

# Pennsylvanians' Knowledge of Agriculture

A report by:  
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## EXECUTIVE SUMMARY

In 2005, researchers at Pennsylvania State University surveyed 1,521 Pennsylvanians in 65 counties to determine their knowledge of and perceptions about agriculture in the state. The study looked to: assess the level of agricultural knowledge of Pennsylvanians; ascertain how personal characteristics and frequency of rural visitation related to agricultural knowledge and to the perceptions of citizens about various agricultural issues; explore the relationship of agricultural knowledge to public perceptions of selected agricultural issues; and suggest how information on Pennsylvanians' knowledge, experiences, and perceptions of agriculture are relevant to policy makers.

The study results showed that, overall, most participants believed they knew very little about the impacts of agriculture on the state, farming production practices, or agriculture and the environment. Their self-rating on matters related to food and nutrition was somewhat higher, but even here a substantial majority believed they were not well-informed. When asked to respond to factual questions dealing with the different knowledge areas, many participants failed to answer correctly, and even those who did select the right answer were seldom certain of their responses. For some questions, respondents who thought their answers were correct often provided the wrong answers. Many of the answers reflected misperceptions about agriculture and its impact on the state.

The survey analysis showed that direct personal contact with farming and visiting rural areas were clearly the most important experiences associated with higher levels of agricultural knowledge. The findings also showed that people who have greater agricultural knowledge differ in their views and actions from those with less understanding of agriculture, and this, coupled with the low levels of knowledge found in the population studied, suggests that it is important that efforts be made to educate the public about the nature and impacts of agriculture.

To educate the public, the researchers recommended maintaining, and possibly expanding, Agriculture in the Classroom programs that provide agricultural education to school children; developing and expanding programs that allow people to visit working farms in the state; intensifying programs to enhance agricultural tourism and rural visitation; and developing a periodical directed to the general population, which features articles on Pennsylvania farming, agritourism, farm facts and historical notes, and agricultural research findings.

*The Center for*  
  
**Rural Pennsylvania**  
*A Legislative Agency of the Pennsylvania General Assembly*

# INTRODUCTION

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The agricultural sector plays a large role in Pennsylvania's economy. According to the 2002 Census of Agriculture, the commonwealth 58,000 farms, which cover 7.7 million acres, help to rank Pennsylvania among the top five producing states for mushrooms, pumpkins, eggs, dairy, grapes, Christmas trees, corn silage, apples, peaches, pears, and tart cherries. Farm and processed food output in 2002 was valued at approximately \$4 billion.

Many citizens may have limited understanding of agriculture despite its important role in the commonwealth. Most Pennsylvanians today have only limited contact with farms and farming. Only 2 percent of the state's residents are directly involved in agricultural production,

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and most families are several generations removed from those who tilled the soil. The food and fiber produced on farms is transformed, processed, packaged, and marketed far from the fields and farmsteads where it was grown. Food is often viewed as a supermarket purchase, rather than a product resulting from the management and toil of farmers working with plants and animals.

Agricultural literacy of Pennsylvanians and citizens throughout the United States is of concern to farm leaders and agricultural organizations. These groups believe public support for agriculture is reduced by the failure of Americans to understand the nature of farming and agriculture's contributions to the lives of citizens and the economic and social well-being of the nation. Perhaps more important, the level of agricultural knowledge is seen as possibly affecting decisions of national, state, and local leaders as they develop policies relating to and impacting farmers and the agricultural industry. Despite such concerns, there has been virtually no research to assess public knowledge of agriculture and/or the relationships of such knowledge to views of agricultural issues. This research was undertaken to help fill this information gap.

## Project Goals

The study surveyed Pennsylvanians across the state about their knowledge of agriculture in the commonwealth and included four goals:

- To assess the level of agricultural knowledge of Pennsylvanians;
- To ascertain how personal characteristics, such as age, gender, place of residence, education and income, and farm experiences, different sources of information about agriculture, and frequency of rural visitation relate to agricultural knowledge and to the perceptions of citizens about various agricultural issues;
- To explore the relationships of agricultural knowledge to public perceptions of selected agricultural issues; and
- To suggest how information on Pennsylvanians' knowledge, experiences, and perceptions of agriculture are relevant to policy makers.

# METHODOLOGY

The researchers surveyed Pennsylvania residents from October to December 2005 to assess their knowledge of agriculture in the state. The original sample included 3,000 names and a total of 1,521 residents living in 65 of the state's 67 counties responded to the questionnaire, giving the survey a response rate of 56 percent.

Philadelphia and Allegheny counties were not included in the study. Since residents of these counties were expected to have less direct contact with farming and to be less knowledgeable of agriculture, it is likely that the level of knowledge found in the current study is somewhat higher than that of the general population.

Of the 1,521 respondents, 53 percent were male and 47 percent were female. The median age of the participants was 55 years, with 25 percent less than 45 years of age, 36 percent between 45 and 59 years of age, and 39 percent 60 years or older. About one-third had completed a four-year college degree, while 37 percent had no formal schooling beyond high school. (See Table 1). More than 60 percent were employed either full-time or part-time. Fifty-eight percent described their current place of residence as "in a city or in the suburb of a city," while 42 percent described their residence as being located in a town or the countryside located in a rural area. Half of the sample participants earned less than \$50,000, with one in five reporting less than \$25,000, and nearly 30 percent indicating \$75,000 or more in household income.

**Sociodemographic Characteristics of the Sample,  
Compared with the Population of the 65 Sampled Counties and All 67 Pennsylvania Counties**

<b>Sociodemographic Characteristics</b>	<b>Survey Respondents %</b>	<b>Population of 65 Sampled Counties* %</b>	<b>Population of All 67 Counties* %</b>
<b>Gender</b>			
<b>Male</b>	<b>53.2</b>	<b>47.8</b>	<b>47.3</b>
<b>Female</b>	<b>46.8</b>	<b>52.2</b>	<b>52.7</b>
<b>Age</b>			
<b>Less than 45 yrs</b>	<b>25.5</b>	<b>46.7</b>	<b>47.2</b>
<b>45-59 yrs</b>	<b>35.8</b>	<b>26.3</b>	<b>25.8</b>
<b>60 yrs &amp; over</b>	<b>38.7</b>	<b>27.0</b>	<b>27.0</b>
<b>Education</b>			
<b>&lt; HS Grad</b>	<b>8.0</b>	<b>17.1</b>	<b>18.1</b>
<b>HS Grad</b>	<b>29.0</b>	<b>39.4</b>	<b>38.1</b>
<b>Some post HS</b>	<b>29.6</b>	<b>21.3</b>	<b>21.4</b>
<b>College grad &amp; over</b>	<b>33.4</b>	<b>22.2</b>	<b>22.4</b>
<b>Rural Counties</b>			
<b>Rural</b>	<b>35.6</b>	<b>35.8</b>	<b>27.6</b>
<b>Urban</b>	<b>64.4</b>	<b>64.2</b>	<b>72.4</b>
* Population figures are for "adults" in the relevant counties. However, the meaning of "adults" varied somewhat, depending upon available census data. For gender and age, the data were for all persons 18 years and older. Education was for persons 25 years and older.			

*Source: U.S. Bureau of the Census, Census 2000*

The Center for Rural Pennsylvania defines counties with fewer than 274 persons per square mile as rural. By this definition, 36 percent of the sample members lived in rural counties.

Respondents were asked to rate their own knowledge of: the social and economic impacts of agriculture on the state; agricultural production practices; and the relationship between agriculture and the environment, and foods and nutrition. They were also asked to respond to a series of true/false and multiple-choice questions dealing with facts about these four substantive areas.

Other questions asked how frequently they used various sources of information about agriculture; whether they had various types of farm experiences; how frequently they visited farm areas for differing activities; their feelings about farmland preservation, maintaining family farms, local regulation of agricultural practices, genetic modification of agricultural crops, and other agricultural issues; and the frequency with which they made particular consumer buying decisions and participated in environmentally protective activities.

## RESULTS

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Overall, most survey participants knew very little about the impacts of agriculture on the state, farming production practices, or agriculture and the environment. Their self-rating on matters related to food and nutrition was somewhat higher, but even here a substantial majority felt they were not well-informed.

For example:

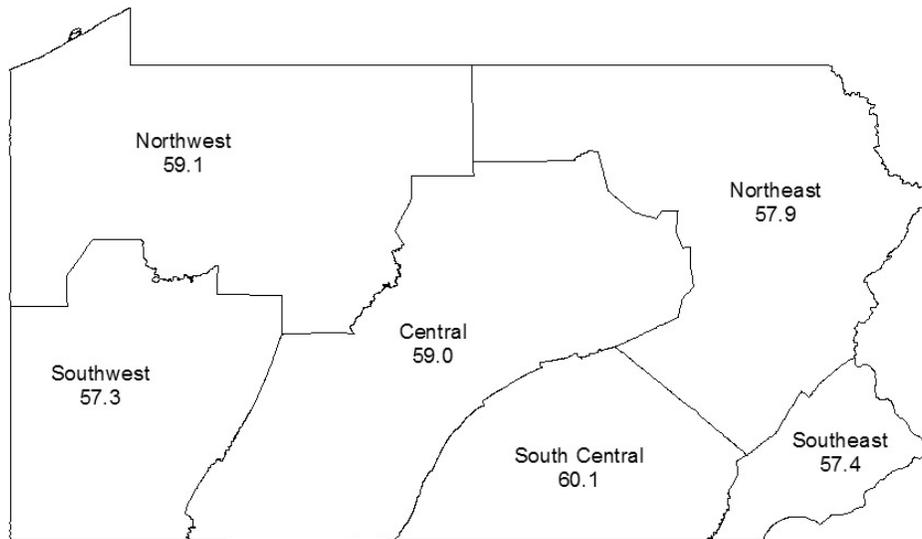
- On a scale of one (almost no knowledge) to 10 (a great deal of knowledge), more than 40 percent gave themselves ratings of one or two, and more than 80 percent rated their knowledge as five or less in regard to the social and economic impacts of agriculture, farming practices, and agriculture and the environment.
- Forty percent rated their knowledge of food and nutrition as five or less on the knowledge scale.
- Many subjects wrote comments on their questionnaires indicating that they knew little about farms or farming.

When asked to respond to factual questions dealing with the different knowledge areas, many subjects failed to answer correctly, and even those who did select the right answer were seldom very certain of their responses. For some questions, even high levels of certainty were associated with incorrect answers. Many of the answers reflected misperceptions about the nature and impact of agriculture on the state.

For example, subjects:

- Tended to overestimate the number of farms in the state, and underestimate the extent to which the number of farms and acres in farms had declined over time.
- Overestimated the average size of Pennsylvania farms and the proportion of farms having sales of \$100,000 or more.
- Were likely to underestimate the percentage of the state's workforce employed in the agricultural industry (defined as farming, the production and marketing of farm inputs and the processing, wholesaling and retailing of food and fiber products).
- Were likely to underestimate the productivity of agriculture in terms of the number of persons a single U.S. farmer can feed.

**Figure 1. Mean Agricultural Knowledge Scores by Region**



Most of the sample members had little farm experience and only infrequently visited rural areas.

For example:

- Only 3 percent were currently farm residents, and less than 25 percent had ever lived on a farm.
- Although 40 percent reported frequent drives/rides in the country, and 33 percent reported frequent visits to rural areas to experience the natural environment, the majority reported only occasional visits.
- Just 18 percent reported receiving a great deal of information about agriculture from first-hand experiences on farms.

The researchers calculated ag knowledge scores for each participant to measure the percentage of 60 knowledge items he/she had answered correctly. Scores ranged from 30 to 90 percent correct, with a mean of 58 percent.

Direct personal contact with farming and visiting rural areas were clearly the most important experiences associated with higher levels of agricultural knowledge.

For example:

- Persons who had lived or worked on a farm had higher ag knowledge scores than those who did not have such experiences.

- Having one or both parents raised on a farm was associated with higher knowledge levels.
- Obtaining information from first-hand experiences on farms and/or direct contact with farmers were both more strongly related to higher ag knowledge scores than using other information sources.
- Frequencies of visiting rural areas to experience the natural environment for recreation or vacations were predictive of higher agricultural knowledge, but going to shop or visiting friends or relatives were not.
- Older citizens, those with higher education and income levels, males, and those living in the country were more knowledgeable about agriculture than were their opposites.
- The higher the percentage of a county's workforce engaged in extractive industries (farming, forestry, fishing, and mining), the greater the agricultural knowledge of its residents.
- People residing in the south central, north-west, and central regions of Pennsylvania tended to have higher knowledge scores than did those living in the southeast, northeast, or southwest regions (See Figure 1).

Ag knowledge scores were related to how people viewed a number of issues related to agriculture in the state:

- Support for farmland preservation in the state was nearly universal, with more than 97 percent of the survey respondents indicating that they endorsed the state's efforts. Such support did not vary depending upon agricultural knowledge.
- In response to questions about the importance of various reasons for preserving farmland, those with higher ag knowledge scores tended to rate "assist farmers to make a living" as less important than did their less knowledgeable peers, perhaps reflecting the higher knowledge ag participants' perception that preservation efforts that purchase development rights do little to actually assist farmers in making a living.
- Those with high knowledge scores were more likely than those who were less knowledgeable to favor maintaining family farms.
- The higher the level of knowledge people had about agriculture, the less likely they were to support community regulation of farming practices, including regulating the: use of agricultural chemicals, spreading of manure near residential areas, inspection of farms to ensure animal welfare, prohibition of slow moving farm machinery from highways, and general use of land. These differences persisted

even when the effects of differences in respondents' personal characteristics, farm experiences, and frequency of rural visitation were statistically controlled.

- When asked how important it was for the state to address each of seven issues facing agriculture in Pennsylvania, those with greater knowledge rated these issues as less important than those who were less well informed about agriculture. These included increasing food safety, improving the welfare of farm animals, strengthening the rural economy, and altering current government policies that impact on agriculture. How much these responses reflected differences in the perceived importance of these issues and how much they reflected differences associated with the state dealing with these issues was not clear from the current data.
- Those with higher ag knowledge scores were more likely to report that they had heard of and understood something about genetic modification (GM) of agricultural crops. They were also more likely to report that they had positive feelings about GM.
- The level of agricultural knowledge was positively related to the likelihood that people would participate in various activities directed to environmental protection and conserving natural resources.

## POLICY CONSIDERATIONS

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As the study demonstrated, knowledge of agriculture can and does affect how people view agricultural issues. Such knowledge is related to an individual having personal experiences with farms and contacts with rural areas. If the actions of lawmakers at the federal, state and local levels are to meet the needs of both society and farmers, and be effective in promoting agricultural production while protecting the environment, it is important that the public and its leadership understand the nature and contributions of agriculture. This study suggests that widespread citizen knowledge is lacking and that many people simply

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do not possess basic knowledge of agriculture. Therefore, efforts to increase public knowledge in this area are warranted.

For example, the work of the Ag in the Classroom (AITC) programs, coordinated throughout the nation by the U.S. Department of Agriculture and involving statewide leadership by the Pennsylvania Farm Bureau, should be maintained and expanded to train school teachers and provide educational materials so agricultural information may be better integrated into the K-12 curricula.

However, as the study shows, there is a pressing need to increase the agricultural knowledge of Pennsylvania's adults as well. Programs are needed to reach families and individual citizens to provide information on the nature of farming and the importance of agriculture to the commonwealth. Such activities could take many forms – increasing the availability of farm vacations, enriching local and regional fair experiences, increasing attendance at statewide agricultural events, such as the State Farm Show and Ag Progress Days, and developing and disseminating informational publications.

To accomplish these tasks, the researchers suggest three specific considerations:

- Increased emphasis should be given to expanding programs that allow people to visit working farms in the state. These would include farm vacations, farm tours, and farm-based bed-and-breakfast businesses. While the state has encouraged these programs in the past, the importance of on-farm experiences in increasing knowledge of agriculture was found

to be so great that additional development of these opportunities should be encouraged. To that end, some incentive payments (perhaps using money from Growing Greener or First Industry funds) may be made available to farms that initiate and carryout such programs.

- Programs to enhance agritourism and rural visitation in the state should be intensified. Again, the state has made excellent advancements in this area, but more can be done to couple two large state industries – agriculture and tourism – for the continuing benefit of both. Encouraging farmers to provide direct marketing opportunities, such as farm markets and/or farm stands, in rural areas near population concentrations by providing financial incentives to individual farmers and to farm groups would not only encourage rural visits by nonfarmers but also directly affect farm incomes, thus yielding direct dividends for the incentive investments.

- A periodical publication directed to the general population and made available at nominal cost (or free) may be developed to highlight Pennsylvania agriculture. Features could include articles showcasing particular farms and farmers in the state, information on rural tourism and farm vacations, locations of farm markets and direct marketing locations, farm facts about the commonwealth, information on emerging farm issues, historical notes on farming in the state, and research findings related to agriculture.

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The Center for Rural Pennsylvania is a bipartisan, bicameral legislative agency that serves as a resource for rural policy within the Pennsylvania General Assembly. It was created in 1987 under Act 16, the Rural Revitalization Act, to promote and sustain the vitality of Pennsylvania's rural and small communities.

Information contained in this report does not necessarily reflect the views of individual board members or the Center for Rural Pennsylvania. For more information, contact the Center for Rural Pennsylvania, 200 North Third St., Suite 600, Harrisburg, PA 17101, telephone (717) 787-9555, fax (717) 772-3587, email: [info@ruralpa.org](mailto:info@ruralpa.org).

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