



The Council  
on Food  
Agricultural  
and Resource  
Economics

An Organization of  
Agricultural Economics

## Optimizing Policy Tools: Economics Data and Modeling

In Fall, 2006, The Council on Food, Agricultural and Resource Economics hosted a symposium on the changing information needs of the agricultural industry, specifically addressing two aspects of the nation's food and agricultural data and analytic systems:

success stories and needed improvements. In terms of success, participants explored examples of how various databases help inform and improve policies and in doing so enhances our citizens' quality of life.

Participants also examined ways to extend, integrate and improve those databases. Highlights of the symposium are presented here.

# DATA SUCCESS STORIES

## OPTIMIZING POLICY TOOLS: ECONOMICS DATA AND MODELING

### DATA NEEDS



While the United States benefits from arguably the world's most comprehensive and most accurate food and agricultural data, improvements are needed. In the food arena, we need to further integrate and extend our data and analytical frameworks. The centerpieces of such a framework include nationally representative consumer and retail surveys of:

- ❖ Food prices;
- ❖ Retail sales;
- ❖ Purchase and consumption of food at home and away from home; and
- ❖ Consumer behavior, attitude, and dietary and health knowledge.



Building that framework is the goal of the Consumer Data and Information Initiative at USDA's Economic Research Service (USDA-ERS). The ultimate goal of the framework, however, goes well beyond data and analysis. It will provide a basis for policies that (1) give consumers access to a low-cost, safe, secure and nutritious food supply and (2) enable firms to prosper in diverse and ever-changing food markets.



To achieve such lofty goals, the Initiative has three prongs:

- ❖ Adding modules to existing governmental surveys;
- ❖ Accessing proprietary data; and
- ❖ Linking data sources.

Clearly, no single survey or data source can provide all the information needed to understand the food system and craft policies to improve the wellbeing of consumers and providers alike. With this three-pronged approach, however, we can weave together various sources of information and in the process expand our knowledge, ease the burden on survey respondents and save taxpayers money. Below are but two examples of work taking place under this initiative. The first looks at the need for proprietary data to improve analysts ability to measure changes in food prices. The second examines the need to link price data to nutritional and health data to better understand the influence price has on those two critical measures.

### LINKING PRICE AND NUTRITIONAL DATA

*Oral Capps Jr. and Rodolfo Nayga, Texas A&M University*

The National Health and Nutrition Survey (NHANES) assesses the health and nutritional status of adults and children in the United States through a unique combination of interviews and physical examinations. As such, it yields one of our nation's crown jewel databases. It includes demographic, socioeconomic, food/dietary and health-related questions. NHANES data are used to determine the prevalence of major diseases, the risk factors for diseases, the nutritional status of the population and the association of nutritional status with health promotion and disease prevention.

NHANES does not, however, include price data. And that is a missed opportunity. Food choice-and by extension, nutrition and health-depends a great deal on food prices. Understanding the linkages among them, therefore, requires good data. Lack of good data makes it difficult to analyze the potential impact of any policies that affect the relative cost of foods. As one example, how can we analyze the use of so-called "snack taxes" to reduce obesity if we do not know how price influences food choice and consumption?

Prices of goods and services are indispensable components in the economic modeling of food consumption and dietary behavior. A price database linked to NHANES should be developed.

### USING CONSUMER-BASED DATA TO EXAMINE RETAIL FOOD TRENDS

*Ephraim Leibtag, USDA Economic Research Service*

Over the past 10 years, the retail food market has changed dramatically. And, one of the primary drivers of that change has been the growth of nontraditional retail food outlets. Nontraditional retailers-such as Wal-Mart, Costco, Target and others-have helped to increase the variety of options available to consumers while at the same time providing lower cost options to consumers.

Unfortunately, the Consumer Price Index (CPI) does not fully account for the lower price option offered by nontraditional retailers when they enter and expand in a geographic market. As a result, significant differences exist between price change measured using proprietary scanner data and the CPI estimate of price change. Accessing proprietary data to adjust the CPI to account for lower cost foods at nontraditional retailers would greatly enhance our data and analysis pertaining to consumer price and choice.



## LINKING SURVEY TO EXISTING DATABASE HELPS UNDERSTAND (AND IMPROVE) FARMERS' OFF-FARM INVESTMENTS

David Trechter and Greg Lawless, University of Wisconsin

Like everyone else, farmers seek to increase their wealth while reducing their risks. For many, that leads to making "off-farm" investments in stocks, bonds and other financial opportunities. Understanding just how these investments are made-by whom, based on what criteria and using what information-can improve educational offerings aimed at helping farmers make better investments.

Collaborating with the U.S. Department of Agriculture's National Agricultural Statistics Service, researchers in the University of Wisconsin System surveyed Wisconsin farmers and linked those results to USDA's Agricultural Resource Management Survey (ARMS). In doing so, the researchers created a winning situation that:

- ❖ Obtained better--more comprehensive and more accurate--data;
- ❖ Saved taxpayer dollars;
- ❖ Minimized the time required of farmers to respond; and
- ❖ Extended the use and usefulness of existing databases.

Most importantly, the effort yielded results that can be used to help farmers make better investment decisions. For example, we now know that just over half of the farmers surveyed have made off-farm investments in the last five years. We also now know that farmers are very interested in investing in energy-related efforts: wind (46 percent), ethanol (44 percent) and biodiesel (43 percent). Indeed, the researchers estimate that Wisconsin farmers might invest an additional \$200 million in agriculture-related off-farm energy opportunities.

Unfortunately, the survey results also highlight great needs. Some 56 percent of surveyed farmers lack investing experience and 47 percent say they are unaware of investment opportunities. Only a quarter to a third of the farmers rate their financial evaluative abilities as good to excellent. Such obstacles to off-farm investment cry out for educational offerings designed to help farmers overcome them. Yet without the survey, we might never have known about them.

Finally, the survey shows that farmers recognize the need for investment education and indicates their preferences for how that education should be delivered. More than one-third are interested or extremely interested in educational programming focused on off-farm investment, with 45 percent preferring face-to-face one-day programs and 25 percent interested in on-line programming.



## USING ARMS DATA TO QUANTIFY THE IMPACTS OF HIGHER FUEL AND FERTILIZER COSTS

Pat Westhoff, Food and Agricultural Policy Research Institute/University of Missouri

The uses of data from USDA's Agricultural Resource Management Survey are many. For example, the data can be used to:

- ❖ Establish detailed operating costs for crops and livestock;
- ❖ Estimate producer returns;
- ❖ Drive model supply equations;
- ❖ Establish beginning debt levels for representative farms; and
- ❖ Support USDA estimates of farm income.

Indeed, ARMS data are used again and again in analyses that inform public and private decisions about agriculture. In a recent example, the Food and Agricultural Policy Research Institute (FAPRI) used ARMS data to quantify the impacts of increases in fuel and fertilizer prices, which have hurt agricultural producers and caused shifts in commodity supply and demand.

The analysis compares national average producer returns, crop production, crop prices, farm program spending and farm-level indicators under two scenarios. The first-a baseline-assumes current government policies and energy prices that decline slowly from current levels. The second assumes fuel and fertilizer costs that exceed baseline levels by 10 percent beginning in 2007. The analysis shows that

- ❖ Fuel and fertilizer account for approximately one half of operating costs for corn and wheat. Therefore, a 10 percent increase raises total operating costs by about 5 percent. In contrast, fuel and fertilizer account for only a quarter of soybean operating costs.

- ❖ A 10 percent increase in fuel and fertilizer costs increases per-acre production costs by \$19 for rice, \$18 for cotton, \$10 for corn, \$5 for wheat and \$2 for soybeans.
- ❖ Higher fuel prices raise prices for ethanol and biodiesel and result in increased production of biofuels.
- ❖ From 2007 to 2010, higher production costs outweigh the effect of increased demand for corn to produce ethanol, so corn acreage declines by an average of 290,000 acres. Cotton and wheat acreage also decline, but soybean acreage increases as producers shift away from crops experiencing larger cost increases. The total amount of land planted to 11 major crops declines by 770,000 acres (.3 percent).
- ❖ Higher market prices mitigate the effects of increased production costs on corn and wheat producer income. Net returns decline by an average of about \$4 per acre for both corn and wheat.
- ❖ Small increases in the price of cotton are offset by reduced government payments, leaving cotton producer net income down by nearly the full amount of the increase in production costs (\$17 per cotton base acre).
- ❖ Summing it all up, farm-level results show negative impacts on producer net income resulting from the changes in production costs, market prices and government payments.

Without this analysis (and without ARMS), producers and policymakers alike would be much less informed on this critical aspect of agricultural production.

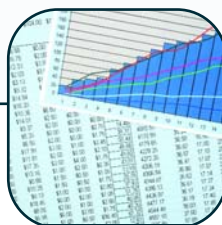
## CONCLUSION

Good decisions-public and private-require good data. And the United States is fortunate to have some of the world's best data-especially in the realm of agriculture and food. The Agricultural Resource Management Survey and the National Health and Nutrition Survey are but two fine examples. Both yield valuable data that inform countless decisions. Yet there is room for improvement.

With respect to ARMS, we need such things as state-level data and data that would allow us to answer questions like, "What percentage of a given crop is produced at what cost?" and "How do costs and yields differ for continuous cropping versus crop rotation?"

With respect to NHANES, we need price data with which to analyze the linkages between the price of food and the choice and consumption of food. In addition, data on prices could be improved by accessing proprietary data.

In short, we must continue expanding and integrating our food and agricultural data and analytical systems to yield the best possible understanding and craft the best possible policies for the two critical sectors. Our wellbeing depends on it.



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