Latvia,

Lithuania, Malta, and Cyprus. For the purposes of the SFP, the treatment of the 10 new member countries will differ from that of the current EU members. Producer payments will be phased in over a 10-year period beginning in 2004, but converted to SFPs in 2005 at 30 percent of the EU-15 level, (although the new members are allowed to top up their SFPs with their own funds by an additional 30 percent of the full payment). Because the new entrants have no history of payments, their SFPs will be based on their average area and yield between 1995 and 1999. During this period, yields in the 10 new member countries were only about half the level for the EU-15; as a result, SFPs for the incoming members will be lower than for EU-15 members. New members will not be subject to payment reductions under the budget discipline mechanism until their payments are fully phased in by 2013.

The policy changes will move the EU further from supporting the market

through commodity price support to supporting producers directly. Decoupled payments will be established as the main policy instrument for supporting EU producers of most commodities, while some coupled support may be retained to prevent land abandonment in marginally productive areas. With support no longer tied to production of these commodities, farmers will have more flexibility as to what they can produce, with the exception of explicitly excluded commodities—mainly fruits and vegetables. Also, the new policy will provide EU members with greater discretion over the timing and method of policy implementation, thus returning a certain degree of national control of agricultural policy to the members.

Production and Trade Impacts Likely To Be Small

The effects of CAP reform on global markets will depend on the impacts on domestic production and consumption. Overall effects on EU production and consumption from CAP reform are likely to be small because support price cuts are limit-

ed to a handful of commodities. Rye, rice, butter, and skim milk powder are likely to be affected the most because the reform cuts support prices for these products, but other crops will be affected indirectly because of a reallocation of resources. For example, barley production is expected to increase as rye production becomes less profitable following the elimination of price support. Beef production is likely to decline by more than arable crop production because the SFP replaces beef payments that were tied to herd numbers. Arable crop producers already had considerable flexibility under the old system—they were able to switch among certain crops or leave the land idle. EU milk production is likely to remain constrained by production quotas, but lower support prices should increase consumption of dairy products, reduce production and exports of butter and skim milk powder, and increase cheese production.

The effects of reforms on production will also depend on the degree of decoupling of support payments chosen by member states. Arable crop payments will



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be decoupled by a minimum of 75 percent, but the percentage of decoupling for livestock payments will be smaller. If members opt to retain production-linked support to the maximum extent allowed, production changes will be smaller. Marginal land operations, which are most likely to be affected by the reforms, are the least productive, and their retirement will thus have minor effects on total production. However, the land must be kept in good agricultural condition and may not be sold for development purposes. This requirement strongly suggests that the land will not exit agriculture, thus creating a minor incentive for production despite the decoupled nature of the SFPs. Decoupling may lead to efficiency gains as subsidy reductions spur resource allocation that could contribute, in the longer term, to structural change.

Any decline in EU production in response to the decoupling of payments would reduce exports and increase imports. While the direct and indirect effects of CAP reform on EU production will likely be small relative to the EU market, the effects on world prices could be larger because EU exports of some commodities account for a significant share of the world market.

Because intervention price support continues, the EU is likely to continue to require subsidies to export beef and dairy products, and depending on exchange rates and world prices, possibly grains as well. Export subsidies will also be required for high-support products not affected by the policy changes. The recent appreciation of the euro relative to the U.S. dollar has increased the likelihood that export subsidies will be needed to export many EU food and agricultural products. However, lower support prices will facilitate reductions in (per unit) export subsidies for selected commodities.

Production effects will differ in the 10 entrant countries because they are not

currently receiving support prices or payments. For some products, like beef, the production effects of higher support prices are likely to outweigh any impact from decoupling of payments. Without reform of rye support, accession to the EU would have brought large increases in rye output, particularly in Poland, where rye is an important crop. With the elimination of support for rye, the Eastern European countries will likely increase barley production to replace rye.

WTO Impacts More Dramatic

The policy reforms are likely to have a greater impact on world trade (and the EU's position in WTO negotiations on agriculture) than on EU production or consumption. The CAP policy changes will affect the treatment of EU support programs under the WTO's current rules on agricultural domestic support. The WTO Agreement on Agriculture accords domestic support programs different treatment depending on the extent to which they are coupled or decoupled from production decisions. Under the current CAP, many EU payments to farmers meet WTO blue box criteria and are exempt from reductions (see box, "Why Switch to Decoupled

Payments?"). Most of these payments will be converted to the single farm payment, which will be based on a producer's historical payments, rather than tied to production of a specific product. The EU is expected to report these payments to the WTO as green box payments.

This payment conversion in the latest CAP reform is very timely for the EU. In the agricultural negotiations in the current Doha Round, changes in domestic support policies have been proposed, including limits or reductions to blue box support. By moving a considerable portion of EU producer support from blue box to green box, the EU may exempt this support from possible WTO disciplines.

CAP reform would allow the EU to accept further disciplines on domestic support, but does not address market access at all, and will have only marginal effects on export subsidies. Reducing support prices for rye, rice, and milk would result in some further reductions in coupled ("amber box") support. However, import barriers remain unchanged under the new CAP provisions, and export subsidies would be reduced only in response to limited support price reductions and lower export levels.



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Additional Policy Reforms Agreed on Mediterranean Crops

In April 2004, the European Commission adopted reforms of the support regimes for tobacco, olive oil and olives, cotton, and hops. The reforms follow the principles established in the June 2003 CAP reform but differ in the details: a significant part of current production-linked support will be converted to the decoupled SFP, although a portion of support can be retained as production-linked aid for producers with small holdings or in marginal areas. These new reforms will begin in 2006 for all but hops, which begins in 2005. On July 14, 2004, the EU Commission proposed a reform of the sugar sector, calling for lower support prices, decoupled payments, and a reduction of the production quota. Final agreement is not expected until 2005. Reforms in these sectors, if implemented as envisioned, would shift EU domestic support from the amber box to the green box, rather than the blue box, and help the EU to meet additional commitments to reduce domestic support that might result from the ongoing WTO negotiations on agriculture.

Conclusions

Will the latest CAP reform further enhance the EU's competitiveness in agricultural trade? Severing the link between producer payments and production of specific products will give EU producers greater flexibility, within limits, to produce those goods best suited for production and market conditions. Further cuts in support prices, along with the delinking of payments from production, represent a move toward greater market orientation that could improve competitiveness. Some marginal land is likely to go out of production, leading to some decrease in production and exports, and thus increase world



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prices. However, prices of most EU agricultural products are still supported above world prices through government purchases, storage aid, or import barriers, and continue to interfere with market signals. The increases in EU exports and share of world exports, to the extent that they have been aided by high support prices, export subsidies, and production of surpluses, could be reversed by the move toward increased market orientation.

The member states themselves may be the wild card in this latest CAP reform. The path of reform selected by each member state could have consequences for production, efficiency, land prices, and other factors with the potential to affect trade. Member states may even decide that the costs of administering national programs are prohibitive and revert to the default EU policy, which would essentially decouple all payments. Much remains to be decided in the EU over the next 3 years before the full impact of this potentially very complex reform of EU farm policy can be fully evaluated. \mathcal{W}

This article is drawn from . . .

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Sharing the Economic Burden

Who Pays for WIC's Infant Formula?

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Proper nutrition during an infant's first year is essential for long-term growth and development. Although breastfeeding is the best nutritional method of feeding most babies, not all mothers breastfeed their infants. For these infants, infant formula is a key, or even sole, source of nutrition during their first months of life. Each month, USDA's Special Supplemental Nutrition Program for Women, Infants, and Children, commonly known as WIC, provides infant formula at no cost to almost 2 million nutritionally at-risk infants in low-income households. In fact, over half of all infant formula sold in the United States is obtained through WIC. But while WIC's infant formula is free to WIC participants, "there's no such thing as a free lunch." Infant formula is no exception to this elementary lesson of economics.

As with other Federal programs, WIC is funded by the U.S. Treasury. Taxpayers alone, however, do not bear the full economic burden of WIC. Infant formula man-

Over half of all infant formula sold in the United States is obtained through WIC.

ufacturers provide the State agencies administering the WIC program with rebates of 85 to 98 percent of the wholesale price for each can of formula purchased by WIC participants. These rebates totaled \$1.48 billion in fiscal 2002 and supported over a fourth of WIC's participants.

A recent ERS study of infant formula prices in 47 local areas found that non-WIC households who pay for infant formula out of their own pockets share some of the economic burden as well. The study found that an indirect effect of the program is slightly higher infant formula prices in supermarkets. For example, depending on the brand, feeding an average 3-month-old girl costs between \$78 and \$92 per month, but monthly costs increase anywhere from \$0.32 to \$5.26 if the girl's family lives in an area where WIC participation is signifi-

cantly higher than the national average. The ERS study focused on retail pricing behavior by supermarkets, setting aside wholesale pricing behavior by infant formula manufacturers.

WIC Serves Almost Half of U.S. Infants

WIC is one of the central components of the Nation's nutrition assistance system. About half of all infants, a quarter of all children ages 1-4, and a third of all pregnant women participate. Federal program costs were \$4.5 billion in fiscal 2003, making WIC the country's third-largest nutrition assistance program, behind the Food Stamp Program (\$23.9 billion) and the National School Lunch Program (\$7.2 billion) (see box, "WIC Facts").

As a supplemental nutrition assistance program, WIC provides vouchers for specific foods that supply target nutrients—specifically protein, iron, vitamins A and C, and calcium—identified as lacking in the diets of low-income pregnant, breastfeeding, and postpartum women and their infants and young children. WIC-approved food categories include milk, eggs, cheese, cereal (hot and cold), infant cereal, juice, peanut butter, dried beans or peas, canned tuna, carrots, and infant formula. WIC infants receive up to thirty-one 13-ounce cans of liquid formula (or its equivalent) per month—an amount that accounts for most infants' formula needs.

Participants exchange the vouchers for WIC-approved foods at authorized retail outlets, such as supermarkets, small grocery stores, and pharmacies. Retailers submit the vouchers to their bank, which in turn submits them to the WIC State agency to be reimbursed the retail or shelf price of the WIC items.

WIC State agencies award sole-source contracts to the infant formula manufacturer offering the lowest net price—wholesale price less the manufacturer's rebate.

Curtia Taylor, USDA/ERS





Ken Hammond, USDA

WIC Facts

The mission of the WIC program is to safeguard the health of low-income women, infants, and children up to age 5 who are at nutritional risk, by providing supplemental foods, nutrition education, and referrals to health care and other social services. WIC is based on the premise that early intervention programs during critical times of growth and development can help prevent future medical and developmental problems. Administered by USDA's Food and Nutrition Service, the program provides grants for supplemental foods, nutrition services, and administration to 88 WIC State agencies, including the 50 States, the District of Columbia, Guam, the U.S. Virgin Islands, American Samoa, the Commonwealth of Puerto Rico, and 33 Indian Tribal Organizations.

To qualify for WIC, a family's income must be at or below 185 percent of the Poverty Income Guidelines (\$34,040 for a family of four in June 2004). Applicants who participate or who have certain family members who participate in the Food Stamp, Medicaid, or Temporary Assistance for Needy Families (TANF) programs are deemed to meet the income eligibility criteria automatically. Applicants must also be nutritionally at risk, as determined by a health professional.

Formula Manufacturers Offer Big Rebates

WIC was established in the early 1970s. By the mid-1980s, infant formula was accounting for an increasingly large share of total WIC food costs. In an effort to control costs, several States implemented rebate programs with manufac-

turers of infant formula. As a result of the cost savings from these rebate programs, a Federal law was passed in 1989 requiring WIC State agencies to develop

cost-containment systems for the procurement of infant formula.

Most WIC State agencies obtain discounts in the form of manufacturers' rebates for each can of formula that WIC participants "purchase" (by exchanging vouchers). In return for the rebates, a formula manufacturer receives an exclusive sales arrangement within the State. That is, WIC participants in the State are given vouchers that can be redeemed only for that brand of formula, making that manufacturer the sole supplier to the WIC market in the State. Each State's WIC contract is awarded to the manufacturer that bids the lowest net price—wholesale price less the rebate. Thus, the brand of infant formula purchased by WIC participants (the contract brand) can vary from State to State. The State WIC agency bills the contract-winning manufacturer for the rebate specified in the contract. The rebates' effect on WIC program cost is substantial. In fiscal 2002, it is estimated that infant formula accounted for about 46 percent of total WIC food costs on a pre-rebate basis but only 21 percent on a post-rebate basis.

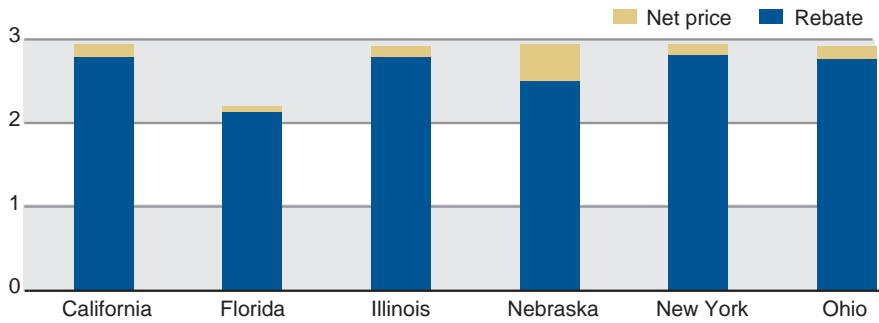
Rebates per can of formula also vary across States and ranged from 85 to 98 percent of the manufacturer's wholesale price in fiscal 2000. As a result, the highest net price a manufacturer received for WIC-provided infant formula was only 15 percent of the wholesale price. Net prices in September 2000 ranged from 6.5 cents (per can of milk-based liquid concentrate) in Florida to 44.7 cents in Nebraska and South Dakota. For the U.S. as a whole, net prices averaged 18 cents per can in fiscal 2000.

Both supply-side and demand-side characteristics of the infant formula market help to explain how WIC State agencies can receive such large rebates. On the supply side, the formula market is highly concen-

To qualify for WIC, a family's income must be at or below 185 percent of the Poverty Income Guidelines.

Infant formula rebates are large

Dollars per can of 13-oz milk-based liquid concentrate (Sept. 2000)



trated: in 2000, three companies—Mead Johnson (52 percent), Ross (35 percent), and Carnation (12 percent)—accounted for 99 percent of the infant formula market. A high degree of concentration is often associated with high profit margins, which, in turn, give manufacturers the cushion to offer high rebates. On the demand side, WIC participants purchase over half of all

infant formula, assuring large sales for the contract-winning manufacturer. In addition, manufacturers can realize spillover benefits of winning a WIC contract: retailers may devote increased shelf space to the WIC contract brand, which may then lead to increased sales of the brand to non-WIC participants. Sales may also rise if physicians recommend the WIC contract brand

to non-WIC mothers. While manufacturers would prefer a higher net price, stipulating a higher net price in a contract bid could jeopardize a formula maker’s chances of winning the contract. Ongoing ERS research is examining factors that affect net formula prices across States.

WIC Raises Infant Formula Prices Slightly

Each of the three major formula manufacturers sets a national wholesale price schedule for retailers, with price based on the size of the purchase. Thus, wholesale prices for a given brand and amount of formula do not vary by geographic area. Any differences in a brand’s retail prices across major market areas are determined primarily by variation in the retail markup—the difference between the retail price and the wholesale price. Retail prices for a particular brand of infant formula vary significantly across the country. For example, the average retail price of a can of Mead Johnson’s Enfamil milk-based liquid concentrate was \$2.56 in supermarkets in Albany, NY, in 2000. In San Diego, CA, the same product sold for \$3.59. In addition, in any local market, different manufacturers’ brands of formula sell for different prices. Notably, Carnation brand formula typically sold for less than the brands of Ross and Mead Johnson in 2000, due in part to Carnation’s lower wholesale price.

WIC can be thought of as creating two separate markets for infant formula: the WIC market and the non-WIC market. WIC households obtain formula at no cost and are therefore price insensitive, while non-WIC households must pay for the infant formula they purchase and are relatively price sensitive. Federal regulations prohibit retailers from charging WIC participants more than non-WIC customers. However, in local areas where WIC households make up a large share of the area’s formula-buying households, retailers have an incentive to increase the price for the WIC contract

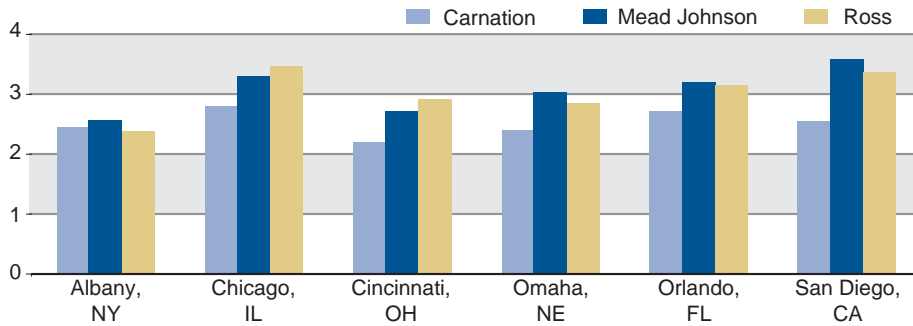
An indirect effect of the WIC program is higher retail prices for non-WIC consumers of infant formula.



Curtia Taylor, USDA/ERS

The average retail price of milk-based liquid concentrate infant formula varies widely across market areas

Dollars per 26-oz reconstituted (Sept. 2000)



brand of formula. Retailers will then receive a higher reimbursement when the WIC vouchers are submitted to the WIC State agencies. (WIC State agencies have the authority to limit the price that WIC-authorized vendors can charge for the WIC contract brand of formula, thus discouraging retailers from charging exorbitant prices for infant formula.)

An ERS analysis of 47 local areas found that WIC and its infant formula rebate program do affect the retail price of formula. Controlling for other factors—such as wholesale price and household income—a manufacturer’s brand of formula was priced higher if it was the WIC contract brand in an area. For a dozen types of infant formula examined, prices increased up to 6 cents (per 26 ounces reconstituted) for the contract brands.

WIC’s relative size in a local area, as measured by the ratio of WIC to non-WIC formula-fed infants, affected retail prices of contract brands as expected. And, in areas where the relative size of WIC is large, retailers have an incentive to raise the price of noncontract brands of formula as well. Once retailers establish a higher price for the contract brand, some non-WIC households may choose to switch to the noncontract brand, resulting in an increase in demand for the noncontract brand. However, retailers have more incentive to increase the prices of WIC contract brands, as WIC households will

not change their purchasing behavior if contract-brand prices rise.

What is the impact of these price effects on the monthly budget of a non-WIC family? The formula needs of infants vary. Parents of a 3-month-old girl typically spend between \$78 and \$92 per month (in 2000 dollars) for milk-based powder formula, depending on brand. If this family moved from an area where half of all formula-fed infants are in WIC to an area where two-thirds are in WIC, their monthly expenditures for infant formula bought



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Rebates from infant formula manufacturers totaled \$1.48 billion in fiscal 2002, supporting over a fourth of WIC’s participants.



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WIC and Breastfeeding Rates

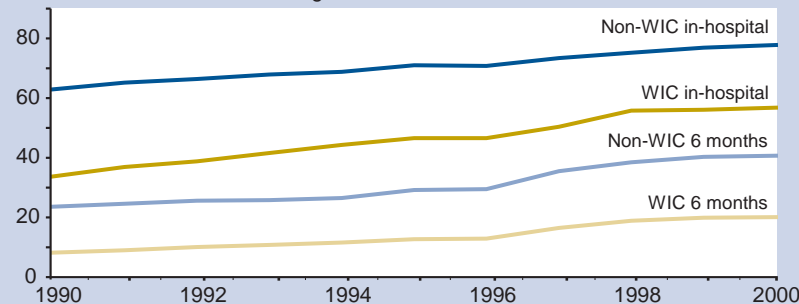
WIC officials recognize the numerous health benefits of breastfeeding. WIC, through its nutrition education and breastfeeding promotion programs, encourages mothers to breastfeed their infants. Breastfeeding women get higher priority for certification into the program than nonbreastfeeding postpartum women, and they are eligible to participate in WIC longer than nonbreastfeeding mothers. Mothers who exclusively breastfeed their

infants receive vouchers for more foods and larger quantities for some authorized foods than nonbreastfeeding postpartum women. Breastfeeding mothers can also receive breast pumps and other breastfeeding aids to help support the initiation and continuation of breastfeeding.

Although breastfeeding rates are increasing among women participating in WIC—both while in the hospital immediately after giving birth, and 6 months after giving birth—the rates continue to be lower than those of non-WIC women. Although some have questioned whether WIC provides a disincentive to breastfeeding by supplying free infant formula, the women most likely to participate in WIC, including mothers who are poor and have low education levels, are less likely to breastfeed their children in general.

Breastfeeding rates of WIC infants continue to increase

Percent of children breastfeeding



Source: Ross Mothers Survey.

in supermarkets would typically increase. For milk-based formula, the most popular type, expenditure increases ranged from \$2.87 to \$5.26 per month for contract brands and from \$0.32 to \$4.52 per month for noncontract brands.

Who Pays?

WIC and its infant formula rebate program have been successful in terms of making infant formula available to needy infants at a low monetary cost. With rebates from the formula manufacturers, the cost of the formula to taxpayers is a small fraction of its wholesale price. However, an indirect effect of the program is higher retail prices for non-WIC consumers of infant formula. WIC and its infant formula rebate program each affect the supermarket price of infant

formula, although the estimated impact on a non-WIC family's monthly expenditures for infant formula is modest. Balancing these modest price effects is the fact that rebates support over one of every four participants in the WIC program, or almost 2 million low-income people per month in fiscal 2003.

WIC is working to increase breastfeeding rates among WIC mothers (see box, "WIC and Breastfeeding Rates"). If successful, these efforts could decrease the ratio of WIC to non-WIC formula-fed infants. With price-insensitive WIC participants making up a smaller component of the infant formula market, WIC's influence in the retail infant formula market will be lessened, resulting in lower retail prices for both contract and

noncontract brands of infant formula for non-WIC consumers. \mathcal{W}

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National Obesity Prevention Conference

Sponsored by the United States Department of Agriculture
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Obesity in America is a national human health crisis. The USDA, together with its partners, will address this important public health concern at a conference in October. The conference will draw from many different disciplines to examine obesity—from its cause to its prevention. The conference will be science-based, but will have a practical orientation to help develop strategies to prevent obesity and lead to behavioral changes for a healthier U.S.

The conference will begin with an introductory session on the first evening, followed by three plenary working sessions over one and a half days. A small group will prepare a summary report and recommendations. The working sessions will be dialogue-oriented, enabling participants to share ideas and insights from current research, and provide new ideas for future research and action. Conference sessions include:

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Fifty Years of U.S. Food Aid and Its Role in Reducing World Hunger

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In 1996, the World Food Summit set its sights on reducing by half the number of hungry people in the world by 2015. But 8 years after the signing of this declaration, the international community is coming to grips with the fact that it will fall far short of its goal. All indicators developed by ERS lead to the inescapable conclusion that the aggregate food security situation—measured by food availability of many low-income countries—has hardly improved at all in the last decade. Reports from the Food and Agriculture Organization (FAO) of the United Nations tell the same story.

Among the reasons for chronic undernutrition in the poorest countries are slow growth in domestic food production, high population growth, inadequate purchasing power, and frequent setbacks associated with natural and manmade shocks, such as drought, hurricanes, and civil strife. To counter the trend, the ultimate goal is to reduce the impacts of shocks, which reduce food production and consume too many resources in countries with too few to spare. Until that long-term goal can be met, it is critical to strengthen the food safety net in the most vulnerable countries. Because most poor countries do not have national food safety net programs, they depend on international food aid. But food aid increasingly falls short of needs: quantities change annually, and overall levels have grown only minimally during the life of the programs. The uncertain availability of food aid, though worrisome, is just one reason why food aid has not played a larger role in reducing world hunger. Differing objectives in food aid

programs, lack of consistency among donors' approaches to food aid, and types of food donated are just a few factors that limit the effectiveness (the degree to which it reduces a country's food gaps) of food aid.

Future of Food Aid Programs Is Uncertain

The global quantity of food aid has fluctuated during the last two decades, and its share has declined relative to both total agricultural exports from food aid suppliers and total food imports of low-income countries. The virtual stagnation in the level of food aid over time is not likely to change, and it may even decline if budgets remain tight. As major donor nations reduce market support to agriculture due to budget constraints as well as to comply with their commitments to the World Trade Organization, decreases in surplus food production will likely follow. The costs of food aid may increase as a result.

As the trend in supplies of food aid has remained relatively flat, the gap between food production and food consumption in low-income countries, and thus the demand for food aid, has widened. According to ERS, the gap between recommended nutritional requirements and purchasing power of the populations in the world's poorest countries was more than 32 million tons in 2003, about four times larger than the supply of food aid in 2002. While this gap is projected to narrow to less than 28 million tons during the next decade, it will likely remain far above the level of available food aid, which may decline.

According to the World Bank, about 1 billion people in developing countries live in poverty with annual per capita incomes of less than \$370. In some regions, particularly Sub-Saharan Africa, per capita food consumption has declined in the last two decades, but food aid supplies have not changed since the late 1980s. For these countries, further declines in food consumption from already low levels can lead to severe food shortages, malnutrition, and political instability.

These estimates, however, do not necessarily mean that significant increases in food aid would be able to close these gaps. Given the poor distribution systems in these countries, absorption of large quantities of food imports would be difficult, if not impossible. Nevertheless, targeting efforts in the distribution of food aid need to be improved in order to increase its effectiveness and reduce hunger. There are growing and unresolved questions related to the impacts and the role of food aid. Despite 50 years of food donations, food aid's role in reducing world hunger remains unclear. (See box, "The Evolution of the 50-Year U.S Initiative.")

How Effective Is Food Aid in Improving Food Consumption?

There are three types of food aid, each with a differing objective. *Program food aid* is a government-to-government donation that aims to reduce food import costs for the recipient country. *Project food aid* is used by a government or non-government organization to provide support for development projects. *Emergency food aid* is used to augment food supplies or assist in rebuilding productive assets for countries affected by political or natural disasters.

The different uses of food aid have generated debates on the positive (additional food supplies) and negative (production disincentive due to the decline in local prices) effects of the programs. Still,

food aid is regarded as a valuable resource for increasing food consumption by providing temporary relief from food shortages. But has food aid reduced consumption instability over time? Since the quantities of food aid fall short of the aggregate needs of the study countries, the next question is whether food aid is provided to those who need it the most.

Food aid clearly had a significant role in reducing the loss of life . . .

What does food aid contribute to consumption? The overall contribution of food aid to total food consumption in the 70 countries included in ERS's annual *Food Security Assessment* is small, but the importance of food aid is more pronounced when it is measured at the country level at particular points in time. The 70 countries covered in this exercise include 4 in North Africa, 37 in Sub-Saharan Africa, 10 in Asia, 11 in Latin America and the Caribbean, and 8 in the Commonwealth of Independent States (CIS). Food aid, on average, provided less than 4 percent of food consumption (grain equivalent) for the 70 countries in the last decade, but the share varied greatly by country and tended to be more significant during emergencies.

- During Somalia's 1992-93 civil war, food aid contributed to about 70 percent of its consumption.
- When Mozambique was faced with prolonged economic and political difficulties (early 1980s through early 1990s), it often relied on food aid to supplement more than a third of its food consumption.



FAO/ M. Griffin

- In Rwanda during 1997-99, food aid contributed to more than a third of food consumption.
- Since 2000, Eritrea has relied on food aid for about half of its consumption.
- During 2000-02, the largest recipients of food aid were North Korea (4.2 million tons total for the 3 years), Ethiopia (4.0 million tons), Bangladesh (1.4 million tons), and Afghanistan (1.1 million tons). In North Korea, food aid contributed to about 20 percent of food consumption. In Ethiopia and Bangladesh, food aid's contribution to consumption was less than 10 percent.

Has food aid stabilized consumption?

Food aid clearly had a significant role in reducing the loss of life during food emergencies in such countries as Ethiopia, Sudan, Somalia, Afghanistan, Rwanda, and Haiti. However, over time and at the aggregate level, the impact was less apparent. Based on food consumption data (grain only) in 62 low-income countries, the annual consumption shortfalls from trend in each country (excluding food aid) during 1981-99 exceeded the cumulative quantity of food aid received over the same period by 8 percent. Ideally, the volume of food aid would have matched the consumption shortfalls. In practice, however, food aid followed a declining trend while consumption shortfalls varied annually: in 5 of the 19 years, aggregate food aid exceeded the consumption shortfalls; in 12 of the years, it was less than the shortfalls; and in only 2 years (1986 and 1992) did the quantities

The Evolution of the 50-Year U.S Initiative

The U.S. food aid program began in the early 1950s with the enactment of the Agricultural Trade Development and Assistance Act of 1954 (P.L. 480). The program's objectives include the provision of humanitarian assistance and the support of economic development (project aid) in recipient countries. These objectives are carried out under three broad programs:

- Title I consists of government-to-government commodity sales and sales to private entities in developing countries under long-term, low-interest credit arrangements.
- Title II provides food as a grant for emergency relief and economic development projects.
- Title III provides for government-to-government grants to support economic development in the least developed countries (1977 amendment); this program has not received funding since 2001.

The goals of food aid have changed through time, and the importance of food aid as an export outlet has diminished substantially. For example, during the early 1970s, as commercial demand for grains increased dramatically, fewer commodities were available for food aid, and donations fell to their lowest level since the enactment of P.L. 480. During the mid-1980s, increased U.S. grain stocks did not translate into increased food aid because the U.S. Government adopted a targeted export subsidy program that boosted agricultural exports. With the decline in food aid as a share of exports, the U.S. food aid program has become more focused toward humanitarian goals. In 1991, for the first time since the start of U.S. food aid programs, the largest share of the P.L. 480 budget was allocated to Title II to support humanitarian concerns. Between 2001 and 2003, Title II received 85 percent, on average, of the P.L. 480 budget.

Other food aid programs include:

- Food for Progress, which provides for the donation or credit sale of U.S. commodities to developing countries and emerging democracies,
- Section 416(b) of the Agricultural Act of 1949, which provides for overseas donations of surplus commodities acquired by the Commodity Credit Corporation, and
- McGovern-Dole International Food for Education and Child Nutrition, which helps support education, child development, and food security for some of the world's poorest children.

match. The comparisons are much more uneven at the country level.

Does food aid respond to needs? The effectiveness of food aid depends on whether it is provided to those who need it most. *Distribution food gaps*, as estimated by ERS (see "Behind the Data," page 45), reflect the amount of food needed to raise consumption of all income groups within a country to the nutritional requirement. This measure captures the differences in purchasing power within a country. *Food aid effectiveness* is measured on a scale of 0 to 100 percent, with 0 percent reflecting food aid given to a country with no needs and 100 percent reflecting food aid that reduces a country's food gap by its full amount. This method measures actual consumption as related to purchasing power within the countries at the national level

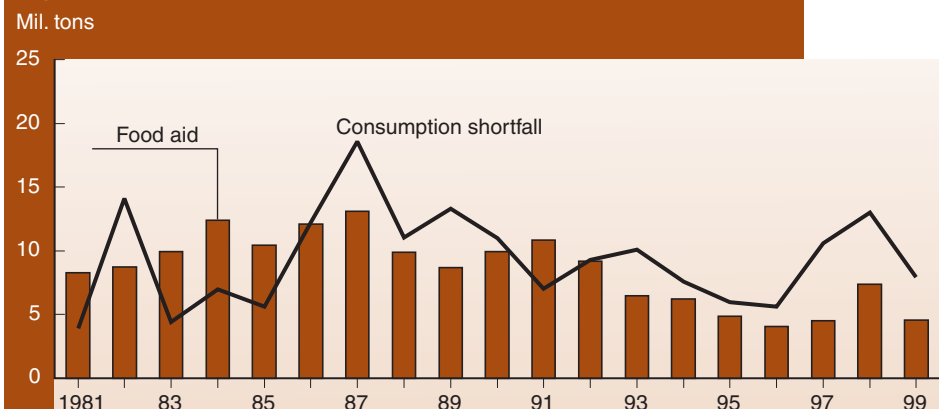
and may not capture micro-level specific programs, such as food for work, which could be location specific.

During 1991-2000, the average effectiveness of food aid was 66 percent, meaning two-thirds of food aid went toward

reducing and/or eliminating the recipient countries' food gaps. The remaining 34 percent went to countries that either did not have food needs or that had needs less than the amount of food actually received. Regionally, food aid deliveries in Sub-Saharan Africa and Latin America were highly effective in reducing food gaps, averaging about 80 percent, compared with 40-46 percent in Asia and the CIS.

The effectiveness of food aid in meeting nutritional needs depends highly on how food aid is allocated and what criteria are used to make allocation decisions. The largest nutritional gain is realized when food aid is targeted to the lowest income group—thus indirectly increasing this group's purchasing power—either in emergency situations or in support of supplementary feeding programs, such as food stamps. In these cases, food aid changes a country's income distribution indirectly because it allows the lower income group to consume more than expected given its income level. In 2000, about half of food aid was used for emergencies, which can be categorized as targeted. It is not clear how much of the other half was targeted—the effectiveness of other uses of food aid in reducing hunger is difficult to estimate. All food aid reduces food costs in the market, making food more affordable; but without targeting to the most vulnerable group, the ben-

In 62 low-income countries, consumption shortfalls vary from year to year while food aid declines





efits of food aid tend to be distributed across the entire population of a country.

What Prevents the Program From Achieving Its Full Potential?

There are many unresolved issues relating to food aid. After 50 years, there are neither uniform approaches nor transparent criteria among donors regarding decisions to allocate food aid. Program eligibility criteria are loosely defined, and it is not always clear when an activity stops, and why. Many countries receive food aid for reasons that are not clear. For example, China received wheat in 2000-02 as food aid to finance development projects, but, in turn, donated food (wheat, rice, corn, oils) to North Korea and several African countries during the same period. In addition, it is not clear what governs donor decisions to shift from the use of food aid for development purposes to emergency relief (or vice versa) both within a country and across countries. Such changes have implications (positive or negative) on the coordination and management of food aid between donors and recipients. In each case, it is difficult to measure which potential goals are met (cost effectiveness, meeting recipient needs) and to what extent. Compounding the problem are the changes in annual availability of

food aid stemming from donors' political and budgetary considerations. It is an open question whether a program with this type of characteristic can provide a reliable food safety net, let alone a reliable source of development.

The United States plays a pivotal role within the international food aid system . . .

Another issue of concern is the producer disincentive impact of food aid when it is sold for development activities. In such cases, food aid results in lower producer prices, which reduces incentives to produce, thereby creating a growing dependency on food aid. The selection of commodities used for food aid is also raising questions. The growing share of non-cereal food aid products, such as vegetable oil, pasta, dried potatoes, dried fish, pulses, sugar, and fresh vegetables, is potentially worrisome. As recently as the early 1990s, these products accounted for only 9 percent of total food aid donations; 10 years later, the share had jumped to more

than 14 percent. This is problematic because these commodities are higher priced than cereals and, therefore, are not likely to reach the poorest segment of the population. In some cases, these commodities now account for a larger share of the food aid package than cereals. For example, in 2000, noncereals accounted for two-thirds of Georgia's food aid receipts (67,739 tons in grain equivalent). (See box, "Who Are the Major Food Aid Donors and Where Does the Aid Go?")

Toward Improving Effectiveness of Food Aid

The goal of the World Food Summit was to halve global hunger in a little over a decade. Each and every signatory country bears the responsibility of meeting this goal, but short-term economic and political shocks around the world remain serious obstacles. The United States plays a pivotal role within the international food aid system, and its actions have a profound effect on the actions of other donors and the system as a whole. The 50th anniversary of the U.S. food aid program in 2004 is a timely point to appraise the program and reexamine plans for the future. The U.S. Action Plan on Food Security, released in March 1999, outlines policies and actions aimed at alleviating hunger at home and abroad. To improve the effectiveness of the international food assistance program, the action plan made aid to the most food-insecure countries a priority. It is too early to evaluate the impacts of this policy change, but steps are being taken by the U.S. Government to develop transparent methods to monitor the effectiveness of food aid in reducing hunger in recipient countries.

Lessons from the past could be useful toward improving the effectiveness of food aid. For example, emergency food aid has saved lives (response to drought in Ethiopia, 1984-85, 1991, 1999-2000, and Zambia, 1992; response to civil strife in

Who Are the Major Food Aid Donors and Where Does the Aid Go?

The major food aid donors are the United States, European Union (EU), Japan, Canada, and Australia. In the late 1980s, the U.S. provided roughly 7 million tons of food aid per year, or nearly 60 percent of global food aid donations during the period. The EU share at that time was about 25 percent. U.S. donations fell considerably from the late 1980s through the mid-1990s, and the U.S. share of world food aid slipped below 50 percent in 1994-96. This decline was offset by the EU, whose share rose to 35 percent, and Japan, whose share jumped from less than 4 to nearly 6 percent. U.S. donations have rebounded considerably, however, and since 2000, the U.S. share of world food aid has surpassed levels of the late 1980s. Conversely, EU donations have slipped, with the EU share averaging less than 20 percent in recent years.

Countries in Sub-Saharan Africa (SSA) and Asia have been by far the largest recipients of food aid, receiving more than 60 percent of the volume of food aid during the last 15 years. The food aid share of the two regions has changed over time, depending on the economic and political developments in their respective countries. Severe droughts in the early 1990s resulted in higher food aid shipments to SSA, while political, financial, and natural disasters in the late 1990s triggered a shift in donations to Asia. On a per capita basis, however, food aid receipts are much higher in SSA than in Asia because of differences in population: SSA countries have less than half of the population of lower income Asian countries.



WFP/Mike Huggins

Donors' shares of global food aid

	U.S.	EU	Japan	Canada
	<i>Percent</i>			
1988	58.1	22.5	3.6	8.6
1989	56.6	27.2	3.9	6.7
1990	59.7	24.6	3.6	7.2
1991	58.1	25.4	3.3	7.3
1992	49.7	35.2	3.0	6.9
1993	63.5	24.4	2.4	3.6
1994	56.1	29.0	2.4	7.1
1995	41.7	39.5	8.7	4.9
1996	44.3	35.5	6.4	5.2
1997	43.3	30.6	4.5	7.3
1998	48.2	22.8	13.7	4.8
1999	63.9	24.3	2.9	2.7
2000	61.5	18.9	4.8	2.7
2001	59.0	18.8	8.8	2.6
2002	64.9	13.8	3.2	1.7
1988-89	57.4	24.8	3.8	7.6
1994-96	47.3	34.7	5.8	5.8
2000-02	61.8	17.2	5.6	2.4

Somalia, 1991-92, and Rwanda, mid-late 1990s; response to Hurricane Mitch in Honduras in 1998-99; response to financial crisis in Indonesia in 1998). Food aid has also proved effective in post-emergency situations.

Other uses of food aid, however, have had mixed results, particularly program food aid, that is, government-to-government donations that are commonly sold in recipient country markets. Program food aid is a resource transfer and is often used to reduce financial constraints of recipient countries. Therefore, it is not targeted to any specific nutritional or development objectives. Another drawback of program food aid is the potential for interfering with market functions. The most prevalent food aid commodities are cereals and

vegetable oils, commodities most often imported commercially by the recipient. The injection of food aid in this circumstance can disrupt markets and depress producer prices.

There is also evidence that program food aid, in some instances, has created structural import dependency. For example, program food aid has encouraged the development of industries, such as poultry farming or wheat milling, that require imports to continue operations even after the termination of the food aid program.

Overall, the impact of food aid in reducing hunger has fallen short of its potential and, in some cases, has negatively affected the economies of the recipient countries. A more important

problem lies in the fact that there is no coordination among donors to establish guidelines for distribution and need-based targeting of food aid. It is an annual budgetary program, which hinders its flexibility to expand or contract in response to the needs of recipients. However, steps toward transparent goals and criteria for food aid eligibility, length of the program, and type of program could enhance its effectiveness and pave the road to improved coordination among donors. \mathbb{W}

This article is drawn from . . .

Food Security Assessment, by Stacey Rosen and Shahla Shapouri, GFA-15, USDA/ERS, May 2004, available at: www.ers.usda.gov/publications/gfa15/

Data may have been updated since publication. For the most current information, see www.ers.usda.gov/publications/agoutlook/aotables/.

Farm, Rural, and Natural Resources Indicators

	1990	2000	2001	2002	2003	2004	Annual percent change		
							1990-2000	2002-03	2003-04
Cash receipts (\$ billion)	169.5	192.0	199.8	192.9	212.4f	215.0f	1.3	10.1	1.2
Crops	80.3	92.4	93.4	99.5	106.7f	114.3f	1.4	7.2	7.1
Livestock	89.2	99.5	106.4	93.5	105.6f	100.7f	1.1	12.9	-4.6
Direct government payments (\$ billion)	9.3	22.9	20.7	11.0	17.4f	10.3f	9.4	58.2	-40.8
Gross cash income (\$ billion)	186.9	228.6	235.3	219.4	244.9f	240.9f	2.0	11.6	-1.6
Net cash income (\$ billion)	52.7	56.5	59.2	49.1	63.0f	55.9f	0.7	28.3	-11.3
Net value added (\$ billion)	80.8	92.0	94.2	76.9	98.9f	93.0f	1.3	28.6	-6.0
Farm equity (\$ billion)	702.6	1,025.6	1,070.1	1,110.7f	1,160.5f	1,198.1f	3.9	4.5	3.2
Farm debt-asset ratio	16.4	14.8	14.8	14.8f	14.7f	14.6f	-1.0	-0.7	-0.7
Farm household income (\$/farm household)	38,237	61,947	64,117	65,757	67,453f	66,732f	4.9	2.6	-1.1
Farm household income relative to average U.S. household income (%)	103.1	108.6	110.2	113.7	na	na	0.5	na	na
Nonmetro-Metro difference in poverty rate (%)	3.6	2.6	3.1	2.6	na	na	-3.2	na	na
Cropland harvested (million acres)	310	314	311	307	314p	na	0.1	2.3	na
USDA conservation program expenditures (\$ bil.) ¹	3.0	3.4	3.7	3.5q	na	na	1.3	na	na

Food and Fiber Sector Indicators

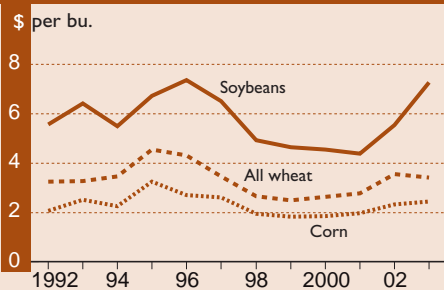
U.S. gross domestic product (\$ billion current) ²	5,803	9,825	10,082	10,446	10,863f	na	5.4	4.0	na
Food and fiber share (%)	15.1	12.6	12.3	na	na	na	-1.8	na	na
Farm sector share (%)	1.4	0.8	0.8	0.8	na	na	-5.4	na	na
Total agricultural imports (\$ billion) ¹	22.7	38.9	39.0	41.0	45.7	51.5	5.5	11.5	12.7
Total agricultural exports (\$ billion) ¹	40.3	50.7	52.7	53.3	56.2	61.5	2.3	5.4	9.4
Export share of the volume of U.S. agricultural production (%)	27.1	22.8	22.9	22.5	21.1p	na	-1.7	-6.2	na
CPI for food (1982-84=100)	132.4	167.9	173.1	176.2	180.0	186.5f	2.4	2.2	3.6
Share of U.S. disposable income spent on food (%)	11.2	10.1	10.2	10.1	10.1	na	-1.0	0.0	na
Share of total food expenditures for at-home consumption (%)	55.4	53.3	53.9	53.8	53.1	na	-0.4	-1.3	na
Farm-to-retail price spread (1982-84=100)	144.5	210.3	215.4	221.2	na	na	3.8	na	na
Total USDA food and nutrition assistance spending (\$ billion) ¹	24.9	32.6	34.2	38.0	41.8	na	2.7	10.0	na

f = Forecast. p = Preliminary. q = 2002 Administration request. na = Not available.

¹ Based on October-September fiscal years ending with year indicated.

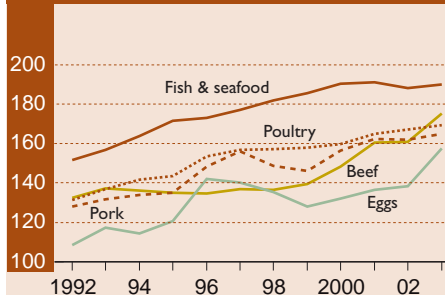
² Forecast for 2003 based on the Office of Management and Budget's Midsession Budget Review, July 2003.

U.S. average prices received by farmers for wheat, corn, and soybean



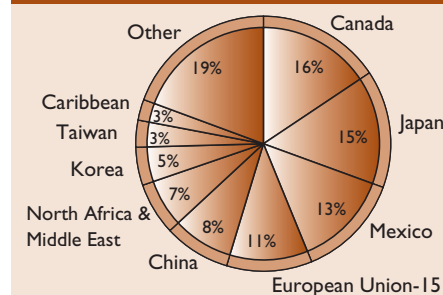
Source: Based on data from *Agricultural Prices*, published monthly by the National Agricultural Statistics Service, USDA.

Consumer price indexes for high-protein foods consumed at home



Source: Based on data provided by the Bureau of Labor Statistics.

Major markets for U.S. agricultural exports totaling \$59.6 billion in 2003



Source: Foreign Agricultural Trade of the U.S.

For more information, see www.ers.usda.gov/amberwaves/

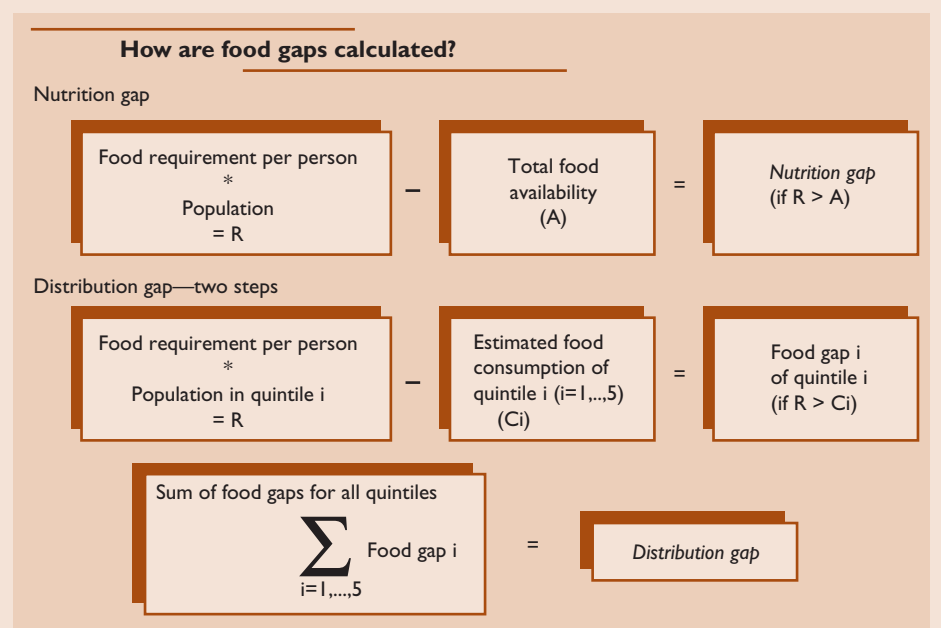
Behind the Data

Estimating Food Access and Food Gaps in Low-Income Countries

ERS contributes to the understanding of global food security, including decisions on how U.S. food aid is allocated, by providing annual estimates of food gaps. Food security, defined as access by all people at all times to enough food for an active and healthy life, requires three conditions to be fulfilled: food must be available, people must have economic access to food, and food must be properly utilized (that is, properly prepared and containing nutrients that can be absorbed by the body). The Food Security Assessment model addresses the first two conditions, as it is used to estimate food availability in order to estimate people's economic access to food. The level of food security of a country is evaluated based on the gap between estimated food supplies and the food required to meet average individual nutritional standards (approximately 2,100 calories per day per person).

The indicators cover 70 low-income developing countries—37 in Sub-Saharan Africa, 4 in North Africa, 11 in Latin America and the Caribbean, 10 in Asia, and 8 in the Commonwealth of Independent States. Total food availability is estimated from separate country models, which include three commodity groups: grains, root crops, and "other." The model structure is based on estimates of the factors affecting in-country food production and imports. Food requirements and food access are based on population projections, a minimum standard for nutritional intake per person, and income levels. The models are updated annually with data from the U.S. Department of Agriculture, the U.N. Food and Agriculture Organization, the World Food Program, and the World Bank.

The gap between food available at the national level and food needed to fulfill all nutritional requirements is called the *nutrition gap*, a food security indicator useful in assessing relative well-being across countries. However, national estimates fail to take into account that food is distributed unevenly among income groups. To capture unequal access to food within the countries,



the ERS Food Security Assessment model estimates a nutrition gap for each income group within a country—the so-called *distribution gap*. Data on food consumption by different income groups within countries are spotty, but national income and consumption data are available. Data from 60 countries of different income levels are used to estimate income elasticities (percentage change in consumption for each 1-percent change in income) of food consumption. Next, these elasticities, along with per capita income and income distribution, are used to estimate food consumption in each income quintile. Where food consumption is less than nutritional requirements, the distribution gap measures the food needed to fill these gaps. The share of population with insufficient access to food is used to estimate the number of people susceptible to undernutrition and hunger.

Each year, ERS publishes food gap estimates for the current year and projections for the next 10 years. The 2003 distribution gap was estimated to be 32.5 million tons, 77 percent larger than the nutrition gap, but it is projected to decline 14 percent over the next 10 years. Sub-Saharan Africa, the region with the largest food gaps, is

Sub-Saharan Africa is expected to have the largest number of hungry people by 2013

	2003	2013
	Million people	
Sub-Saharan Africa	381	490
Asia	440	308
Latin America and the Caribbean	83	36
North Africa	0	19
Commonwealth of Independent States	10	18
Total	913	872

expected to have the highest number of hungry people by 2013, surpassing Asia, which is expected to reduce its number of hungry people.

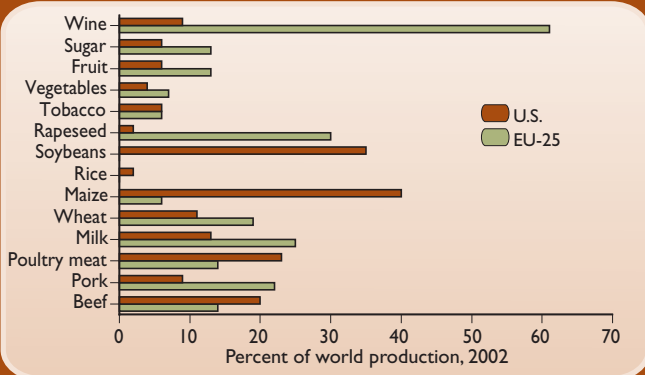
Birgit Meade, bmeade@ers.usda.gov and Stacey Rosen srosen@ers.usda.gov

This article is drawn from...

Food Security Assessment, by Stacey Rosen and Shahla Shapouri, GFA-15, USDA/ERS, May 2004, available at: www.ers.usda.gov/publications/gfa15/

Markets and Trade

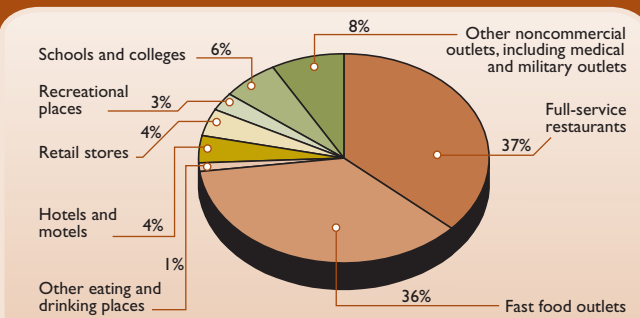
U.S. and EU-25 have large shares of world production in many commodities



Source: Food and Agriculture Organization of the United Nations.

Diet and Health

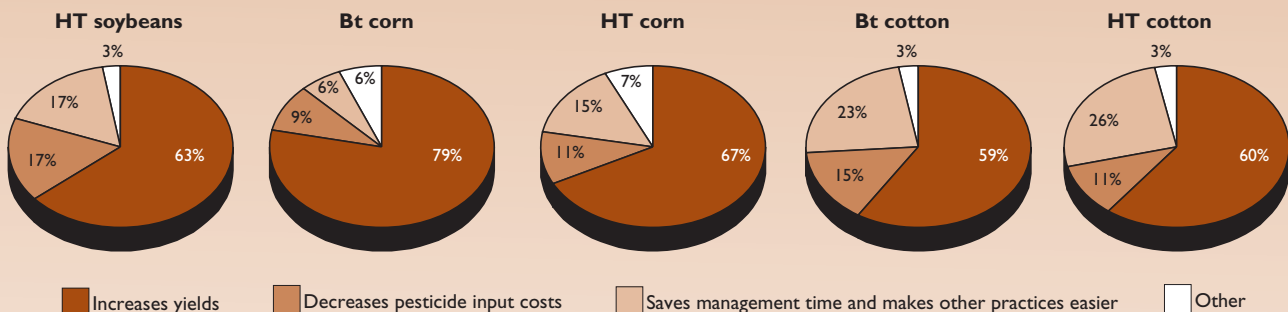
Fast food and full-service restaurants accounted for 73 percent of the \$445 billion worth of foods consumed away from home in 2003



Note: Percentages do not sum to 100 because of rounding.
Source: ERS Food Expenditure series.

Natural Resources and Environment

Main reasons stated by U.S. farmers for adopting...

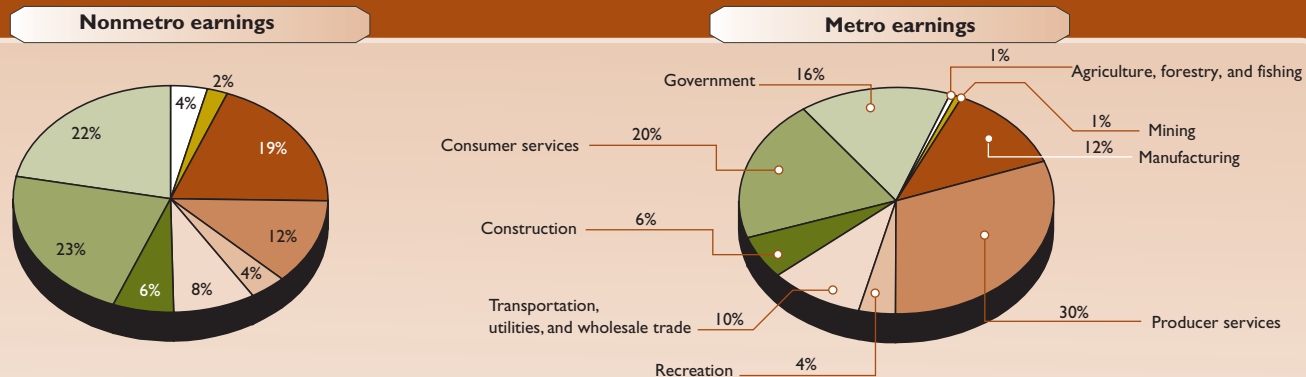


HT = Herbicide tolerant. Bt varieties have insect resistant traits.

Source: Agricultural Resource Management Survey (2001, 2002, & preliminary results for 2003), USDA.

Rural America

Manufacturing accounts for a larger share of nonmetro earnings, while producer services is the largest share of metro earnings, 2002



Source: Calculated by ERS from data from the Bureau of Economic Analysis.

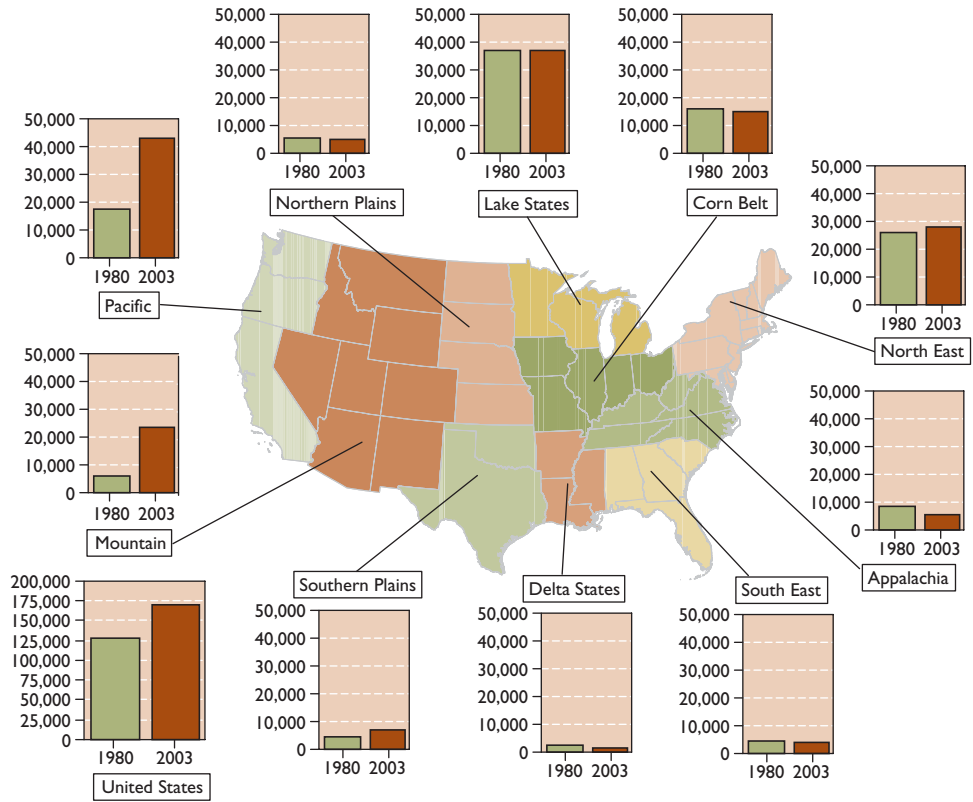
On the Map

Milk production shifts West.

Since 1980, milk production in the U.S. has increased almost 33 percent. Regional production growth has been most pronounced in the Pacific and Mountain regions, the result of development of low-cost systems of milk production in the Pacific region and some Mountain States. Growth has been much slower in the Northeast and Southern Plains, and the other six regions have seen essentially flat or declining production.

Donald Blayney
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Milk production, 1980 and 2003



Note: Units are million pounds of milk.
Source: Compiled by ERS from National Agricultural Statistics Service data.

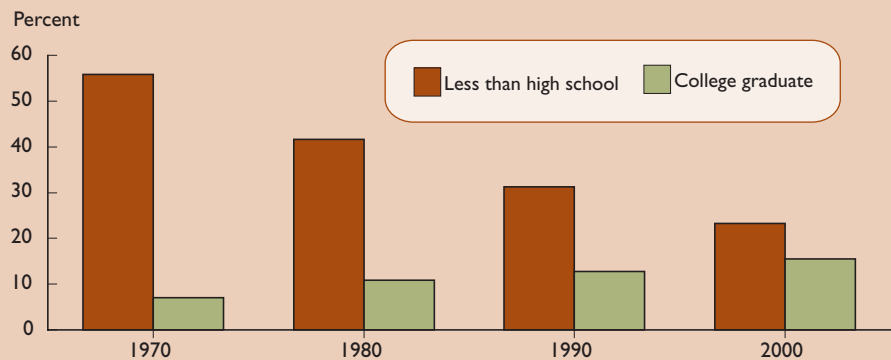
In the Long Run

Nonmetro educational attainment.

From 1970 to 2000, the share of nonmetro adults age 25 and older who did not complete high school fell by more than half—from 56 percent to 23 percent—while the share with at least a 4-year college degree more than doubled, from 7 percent to 16 percent. At the current rate of change, nonmetro educational attainment will reach a historic milestone early in the next decade, as adult college graduates will outnumber adults without a high school diploma. Nevertheless, nonmetro college completion rates remain well below the national average of 24 percent.

Robert Gibbs
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Nonmetro educational attainment, 1970-2000



Note: Metro status is based on the definition of Standard Metropolitan Areas as of June 1993.
Source: 1970, 1980, 1990, and 2000 Census of Population.



USDA, APHIS

Is India a Potential Market for U.S. Agriculture?

Under the aegis of the Emerging Markets Project sponsored by USDA's Foreign Agricultural Service, ERS researchers have been collaborating with counterparts in several Indian institutions to study issues of mutual interest. To date, detailed studies have been completed on the Indian markets for pulses, oilseeds, and poultry. These studies generally indicate that while the domestic market is undergoing rapid structural changes, such changes do not necessarily translate into immediate increases in U.S. agricultural exports to India. Additional studies will examine the economics of plant biotechnology regulations, the implications of the removal of Multi-Fiber Arrangement import quotas on India's textiles and apparel sector, and the prospects for improved marketing efficiency for wheat in India. Information on ERS's program of work on Indian markets is available at www.ers.usda.gov/briefing/india/. **Tom Vollrath, thomasv@ers.usda.gov**

"One-Stop Shopping" for Commodity Data

ERS and six other USDA agencies are cooperating to develop a web-based portal for commodity market data and information, the Commodity Market Information System (CMIS). Through CMIS, users will

be able to access key data and analyses on supply, demand, and prices from several USDA agencies without having to visit each agency website separately. A prototype, expected to be rolled out by the end of 2004, will demonstrate a customer-centric approach toward searchable and user-friendly electronic access to USDA's broad spectrum of commodity market information. **Milton Ericksen, miltone@ers.usda.gov, and Joy Harwood, jharwood@ers.usda.gov**

Studying the Economics of Invasive Species Management

In August 2004, ERS and the Farm Foundation co-sponsored a review of the ERS Program on the Economics of Invasive Species Management (PREISM) in Washington, DC. The objective of the meeting was to review the progress and/or preliminary results of each 2003 PREISM grant or cooperative agreement. PREISM awardees and cooperators made presentations, and several external discussants commented on each paper. Attendees included ERS researchers and representatives from a variety of Federal agencies charged with preventing, monitoring, and managing invasive species. Abstracts of the 2003 PREISM grants are posted on the ERS website at www.ers.usda.gov/briefing/invasivespecies/. **Stan Daberkow, daberkow@ers.usda.gov**

Focusing on Variety

USDA encourages people to eat a variety of fruits and vegetables through the Food Guide Pyramid and participation in the National 5 A Day Partnership. A diet rich in a variety of fruits and vegetables helps one to consume a complete mix of nutrients. Using ACNielsen data, ERS researchers are investigating the factors that influence purchases of fruits and vegetables and identifying obstacles to attaining variety, such as household spending levels and other demographic characteristics. **Hayden Stewart, hstewart@ers.usda.gov**

How Do Mass Marketers Affect Food Prices?

As part of ERS's research program on the dynamics of retail food markets, researchers from ERS and the Massachusetts Institute of Technology (MIT) are examining the impact of supercenters, club stores, and mass merchandisers on retail food prices. Using retail food price scanner data, MIT professor Jerry Hausman and Ephraim Leibtag measured the impact of increased market share by nontraditional retail outlets on food prices. These price changes were then used to estimate the bias in the Consumer Price Index for food eaten at home. **Ephraim Leibtag, eleibtag@ers.usda.gov**

New Releases

Paying for Fruits and Vegetables

Americans do not eat the recommended levels of fruits and vegetables. One argument is that they are expensive, especially when purchased fresh. Using 1999 ACNielsen Homescan data, ERS researchers recently analyzed serving costs of over 150 forms of fruits and vegetables and found that consumers can eat the recommended three servings of fruits and four servings of vegetables daily for 64 cents. This finding and others are presented in a new report, *How*

Much Do Americans Pay for Fruits and Vegetables? (AIB-790). **Jane Reed, allshous@ers.usda.gov**

Effects of Animal Diseases on Trade

Disease outbreaks and related trade restrictions have slowed previously expected high growth in many U.S. animal product exports, with U.S. beef exports most affected. A recent ERS report—*U.S. 2003 and 2004 Livestock and Poultry Trade Influenced by Animal Disease and Trade Restrictions* (LDPM-120-01)—

discusses how animal diseases and disease-related trade restrictions have influenced trade in animal products in the past few years, with an emphasis on 2003 and forecasts for 2004. **Dale Leuck, dleuck@ers.usda.gov**

The citations here and in the rest of this edition are just a sample of the latest releases from ERS. For a complete list of all new ERS releases, view the calendar on the ERS website: www.ers.usda.gov/calendar/

Rural Sociological Society Annual Meeting

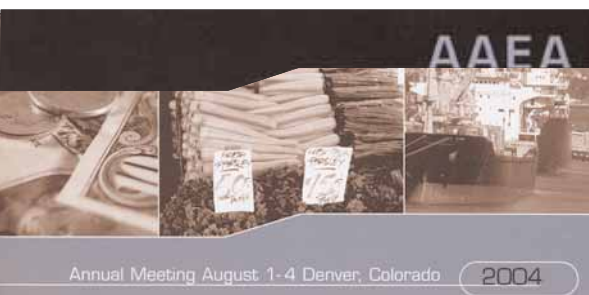
In August 2004, ERS researchers presented a wide variety of findings at the Rural Sociological Society (RSS) annual meeting in Sacramento, CA. RSS was founded in 1937 to promote the development of rural sociology through teaching, research, and extension. Its original members were active as early as 1920 as a section of the American Sociological Society. At the August conference, ERS researchers presented papers on rural population dynamics, the public policy impacts of rapid immigration of Hispanics to non-metro counties, the positive relationship between attractive natural amenities and access to services and immigration of people to rural areas, food costs in nonmetro households compared with those of metro households, and the new ERS county typology codes and their potential usefulness in rural development policy analyses. **Leslie Whitener**, whitener@ers.usda.gov

cultural economics profession who stressed the idea that economists should do relevant and useful work.

How Can Time-Use Data Be Used?

In July 2004, ERS and the Farm Foundation cosponsored a 1-day conference on policy-relevant uses of data from the new American Time Use Survey of the Bureau of Labor Statistics. This important new dataset will allow researchers to analyze the choices people make in how they spend their time, the time and income constraints they face, and the consequences of their decisions. This conference provided researchers, policymakers, and program administrators an opportunity to discuss and identify policy issues that time-use data can illuminate, such as obesity, grocery store access of low-income households, and working time versus household responsibilities. The conference agenda is available at www.ers.usda.gov/emphases/healthy/timeuseconference/agenda.htm. **Karen Hamrick**, khamrick@ers.usda.gov

His presentation on “Changing Competition, New Technology, and Consolidation in the U.S. Retail Food Industry: Implications for Agricultural and Food Suppliers,” provided insights on issues similar to those of the Latin American countries represented at the conference. Other session topics were “Controversy Over Water,” “The Impact of China on Global Agriculture,” “Global Trends in Agro-Food Commerce,” and “What is the New Producer Model?” An overriding theme was the need for producers and processors to compete in global markets and to become more consumer-driven through better integration within the food supply chain. **Phil Kaufman**, pkaufman@ers.usda.gov



Annual Meeting of Agricultural Economists

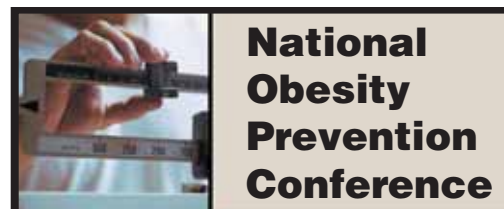
In August 2004, ERS researchers discussed and debated a wide range of issues with their colleagues at the annual meeting of the American Agricultural Economics Association (AAEA) in Denver, CO. A highlight of the meetings was the annual Frederick V. Waugh Memorial Lecture, which featured, for the first time, a USDA economist. Joseph Glauber, Deputy Chief Economist of USDA since 1992, delivered a presentation titled, “Crop Insurance Reconsidered,” in which he assessed the efficacy of crop insurance program changes over the last 15 years. Established in 1991, this lecture series is cosponsored by the AAEA and ERS in honor of an intellectual giant in the agri-

Conservation Reserve Program: Planting for the Future

In June 2004, Marc Ribaud, Patrick Sullivan, and Daniel Hellerstein of ERS participated in the conference “CRP: Planting for the Future,” sponsored by USDA’s Farm Service Agency and the U.S. Geological Survey, held in Fort Collins, CO. Attended by over 200 people, the conference featured presentations by academic researchers, government scientists, program administrators, industry representatives, and Capitol Hill staffers on the theme of how USDA’s Conservation Reserve Program might be best implemented, given social and environmental goals. **Marc Ribaud**, mribaud@ers.usda.gov

Integration of the Food Supply Chain

In June 2004, at the 1st Global Agri-Food Forum in Mexico City, Mexico, ERS researcher Phil Kaufman participated in a panel session titled, “Strengthening the Integration of the Food Supply Chain.”



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With a better understanding of the social, economic, and behavioral causes of poor dietary choices, more effective prevention measures can be designed. Thus, the conference will focus on research themes, both short- and long-term, and steps that can be taken to prevent further increases in the prevalence and severity of obesity. The conference will be science-based, but will have a practical orientation to aid in developing practical strategies to prevent obesity. The conference will be open to the public, but space is limited.

For more information or to register see: www.usda.gov/Newsroom/indexNOPC.html. **Steve Crutchfield**, scrutch@ers.usda.gov

Security Analysis System for U.S. Agriculture



David Nulph, Vincent Breneman, Greg Pompelli, Fred Hoff, Bryan McEnaney, and Amy Goldian.
Not shown: Patrick Canning, Paul Chan, Cory Schinkel, and Zhi Wang.

In response to increased risks to the Nation's agriculture and food supply due to bioterrorism, ERS's Security Analysis System for U.S. Agriculture (SAS-USA) team created a unique system to quantitatively assess agriculture/food emergencies. The team established a framework to systematically tie all food supply processes from farm production, food manufacturing, and distribution of food products to food consumption in every region of the country. To create this geographic information system, the team integrated a broad range of data from agencies within USDA and from many other Federal agencies. These data collectively describe the interdependencies among different business sectors spanning all 50 States, the District of Columbia, and about 500 U.S. ports with an unprecedented level of geographic detail.

Mitch Morehart



Mitch Morehart has been a key contributor in the design and use of USDA's Agricultural Resource Management Survey (ARMS) to address the financial status of farms and the economic position of farm households. ARMS is the only annual, national-level survey of U.S. farm businesses and households, providing information about the financial condition of farms, production practices and resource-use decisions of farm operators, and the economic status of farm households. Mitch developed a unique web-based data delivery system to make ARMS data accessible to a wider audience, greatly simplifying the process of providing policymakers and other customers with timely information. His expertise on issues relating to the financial performance of farm businesses has helped both USDA and ERS to better position themselves to provide timely, accurate, and comprehensive information on farm finance and farm performance to policymakers, researchers, and other customers.

USDA Animal Waste Management Team



ERS members: Vincent Breneman, Marcel Aillery, Margriet Caswell, Robert Johansson, Noel Gollehon (co-leader), and Marc Ribaud. Not shown: Jeanmarie Agapoff (now with Farm Service Agency) and Mark Peters (now with Agricultural Marketing Service). Natural Resources Conservation Service members, not shown: Daniel Meyer (co-leader), Glenn Carpenter, Larry Edmonds, Robert Kellogg, Lynn Knight, Barry Kintzer, Charles Lander, Patty Lawrence, Jerrell Lemunyon, Jeffrey Loser, and David Moffitt. Cooperative State Research, Education, and Extension Service members, not shown: Richard Hegg and Mary Ann Rozum.

Structural changes in the U.S. livestock sector over the past 20 years have increased both the size and the concentration of animal feeding operations. With these increases came growing public scrutiny and concern for the potential negative effects of livestock waste on the Nation's water resources. The Animal Waste Management Team, consisting of experts from three USDA agencies, conducted innovative and timely analysis of the economic and policy options associated with animal waste management. Co-led by representatives from ERS and the Natural Resources Conservation Service, the team's analysis informed the design of landmark USDA programs and Environmental Protection Agency regulations to protect water resources from nutrients contained in animal waste. The team's research findings also contributed to the implementation of the conservation provisions in the Farm Security and Rural Investment Act of 2002 by informing the structure and expansion of USDA assistance programs to address the challenge of managing manure on working lands.

Market Analysis Program Innovators Team



Back row: (l to r) Mary Maher, Leland Southard, Wynnice Pointer-Napper, Gary Lucier, and John Dyck. Front row: (l to r) Allen Baker, Joy Harwood, Fannye Lockley-Jolly. Not shown: Neil Conklin, Lewrene Glaser, David Johnson, Andy Kerns, Gerald Bange (World Agricultural Outlook Board), and Dennis Shields (now with Farm Service Agency).

An entirely new market environment with new and different information needs now confronts decisionmakers, reflecting changes in the structure of domestic and global agricultural markets. Simultaneously, information technology has revolutionized the supply of market information on the Internet, vastly expanding the potential reach of ERS's market analysis program. In cooperation with the World Agricultural Outlook Board, ERS's Market Analysis Program Innovators Team created a program that meets user needs through web-focused distribution, customer-friendly materials, and targeted coverage of global food and agriculture product markets. Public- and private-sector decisionmakers who seek timely, insightful analysis of the forces shaping agricultural commodity market behavior now make the ERS outlook webpage—www.ers.usda.gov/publications/outlook/—their first stop.

USDA Food Security Measurement Team



Steven Carlson (Food and Nutrition Service), Margaret Andrews, and Mark Nord.

In less than a decade, the U.S. household food security measure has become an important, nationally recognized research tool for evaluating Federal food assistance programs and monitoring the adequacy of food access in U.S. households. Food security—consistent access to enough food for active, healthy living—is one of several necessary conditions for a population to be healthy and well nourished. USDA's Food Security Measurement Team, with members from ERS and the Food and Nutrition Service, spearheaded the effort to develop, assess, and improve the measure. The food security survey, first conducted as a supplement to the 1995 Current Population Survey, provided the Nation's first nationally representative assessment of household food security and the extent of food insecurity and hunger. The annual food security survey has provided data for the *Household Food Security in the United States* series of reports that monitor changing food security conditions. Food security statistics based on the survey data are used by Federal agencies, State departments of human services, regional and community emergency food providers, and advocacy organizations, and are widely cited by national and local news media.

Margriet Caswell



Over 90 presenters and panelists from 29 different countries participated in last year's International Ministerial Conference and Expo on Agricultural Science and Technology, held in Sacramento, California. Cosponsored by the USDA, the U.S. Agency for International Development, and the U.S. Department of State, the conference convened many high-level government officials—including about 60 ministers of agriculture, 18 ministers of science and technology, and about a dozen ministers of the economy, trade or industry—to discuss how science and technology can help enhance agricultural productivity, food security, and economic growth in developing countries. As part of an interagency team led by USDA's Foreign Agricultural Service, Margriet Caswell drafted a USDA report, *21st Century Agriculture: A Critical Role for Science and Technology*, in which she framed the key issues for discussion at the conference.

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