A STUDY OF AGRICULTURAL LITERACY OF ELEVENTH GRADE STUDENTS IN OHIO RURAL SCHOOLS

A Thesis
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Graduate School of The Ohio State University

By
Michael L. Gower, B.S.

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Master's Examination Committee:
Dr. Joseph A. Gliem, Adviser
Dr. Wesley E. Budke

Approved by

[Signature]
Adviser
Agricultural Education Graduate Program
ABSTRACT

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program.

Seventeen schools with a secondary agricultural education program and 15 schools without a secondary agricultural education program participated in the study. Responses were received from 716 students. The instrument used in the study was the Agricultural Awareness Instrument, which measured agricultural knowledge and perception toward agriculture of eleventh grade students. Internal consistency was calculated for the agricultural knowledge section (.90) and the perception toward agriculture section (.81).

Findings for agricultural knowledge were as follows. The agricultural knowledge mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was significantly different than
the agricultural knowledge mean score of students not enrolled in agricultural education in schools with a secondary agricultural education program. The agricultural knowledge mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was also significantly different than the agricultural knowledge mean score of students in schools without a secondary agricultural education program. Regression analysis indicated that seven demographic variables explained 22% of the variance in agricultural knowledge mean scores.

Findings for perception toward agriculture were as follows. The perception mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was significantly different than the perception mean score of students not enrolled in agricultural education in schools with a secondary agricultural education program. The perception mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was also significantly different than the perception mean score of students in schools without a secondary agricultural education program. Regression analysis indicated that six demographic variables explained 21% of the variance in perception mean scores.

Conclusions drawn from the study were as follows. (1) Agricultural education programs did make a difference in increasing basic agricultural knowledge of students; thus increasing their agricultural literacy. (2) Agricultural education programs did make a difference by allowing students to have a more positive perception toward agriculture; thus increasing their agricultural literacy.
Dedicated to my wife and family
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VÍTA

November 8, 1974 ............................................ Born
Union City, Indiana

1993 .......................................................... Diploma
Mississinawa Valley High School
Union City, Ohio

1996 .......................................................... Marriage
Fort Recovery, Ohio

1998 .......................................................... B.S. Agriculture,
The Ohio State University
Columbus, Ohio

1998 – Present ................................................. Graduate Research Associate,
Department of Human &
Community Resource
Development
The Ohio State University
Columbus, Ohio

FIELDS OF STUDY

Major Field: Agricultural Education
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CHAPTER 1

INTRODUCTION

Background and Setting

Agricultural literacy is "having knowledge and competency in agriculture" (Deeds, 1991, p. 11). Agricultural literacy has also been viewed as an awareness of the impact agriculture has on society, the environment, and on every individual (Brown, 1991; Law & Peppele, 1990). Others have suggested agricultural literacy deals with a person's knowledge of agriculture and their perception toward the agricultural industry (Wright, 1992). Study after study has shown people lack a basic knowledge and understanding about the industry so vital to their lives, and were thus, agriculturally illiterate (Horn & Vining, 1986; Oliver, 1986; Perey, 1989; Williams & White, 1991; Wright, 1992).

It has been noted throughout the literature, the term agricultural literacy has been synonymous with the term agricultural awareness and both have been used interchangeably. Frick, Kahler, and Miller (1991) defined agricultural literacy as "possessing knowledge and understanding of our food and fiber system" (p. 52). This understanding or awareness of the agricultural industry
has been diminishing with each passing generation. Fewer and fewer Americans today are aware of how agriculture affects them personally, the communities in which they live, and the nation as a whole (National Research Council, 1988).

The agricultural industry is ever changing. The impact of technology and the efficiency in the agricultural industry, as well as the decreasing numbers of people directly involved in production agriculture have all caused changes in how society views agriculture. It is no wonder that Americans lack an awareness of agriculture when more than 98% of the population is non-farm and has been for decades. This has led to a decline in the agricultural knowledge people hold and to an increasing negative perception toward the agricultural industry (Cox, 1994; Horn & Vining, 1986; National Research Council, 1988; Williams & White, 1991; Wright, Stewart, & Birkenholz, 1994). The basic purpose of agricultural literacy has been to produce citizens with a knowledge and understanding of the agricultural industry (Russell, McCracken & Miller, 1990). The National Research Council, Board on Agriculture (1988) believed an agriculturally literate person’s understanding of the agricultural industry included “its history and current economic, social, and environmental significance to all Americans” (p. 1). Many have noted the drastic effects to society when a citizenry is agriculturally illiterate (Law & Pepple, 1990; Mawby, 1984; Nipp, 1988). Numerous authors have suggested that agriculture has been too significant of an industry to only be offered to a small percentage of students in America (National Research Council,
1988; Russell et al., 1990; Swan, 1991). Yet, few systematic agricultural literacy efforts have been made to teach or develop the concepts of agricultural literacy in students of any age (National Research Council, 1988).

The need for a greater awareness of agriculture is evident in today’s society. “Most Americans know very little about agriculture, its social and economic significance in the United States, and particularly its links to human health and environmental quality” (National Research Council, 1988, p. 9). This study will assess the level of knowledge of agriculture and perception toward the agricultural industry of eleventh grade students in Ohio rural schools. The study’s findings can be used to determine differences in the level of knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. The findings can then be used to determine if future efforts are needed to increase agricultural literacy or awareness of Ohio’s students.

**Statement of the Problem**

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural
knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program.

**Research Questions**

Research questions were developed to achieve the purposes of the study. The study was designed to answer the following research questions:

1. Is there a difference in the mean scores for agricultural knowledge of eleventh grade students in the following groups?
   - (a) Students enrolled in agricultural education in schools with a secondary agricultural education program
   - (b) Students not enrolled in agricultural education in schools with a secondary agricultural education program
   - (c) Students in schools without a secondary agricultural education program

2. Is there a difference in the mean scores for perception toward agriculture of eleventh grade students in the following groups?
   - (a) Students enrolled in agricultural education in schools with a secondary agricultural education program
(b) Students not enrolled in agricultural education in schools with a secondary agricultural education program

(c) Students in schools without a secondary agricultural education program

(3) Can a significant amount of the variance in agricultural knowledge mean scores of eleventh grade students be explained from selected demographic variables?

(4) Can a significant amount of the variance in perception mean scores of eleventh grade students be explained from selected demographic variables?

**Definition of Terms**

Agriculture in the Classroom – a joint venture between the United States Department of Agriculture and the United States Department of Education to bring agricultural awareness to students in grades K through 12.

Agricultural Awareness – synonymous with the term agricultural literacy; dealing with a person’s knowledge of agriculture and their perception toward the agricultural industry.
**Agricultural Literacy** – “having knowledge and competency in agriculture” (Deeds, 1991, p. 11), an awareness of the impact agriculture has on society, the environment, and on every individual (Brown, 1991; Law & Pepple, 1990).

**Ag Venture Magazine** – an agricultural awareness magazine published three times annually in Ohio to increase fourth grade students’ awareness of the importance and significance of Ohio’s agriculture.

**Education about Agriculture** – education in the concepts of agricultural literacy, such as production, processing, marketing, distribution, economic and environmental impact, global and social significance, and agricultural policy (National Research Council, 1988).

**Education in Agriculture** – secondary agricultural education to train and prepare students for agricultural careers (National Research Council, 1988).

**Food For America** – a program sponsored by the National FFA Organization to promote education about agriculture to students in grades 1 through 6 (Stagg, 1991).
4-H – a non-formal, educational, youth development program available to youth ages 5 to 19 and a component of the Cooperative Extension Service of the United States Department of Agriculture, which provides the development of life skills and learning experiences through more than 200 project areas.

Literate – “educated” and “having knowledge or competence” (Merriam-Webster’s Collegiate Dictionary, 1998, p. 1071).

Ohio Rural Schools – for the purpose of this study, high schools were randomly selected from those Ohio counties with less than 200,000 persons.

Secondary Agricultural Education Program – a program in a comprehensive 9 through 12 grade high school as identified by the Ohio Department of Education, Division of Vocational and Adult Education, Agricultural Education Service.

Limitations of the Study

(1) implications from this study will only be applicable to students of similar demographics in Ohio rural schools.
Basic Assumptions

(1) All procedures were correctly followed and instruments were administered as directed through a telephone conversation and specified in a written procedure.
CHAPTER 2

REVIEW OF LITERATURE

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. A review of literature about agricultural literacy will be documented in this chapter. The areas will include definitions of agricultural literacy, the importance of agricultural literacy, the changing knowledge and perception toward agriculture, increasing agricultural literacy, the future of agricultural literacy, and the rationale for a study on agricultural literacy in Ohio.
Definitions of Agricultural Literacy

Before the term “agricultural literacy” can be defined, I believe it appropriate to define the term “literacy.” The Merriam-Webster’s Collegiate Dictionary (1998) defined literacy as “the quality or state of being literate” (p. 1070). The term literate was defined as “educated” and “having knowledge or competence” (Merriam-Webster’s Collegiate Dictionary, 1998, p. 1071). Thus, agricultural literacy can be defined as being educated, knowledgeable, and competent in agriculture. Deeds (1991) agreed that agricultural literacy was “having knowledge and competency in agriculture” (p. 11). Brown (1991) concluded that agricultural literacy was “an awareness of the impact agriculture has on the environment, society, and everyday living” (p. 7).

The term agricultural literacy has been around for many years and encompasses the concept of education about agriculture. Russell, McCracken, and Miller (1990) believed agricultural literacy should focus on the areas suggested in the 1988 National Academy of Sciences, National Research Council, Board on Agriculture’s report entitled Understanding Agriculture: New Directions for Education. Russell et al. (1990) believed education about agriculture included:

1. An understanding of the broad definition of agriculture.
2. How food and fiber originate.
3. How food and fiber are processed and distributed.
4. The global economics of food and fiber.
(5) Food safety and quality issues (preservation, pests, pesticides, etc.).

(6) Wise use and management of natural resources (water, soil, minerals, energy, the oceans).

(7) Global climate issues (deforestation, water, soils, drought, etc.).

(8) Global population issues related to food production and distribution.

(9) Human and animal health and nutrition issues (diet, animal agriculture, etc.).

(10) The application of science and business principles to agriculture.

(11) Agricultural trade issues.

(12) Geopolitical issues related to food.

(13) Care for indoor environments, including lawns, gardens, interior plantscapes, recreational areas, and parks. (p. 14)

Law and Pepple (1990) believed agricultural literacy dealt with understanding the principles of modern agriculture including production, processing, distribution, marketing, and consumption of products of the food and fiber system. They also reported agricultural literacy included an awareness of the impact agriculture has on society, the environment, and on every individual. Frick and Spotanski (1990) reached a similar conclusion when they reported an agriculturally literate person was one who understood and appreciated how agriculture affects their environment and personal life.
The National Research Council, Board on Agriculture (1988) defined "agriculture" to

...encompass the production of agricultural commodities, including food, fiber, wood products, horticultural crops, and other plant and animal products. The [term also included] the financing, processing, marketing, and distribution of agricultural products; farm production supply and service industries; health, nutrition, and food consumption; the use and conservation of land and water resources; development and maintenance of recreational resources; and related economic, sociological, political, environmental, and cultural characteristics of the food and fiber system. (p. vi)

The National Research Council, Board on Agriculture (1988) stated, "An understanding of basic concepts and knowledge spanning and uniting all of these subjects define the term 'agricultural literacy'" (p. vi).

The National Research Council, Board on Agriculture (1988) suggested an awareness of agriculture included an understanding of the economic, historic, environmental, and social significance of the food and fiber industry. This definition also included "enough knowledge of nutrition to make informed personal choices about diet and health" (p. 1). Birkenholz, Case, Frick, Gardner, Schumacher, and Wallace (1993) believed agricultural literacy was based on the belief that every person should possess a minimum level of knowledge and understanding of the agricultural industry. Frick and Spotanski (1990) added,
“agricultural literacy does not imply a perfect level of understanding, but rather a minimum level” (p. 6).

The Frick et al. (1991) study developed a definition of agricultural literacy by consensus of 78 individuals representing agriculture and education. Based on 11 broad agricultural concepts, their consensus definition of agricultural literacy was

Agricultural literacy can be defined as possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture. Basic agricultural information includes: the production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture’s important relationship with natural resources and the environment, the marketing of agricultural products, the processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. (p. 52)

In summary, agricultural literacy has been synonymous with the term agricultural awareness and defined as “having knowledge and competency in agriculture” (Deeds, 1991, p. 11). Agricultural literacy also included an awareness of the impact agriculture has on society, the environment, and on every individual (Brown, 1991; Law & Pepple, 1990).
The Importance of Agricultural Literacy

The basic purpose of agricultural literacy efforts has been to produce informed citizens who have an "awareness and understanding of the significance of agriculture to the lives of all people" (Russell et al., 1990, p. 13). Hamlin (1962) made reference to agricultural literacy as early as 1962 by pointing out the great need for a knowledgeable citizenry of agriculture. Hamlin (1962) suggested the agricultural industry could be damaged by a citizenry illiterate about agriculture. Birkenholz (1990) stated, "An educated citizenry is needed to ensure the preservation of the industry which produces the food needed to satisfy the most basic of human needs" (p. 5). Russell et al. (1990) came to a similar conclusion when they stated, "Every citizen of the United States should possess a basic understanding of agriculture" (p. 13).

Mawby (1985) wrote,

Few issues are of greater importance to the world than adequate food supplies, proper food use, and knowledge about the components of the agriculture industry. Yet today most people, including those in key positions of public decision-making, do not understand the complexities of America's food system; nor do they fully comprehend its relationship to human nutrition. (p. 7)

At the request of the United States Secretary of Agriculture and Secretary of Education, the National Research Council (1988) established a Committee on Agricultural Education in Secondary Schools. Their report entitled
Understanding Agriculture: New Directions for Education focused on education in and about agriculture. The report defined in agriculture as dealing with preparing students for careers in agriculture and about agriculture as dealing with the concepts of agricultural literacy. The National Research Council's (1988) two major findings were (a) “Most Americans know very little about agriculture, its social and economic significance in the United States, and particularly its links to human health and environmental quality” and (b) “Few systematic educational efforts are made to teach or otherwise develop agricultural literacy in students of any age” (p. 9). The National Research Council (1988) also stated, “agriculture - broadly defined - is too important a topic to be taught only to the relatively small percentage of students considering a career in agriculture” (p. 8). The National Research Council (1988) recommended, “beginning in kindergarten and continuing through twelfth grade, all students should receive some systematic instruction about agriculture” (p. 2). For this to occur, education leaders needed to integrate agricultural concepts into existing curricula of students at all ages.

Horn and Vining (1986) measured basic agricultural knowledge of 2,000 elementary, junior, and senior high school students in Kansas. The study found fewer than 30% of the students sampled could answer basic agricultural literacy questions correctly. This study showed that much needed to be done in the field of agricultural literacy.
In a study of agricultural literacy in Oklahoma, Williams and White (1991) found that students in the fifth, eighth, and eleventh grades possessed "low" levels of basic agricultural knowledge. Russell et al. (1990) reported that fewer than 5% of high school students in America were enrolled in agricultural education courses. Birkenholz (1990) stated, "There is a tremendous need to prepare students to become informed citizens with the capacity to make intelligent decisions regarding agriculture, food, and fiber production" (p. 13).

Perey (1989), in a study of agricultural literacy in Arizona rural high schools, found students also lacked a basic understanding of agriculture as related to agricultural terms. Perey's (1989) most significant finding was that students enrolled in agricultural education were no more agriculturally literate than students not enrolled in agricultural education. It was suggested that new curricula and delivery methods be implemented to develop a citizenry which possessed basic agricultural knowledge. Law (1990) wrote, "Vital to the continued success of this industry, and the nation as a whole, is a well informed literate society with regard to knowledge about agriculture" (p. 5).

The importance of agricultural literacy has been widespread, with its underlying purpose of producing informed citizens who can make wise decisions about issues and policies concerning agriculture or who can more adequately participate in the establishment of agricultural policies (Birkenholz, Frick, Gartin, Hoover, Jewell, Terry, Bishop, & Stewart; 1992). Mawby (1984) stated, "Many negative decisions affecting food production can be traced to a general lack of
understanding of agriculture” (p. 72). Tisdale (1991) believed an agriculturally literate public could then face agricultural issues such as food safety, pesticide use, waste management, and genetic engineering with at least a basic knowledge of agriculture.

Birkenholz et al. (1993) wrote, “it is imperative that every citizen develop a basic understanding of and appreciation for the industry of agriculture” and “to do less would place unnecessary risk on the industry which is so vital to our future well-being” (p. iv).

There is no question the agricultural industry has been vital to our existence and to our survival. The food and fiber industry has affected us directly by providing nourishment, shelter, clothing, and good health and indirectly by stimulating our economy, international trade, and global relations (USDA, 1983). Yet, because of the large urban population, many Americans have rarely understood agriculture’s importance and significance to their own lives and have taken agriculture for granted. Many studies have suggested and documented that American students are limited in their knowledge about agriculture (Horn & Vining, 1986; Oliver, 1986; Perey, 1989; Williams & White, 1991; Wright, 1992). Fewer and fewer Americans have had direct contact with agriculture due to declining numbers involved in production agriculture, and thus has brought a decline in agricultural knowledge and a change in attitude toward the food and fiber industry.
The Changing Knowledge and Perception Toward Agriculture

Agriculture has long been recognized as the backbone of America. It has contributed heavily to the history of the United States, to the quality of life for America’s citizens, and to the economic well-being of the nation (Russell et al., 1990). In 1996, agriculture employed 22 million people in the United States - the nation’s largest employer, while contributing $185.7 billion to the economy (American Farm Bureau Federation, 1997). However, agriculture has been an ever-changing industry. Technological advancements over the years, such as Global Positioning Systems and biotechnology, have made the American farmer more productive and efficient in food and fiber production. This has allowed Americans to spend an average of 10.9% of their income on food - the lowest in the world (American Farm Bureau Federation, 1997). Also with each passing generation, fewer and fewer Americans have been directly involved in production agriculture (Flood & Elliot, 1994). This decline has undoubtedly brought about a decline in agricultural knowledge and perception toward agriculture (Wright, 1992). The likely threat to society has been viewed as real when so many lack a fundamental cognizance of the agricultural industry, including its significance and importance to all.

Schlink (1997) noted that less than 2% of the nation’s working population were employed in production agriculture, while Tisdale (1991) reported production agriculturists were outnumbered in the general population by more than 40 to 1. Law and Pepple (1990) stated, “The transformation of American
society from primarily rural to primarily urban has resulted in the average citizen knowing very little or nothing about agriculture” (p. 10). Yet, it has been reported that greater than 20% of all occupations are agriculturally related due in part that “agriculture in America is a broad-based growing industry which employs individuals in virtually every community in the nation” (Law, 1990, p. 5).

Not only has agricultural knowledge declined in American society, but public perception of agriculture as well. The lack of agricultural awareness in American society has been directly related to the continued negative perception toward the agricultural industry. Birkenholz et al. (1993) stated, “Although direct involvement in production agriculture has declined, increasing numbers of citizens in this country have become more vocal about issues related to agriculture, food, and natural resources” (p. 2). Mawby (1984) wrote, “Despite agriculture’s demonstrated environmental stewardship, it is often seen as a villain and is on the defensive” (p. 72). Birkenholz et al. (1993) stated, “public beliefs, attitudes, and actions have often resulted from biased or inaccurate information” (p. 2). It has been reported that most Americans still associate agriculture exclusively with “farming” (National Research Council, 1988; Russell et al., 1990; Wright, 1992). A citizenry educated with a minimum level of agricultural knowledge has been viewed as necessary for a continued strong and successful agricultural industry.

With the changing knowledge and perception toward agriculture, an important area concerning agriculture has been policy development. Nipp (1988) stated
that there was an increasing number of politicians who analyze issues, policies, and questions concerning agriculture from the perspective of a consumer rather than a producer. A majority of state and national legislatures involved in agricultural policy development have limited or no agricultural backgrounds or experiences (Birkenholz et al., 1992; Nipp, 1988). The fear of many has been that future decisions made without consideration of agriculture may have long-lasting, even devastating effects on agricultural productivity in this country” (Birkenholz et al., 1992, p.4). North Carolina State University, in their 1988 summary of Agricultural and Rural Viability (1988), reported,

Everyday, decisions are being made that affect the viability of rural America as a place to work and live. Unfortunately, they are being made without adequate knowledge of the social and economic processes affecting agriculture and rural communities. A much better understanding of these processes is necessary to maintain and improve life in rural America, to increase income, and to secure jobs for the future. (p. v)

Law and Peppe (1990) stated, “America cannot afford the consequences of individuals with little or no agricultural knowledge making policy decisions affecting our food and fiber supply” (p. 10).

More and more issues concerning agriculture such as environmental quality, animal rights, water and soil conservation, and BST have caused public outcry and reaction in the recent past. As agricultural issues gain more importance in the future, “...it becomes even more important that the general public have some
background and understanding of not only what agriculture is all about, but how it affects each person’s life on a daily basis” (Law, 1990, p. 5). The changing perception toward agriculture and the lack of agricultural knowledge has showed the need for every citizen to increase their literacy and understanding of the food and fiber industry.

**Increasing Agricultural Literacy**

A critical factor influencing the decline of agricultural literacy in the nation has been the lack of emphasis placed on it in education (Balshweid, Thompson, & Cole, 1998). Wright (1992) described the great need for increasing agricultural literacy if the agricultural industry is to remain successful in American society. Russell et al. (1990) pointed out the importance of increasing awareness toward agriculture and stated, “Agricultural literacy programs should be targeted at all youth - particularly school age youth at all grade levels - and adults” (p. 14).

Swan (1991) believed agriculture to be too significant to only be offered to a small percentage of students in America. Russell et al. (1990) made a similar conclusion when they said too few students were enrolled in both high school agricultural education and non-formal elementary agricultural education programs such as Agriculture in the Classroom and Food For America. The National Research Council’s (1988) Committee on Agricultural Education in Secondary Schools stated the focus of agricultural education must be expanded to include a much larger audience than before. Traditionally, secondary
agricultural education programs were targeted at youth interested in agriculture as an occupation. With the declining numbers involved in production agriculture, secondary agricultural education programs were no longer needed to teach students how to farm. A shift in secondary agricultural education occurred to prepare students for agricultural careers and make them more agriculturally literate to accommodate the larger non-farm audience.

Many studies have concluded that elementary school children know very little about the food and fiber industry (National Research Council, 1988). For more than a decade, educators have advocated the integration of agricultural concepts into elementary curriculum (Frick, Birkenholz, & Machmets, 1995; National Research Council, 1988; Tresler & Miller, 1992). Two efforts established to increase agricultural literacy among elementary school children were Agriculture in the Classroom and Food For America. Agriculture in the Classroom began in 1981, as a joint venture between the United States Department of Agriculture and the United States Department of Education to bring agricultural awareness to students in grades K through 12. It has been one of the most successful, extensively used agricultural literacy efforts in America, which incorporated agricultural concepts into existing curriculum and classroom activities (Williams, 1990). Its goal has been to encourage educators to teach and incorporate more agricultural information and concepts into existing curriculum in elementary and secondary schools.
Food For America has been another very successful agricultural literacy program which was initiated in 1975 by the National FFA Organization. Stagg (1991) said this program "was one of the first national efforts to teach young students about the business of food and fiber" (p. 14). The Food For America program has offered elementary students in grades 1 through 6 the opportunity to learn from FFA members the importance of the agricultural industry and the significant role it has played in their lives. Food For America has been FFA's most popular program with 40% of all chapters across America participating, which has allowed nearly 3,000 FFA chapters across the nation to bring agricultural awareness to elementary students (Traxler, 1992).

The 4-H program, a component of the Cooperative Extension Service of the United States Department of Agriculture, was established as a non-formal, educational, youth development program to youth ages 5 to 19. The 4-H program has offered the development of life skills and learning experiences through more than 200 project areas, many of which are related to the food and fiber industry. Ohio 4-H has been one of the largest, most comprehensive 4-H Youth Development Program in the United States and coordinated through The Ohio State University Extension (Ohio State University Extension, 1996). More than 200,000 youth in Ohio were involved in 4-H Youth Development programs in 1996.

An agricultural literacy effort in Ohio to make fourth grade children more aware of the importance and significance of Ohio agriculture has been Ag
Venture Magazine. Developed in 1992 through support of the Ohio Agricultural Council; The Ohio State University Extension; The College of Food, Agricultural, and Environmental Sciences; and Ohio's agricultural community, Ag Venture Magazine has provided agricultural awareness to fourth grade students through agricultural concepts and hand-on activities. Ag Venture Magazine has been published three times a year with each issue discussing a particular theme with the aim of increasing agricultural awareness in Ohio's fourth grade youth.

Many researchers have noted the drastic need for curriculum changes in agricultural education to accommodate the changing audience. Today's students and tomorrow's leaders cannot be expected to hold an understanding of agriculture when it has mostly been disregarded in the curriculum (Birkenholz et al., 1992). Frick (1988) believed that "the introduction of agricultural literacy courses into high school curricula can strengthen a student's awareness of agriculture's important position in our world" (p. 13). Law and Pepple (1990) believed a systematic infusion of agricultural literacy concepts into existing curricula such as math and science would bring the needed agricultural awareness to students.

Pre-secondary agricultural education, such as seventh or eighth grade agricultural education, has been an area of great interest. These programs have offered students knowledge and experience in agriculture as well as exposing them to the many career possibilities in agriculture before they get to high school. The National Research Council (1988) noted in their report
Understanding Agriculture: New Directions for Education many students make their first decisions about career possibilities before even entering high school and students needed to be aware of career possibilities. Townsend (1990) believed pre-secondary agricultural education can offer students much success by exposing them to agricultural careers and providing leadership, self-confidence, and positive experiences earlier in their development.

Osborne (1992) noted that agriculture must find its place in elementary education so the children of the 21st Century can be knowledgeable about agriculture and understand how it affects them. Osborne (1992) believed we must educate elementary children about agriculture so they may get the right messages about agriculture, before they form their own opinions based on society's misinformation. Others have recognized the situation of America's agricultural illiterate youth, such as the W.K. Kellogg Foundation, and have been helping to incorporate agricultural concepts into the liberal arts undergraduate curricula in universities across the nation (Douglass, 1985). The goal has been to increase the understanding and awareness of undergraduates and faculty about agriculture's significance and importance to themselves and the world (Douglass, 1985). Mawby (1984) described the role of land grant colleges and universities in educating the non-farm population about agriculture and stated, A variety of institutions can play a role in shaping the direction of American agriculture, but none is more qualified than the land grant colleges of agriculture, with their unique tradition of research, teaching, and extension.
Taken collectively, these institutions can educate or influence both the people and the processes affecting the future of agriculture. (p. 72)

The increasing of agricultural literacy in the people of all ages must be a combination of many efforts and groups. The article, “Strategies to Promote Agricultural Literacy” by Birkenholz et al. (1992), identified key groups which could have direct impacts on increasing agricultural literacy. The groups included:

- Agricultural Educators
- Public Schools
- FFA Alumni Groups
- Agricultural Industry
- Agricultural Magazines
- Colleges of Agriculture
- Commodity Groups
- Special Interest Groups
- General Agriculture Organizations
- Agricultural Extension
- Agricultural Education Advisory Committees
- FFA, PALS, Young Farmers/Young Farm Wives
- Government Agencies (USDA, SCS, ASCS) (p. 13)
Thus, an expanded elementary agricultural education effort, a more inclusive pre-secondary and secondary agricultural education, and the contribution of key groups and individuals could brighten the future of agricultural literacy.

The Future of Agricultural Literacy

So, what about the future of agricultural literacy? It is a fact, the future will be sure to provide us with more and more people that are agriculturally illiterate. Changes in production agriculture and agricultural education and our changing audience have caused much concern and debate about agricultural literacy. Law and Pepple (1990) stated,

The challenge for agricultural education today is to somehow help the average citizen recognize that everyone’s well-being, from the producer on the farm to the commodity traders in Chicago to the consumer, is in some way affected by the vast food and fiber system, and therefore in need of an understanding of some basic agricultural literacy concepts. (p. 10)

Mawby (1984) believed future decisions in agriculture can be made more wisely and carefully when Americans are educated in the food and fiber industry.

Deeds (1991) believed some view agricultural literacy as those pre-secondary and secondary programs where students choose to be educated in and about agriculture. Deeds (1991) also saw others viewing agricultural literacy as those elementary agricultural education programs such as Agriculture in the Classroom and Food For America. Still, others saw agricultural literacy as an integration of
agricultural concepts into all general education curricula (Deeds, 1991; Zurbrick, 1990). Whatever the view of agricultural literacy, Birkenholz et al. (1992) believed increasing education in and about agriculture in the future “will require a multi-dimensional effort” (p. 16). Russell et al. (1990) believed schools and government programs and agencies must take the responsibility in educating the citizenry about the role and significance agriculture plays in society.

Just as agriculture has changed, so too must pre-secondary and secondary agricultural education. The expansion of agricultural education and the elementary agricultural literacy programs have undoubtedly increased awareness in agriculture by reaching more people. However, all organizations, institutions, businesses, companies, commodity groups, and the like involved in the agricultural industry have to assume the role of educating the citizenry to be knowledgeable about the food and fiber industry. Only in this way can we ensure a larger percentage of the general population is knowledgeable about agriculture and be “able to participate in establishing the policies that will support a competitive agricultural industry in this country and abroad” (National Research Council, 1988, p. 2).

**Summary**

Russell et al. (1990) stated, “The problem of agricultural literacy is widespread, having serious ramifications in the arenas of public policy development, development of personnel to serve the broad agricultural industry,
and in the education of our people from kindergarten through adult levels (p. 13). With the impact of technology such as computers, growth hormones, and genetic engineering, and the decreasing numbers of people directly involved in production agriculture, many Americans do not understand the agricultural industry and its significance. The lack of agricultural knowledge has led to public misunderstanding and misinformation in many agricultural issues, such as pesticide use and the safety of our food supply, which can have serious effects on society (Birkenholz & Craven, 1996). The public attitude toward agriculture has declined due to the lack of agricultural knowledge. Agricultural issues such as animal rights, waste management, and environmental quality have given people a negative attitude toward agriculture.

Only education in and about the agricultural industry will save our communities and our nation. Thus, it is vital to determine the level of knowledge that exists and the perception toward agriculture which students have. With this information, one can determine what needs to be done in the field of agricultural literacy to further educate Americans about agriculture. Frick and Spotanski (1990) summed it up when they stated, “Agricultural literacy is important to the future of our nation and the discipline of agriculture” (p. 13).

**Rationale for a Study on Agricultural Literacy in Ohio**

Study after study has suggested and documented that American students are limited in their knowledge about agriculture (Horn & Vining, 1986; Oliver, 1986;
Perey, 1989; Williams & White, 1991; Wright, 1992). In addition, numerous studies have noted the drastic effects to society when a citizenry is agriculturally illiterate (Law & Pepple, 1990; Mawby, 1984; Nipp, 1988). However, no study has assessed agricultural literacy of high school students in Ohio. Would Ohio students be more or less knowledgeable of the agricultural industry compared to studies in other states? Ohio is the seventh most populous state with 11.2 million persons and one of the most urbanized agricultural states in the nation. Agriculture contributed more than $67 billion to Ohio's economy and employed one in every six persons in 1998, making agriculture Ohio's number one industry. Thus, an assessment of the agricultural awareness of Ohio's school students seems warranted.

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. Are agricultural students more agriculturally literate than students not enrolled in an agricultural program? Is the agricultural knowledge and perception toward agriculture
different between students not enrolled in agricultural education in schools with agriculture and students in schools without agriculture?

This study was based on a similar study conducted in Missouri in 1992. Wright (1992) assessed the agricultural awareness of eleventh grade students in Missouri schools with and without a secondary agricultural education program. The Missouri schools sampled had less than 250 students in the high school and were not located in a population center of more than 50,000 persons. Wright (1992) found a significant difference existing on knowledge scores and perception scores between agricultural education students and students not enrolled in a secondary agricultural education program. Wright (1992) concluded students enrolled in a secondary agricultural program were more knowledgeable in agriculture and had a more positive perception toward the industry.
CHAPTER 3

METHODOLOGY

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. This chapter describes the methodology used to carry out this study on agricultural literacy. The methodology is organized by the following sections: research design, population and sampling, instrumentation, data collection, and data analysis.

Research Design

The design for this study on agricultural literacy was ex post facto. An ex post facto design was used to answer the research questions of this study by
testing statistical hypotheses. The design allowed the researcher to begin with the measurement of the dependent variables and then explain variability in terms of the independent variables. The dependent variables in this study were (a) agricultural knowledge, and (b) perception toward agriculture, which were represented by scores on the Agricultural Awareness Instrument.

The independent variables in this study were students in the following groups: (a) eleventh grade students enrolled in agricultural education in schools with a secondary agricultural education program, (b) eleventh grade students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) eleventh grade students in schools without a secondary agricultural education program. Other independent variables that could contribute to the students' agricultural awareness were those demographic items listed in the personal information section of the Agricultural Awareness Instrument. They included the following:

1) gender (male, female)
2) home location (farm, rural area, town/city)
3) population of hometown or town nearest home (under 2,500; 2,501-10,000; 10,001-25,000; 25,001-100,000; over 100,000)
4) have relatives who live or work on a farm (yes, no)
5) have relatives who work in an agricultural business (yes, no)
6) how many acres on farm (don’t live on a farm, less than 50 acres, 51-200 acres, 201-750, over 750)

7) enrolled in agricultural education (yes, no)

8) years of agricultural courses in high school (never, less than 1 year, 1 year, 2 years, 3 years, 4 years)

9) member of the FFA (yes, no)

10) member of 4-H (yes, no)

11) raise animals or pets (yes, no)

12) raise plants, gardens, or crops (yes, no)

13) read news magazines most regularly (yes, no)

14) read newspapers most regularly (yes, no)

15) listen to radio news most regularly (yes, no)

16) watch television news most regularly (yes, no)

17) get news from internet most regularly (yes, no)

Survey research methods were used to collect the data using mailed questionnaires. According to Miller (1998), survey research methods which involve mailed questionnaires to subjects can produce error which will effect the external validity of a study. The procedures used to avoid these potential threats to external validity will be explained in later sections of this chapter.
Population and Sample

The target population for this study was students in the eleventh grade in all public secondary schools in Ohio, which were located in counties with less than 200,000 persons as identified by the 1990 U.S. Census. Eleventh grade students were selected to participate in the study for several reasons. They were nearing the end of their high school career and would be expected to further their education or gain employment; they have had an opportunity to learn about agriculture; the senior syndrome was avoided; and other studies on agricultural literacy included eleventh grade students (Williams & White, 1991; Wright, 1992).

A random sample of eleventh grade students from the population was needed. It was not feasible to obtain a complete frame of all eleventh grade students in Ohio public secondary education schools in counties less than 200,000 persons. Therefore, an alphabetical list of Ohio counties was obtained with 12 urbanized counties with populations greater than 200,000 persons excluded. A population of 200,000 served as the cutoff between urban and rural Ohio schools. It was decided by the researcher to use rural Ohio schools because urban counties had too few schools with secondary agricultural education programs from which to select. Twenty counties were systematically randomly sampled from an alphabetical list of Ohio counties. Twenty counties were used to conserve fiscal resources and still provide for statistical power.
A list of all secondary schools within the selected counties was obtained from the Ohio Department of Education. A sample of schools with and without a secondary agricultural education program was needed. Using the 1998-1999 Ohio Agricultural Education Directory, the list of schools was stratified into schools with a secondary agricultural education program and schools without a secondary agricultural education program. A list of 20 schools with a secondary agricultural education program and 20 schools without a secondary agricultural education program was systematically randomly sampled as well as 10 schools in each group to serve as replacements (Appendix A). Replacement schools were selected in each group to replace those schools who chose not to participate in the study. Several of the participating schools were from the replacement list; three schools with agriculture and four schools without agriculture. A total of 40 schools in Ohio agreed to participate in this study on agricultural literacy. School principals were contacted by telephone to ask for participation in the study. The principals of the 20 schools with an agricultural education program were asked to administer the Agricultural Awareness Instrument to one randomly selected eleventh grade class as well as the eleventh grade students enrolled in agricultural education. The principals of the 20 schools without an agricultural education program were asked to administer the Agricultural Awareness Instrument to one randomly selected eleventh grade class within the high school.
The four major threats to external validity that could provide sources for error when using mailed questionnaires were frame error, sampling error, selection error, and non-response error. To control for frame error, a current listing of Ohio rural secondary schools was obtained from the Ohio Department of Education and the most current Ohio Agricultural Education Directory was utilized when selecting schools for the study. The Ohio Department of Education gave assurances that the lists obtained were accurate and up to date.

Sampling error was controlled using a systematic random sampling technique to obtain a probabilistic sample of the population (Ary, Jacobs, & Razavieh; 1996).

Selection error was controlled by purging the lists from the Ohio Department of Education to find names of duplicate schools.

Non-response error was not addressed in this study. Before data entry, each instrument was assessed for completeness, mistreatment of items, and obvious lying. Instruments with more than five total unanswered items in Part I (agricultural knowledge) and Part II (perception toward agriculture) were considered invalid and not used.

Instrumentation

The instrument used for this study of agricultural literacy was based on the Agricultural Awareness Survey (1992), which was developed by the Agricultural
Education faculty and graduate students at the University of Missouri-Columbia. The Agricultural Awareness Survey (1992) contained seven concept areas identified by Frick (1991) that included the following: societal and global significance, agricultural policies and economic impact, natural resources, plants, animals, processing, and marketing.

The Agricultural Awareness Instrument used for this study consisted of three parts: knowledge of agriculture, perception toward agriculture, and personal information (Appendix B). Part I contained 35 agricultural knowledge items that required respondents to answer: true, false, or don't know. Respondents answering “don't know” to items in Part I were considered incorrect. Part II contained 35 attitude items that required respondents to use a five-point Lickert-type scale ranging from five to one, strongly agree to strongly disagree. Part III contained the following 18 demographic information items.

1) gender (male, female)

2) home location (farm, rural area, town/city)

3) population of hometown or town nearest home (under 2,500; 2,501-10,000; 10,001-25,000; 25,001-100,000; over 100,000)

4) have relatives who live or work on a farm (yes, no)

5) have relatives who work in an agricultural business (yes, no)

6) how many acres on farm (don’t live on a farm, less than 50 acres, 51-200 acres, 201-750, over 750)
7) enrolled in agricultural education (yes, no)

8) years of agricultural courses in high school (never, less than 1 year, 1 year, 2 years, 3 years, 4 years)

9) member of the FFA (yes, no)

10) member of 4-H (yes, no)

11) raise animals or pets (yes, no)

12) raise plants, gardens, or crops (yes, no)

13) grade level (freshman, sophomore, junior, senior)

14) read news magazines most regularly (yes, no)

15) read newspapers most regularly (yes, no)

16) listen to radio news most regularly (yes, no)

17) watch television news most regularly (yes, no)

18) get news from internet most regularly (yes, no)

To establish validity of the instrument for this study, a panel of experts was used to establish content and face validity. The panel of experts consisted of two professors of Agricultural Education at The Ohio State University, one secondary agricultural instructor, and two doctoral graduate students in the Department of Human and Community Resource Development at The Ohio State University (Appendix C). Following a review of the instrument, recommendations such as general wording, layout, and format were provided by the panel of experts and incorporated into the instrument.
The Agricultural Awareness Instrument was pilot tested for reliability using a school not selected for the study. Internal consistency for Part I and Part II was calculated. Cronbach's alpha coefficient for the knowledge section was .90. Cronbach's alpha coefficient for the perception section was .81.

A summary of the study including all letters to school principals and a copy of the instrument were submitted to the Office of Research Risks Protection, Human Subjects Institutional Review Board at The Ohio State University. The study was approved on the following conditions: that an information sheet be provided to the parents of each eleventh grade student and the following statement to be placed on the back of the instrument: "By answering this questionnaire and handing it in, you are implying informed consent."

**Data Collection**

The data for this study was collected using the Agricultural Awareness Instrument. School principals in participating schools were sent the Agricultural Awareness Instrument on January 4, 1999 to be administered to eleventh grade students and returned January 29, 1999. The principals in the 20 schools with an agricultural education program were asked to administer the Agricultural Awareness Instrument to one randomly selected eleventh grade class as well as all eleventh grade students enrolled in agricultural education. These schools were sent a package that included 40 Agricultural Awareness Instruments, 40
parental information sheets required by the Human Subjects Institutional Review Board (Appendix E), a stamped self addressed envelope for returning the instruments, and a letter addressed to the principal explaining the study (Appendix F). The letter to the principal addressed the purpose of the study, the study's confidentiality and the students' anonymity, and procedures for administering the instruments. The principals in the 20 schools without an agricultural education program were asked to administer the Agricultural Awareness Instrument to one randomly selected eleventh grade class within the high school. These schools were sent a package that included 25 Agricultural Awareness Instruments, 25 parental information sheets required by the Human Subjects Institutional Review Board, a stamped self addressed envelope for returning the instruments, and a letter addressed to the principal explaining the study (Appendix G). The letter to the principal addressed the purpose of the study, the study's confidentiality and the students' anonymity, and procedures for administering the instruments. The Agricultural Awareness Instruments were coded by school to assist with non-response follow-up.

Three weeks after the initial mailing of the instruments, a telephone call reminder was made to the principals who had not returned the completed instruments. The importance of the school's participation was emphasized and packages were resent to six schools not receiving them on the first mailing.
Additional telephone calls, as many as six to some schools, were made to remind the principals to return the Agricultural Awareness Instruments.

Of the 20 schools with a secondary agricultural education program, 17 schools returned them for a response rate of 85%. Of the 20 schools without a secondary agricultural education program, 15 schools returned them for a response rate of 75%. A combined response rate of 80% was achieved.

**Data Analysis**

The data collected were analyzed using the Statistical Package for the Social Sciences (SPSS), version 8.0. The alpha level was established *a priori* at .05. Appropriate descriptive and inferential statistics were utilized to answer the research questions posed in the study.
CHAPTER 4

FINDINGS

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. The findings are organized in this chapter in the following sections: description of respondents, agricultural knowledge, perception toward agriculture, and the relationship between selected demographic variables and agricultural knowledge and perception toward agriculture.

Description of Respondents

The principals of 15 randomly selected schools without an agricultural education program administered the Agricultural Awareness Instrument to one
randomly selected eleventh grade class within the high school. The principals of 17 randomly selected schools with an agricultural education program administered the Agricultural Awareness Instrument to one randomly selected eleventh grade class as well as the eleventh grade students enrolled in their school's agricultural education program. Frequency and percent of responses to the demographic items for the groups of students who participated in the study are provided in Table 1 and Table 2.

Students in Schools without a Secondary Agricultural Education Program

Approximately 52% of the students in schools without a secondary agricultural education program were female, 53% lived in a town or city, and 32% of the respondents' hometown or town nearest them had a population less than 2,500. Approximately 85% of the respondents did not live on a farm, 52% reported having relatives who lived or worked on a farm, and 40% of the respondents reported having relatives who worked in an agricultural business. Approximately 92% of the respondents reported having never been in agricultural education, 3% had been an FFA member, and 24% had been a member of 4-H. Approximately 80% of the respondents had raised animals or pets and 65% had raised plants, gardens, or crops. Frequency and percent of responses to the types of news sources used most regularly are reported in
<table>
<thead>
<tr>
<th>Demographic</th>
<th>Freq</th>
<th>%</th>
<th>Freq</th>
<th>%</th>
<th>Freq</th>
<th>%</th>
</tr>
</thead>
<tbody>
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<td>In schools without agricultural</td>
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<td></td>
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<td>education</td>
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<tr>
<td>Male</td>
<td>140</td>
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<td>Under 2,500</td>
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<td>2,501–10,000</td>
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<td>25,001–100,000</td>
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<td>18.3</td>
<td>9</td>
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<td>Over 100,000</td>
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<td>on a farm?</td>
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<td>157</td>
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<td>35</td>
<td>18.2</td>
<td>88</td>
<td>37.6</td>
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Table 1: Frequency and percent of responses to the demographic items for the groups of students participating in the study.

(To be continued)
Table 1 (continued)

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<th>Demographic</th>
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<th>Enrolled in agricultural education in ag. schools</th>
<th>Not enrolled in agricultural education in ag. schools</th>
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<tr>
<td>Have relatives who work in an ag. business?</td>
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<td></td>
<td>60.0</td>
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<td>How many acres on farm?</td>
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<td></td>
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<td>Don’t live on farm</td>
<td>245</td>
<td>103</td>
<td>198</td>
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<tr>
<td></td>
<td>84.5</td>
<td>53.6</td>
<td>84.6</td>
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<td>Less than 50</td>
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<td>11</td>
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<tr>
<td></td>
<td>3.4</td>
<td>13.0</td>
<td>4.7</td>
</tr>
<tr>
<td>51-200 acres</td>
<td>23</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>7.9</td>
<td>10.4</td>
<td>4.7</td>
</tr>
<tr>
<td>201-750 acres</td>
<td>9</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>3.1</td>
<td>8.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Over 750 acres</td>
<td>3</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1.0</td>
<td>14.6</td>
<td>3.4</td>
</tr>
<tr>
<td>Years of ag. ed.?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>266</td>
<td>1</td>
<td>209</td>
</tr>
<tr>
<td></td>
<td>91.7</td>
<td>.5</td>
<td>89.3</td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>11</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3.8</td>
<td>6.8</td>
<td>0</td>
</tr>
<tr>
<td>1 year</td>
<td>4</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
<td>9.9</td>
<td>6.4</td>
</tr>
<tr>
<td>2 years</td>
<td>2</td>
<td>46</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>.7</td>
<td>24.0</td>
<td>4.3</td>
</tr>
<tr>
<td>3 years</td>
<td>7</td>
<td>113</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2.4</td>
<td>58.9</td>
<td>0</td>
</tr>
</tbody>
</table>

(To be continued)
Table 1: Frequency and percent of responses to the demographic items for the groups of students participating in the study.

<table>
<thead>
<tr>
<th>Demographic</th>
<th>In schools without agricultural education</th>
<th>Enrolled in agricultural education in ag. schools</th>
<th>Not enrolled in agricultural education in ag. schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you been a member of FFA?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 3.1</td>
<td>187 97.4</td>
<td>20 8.5</td>
</tr>
<tr>
<td>No</td>
<td>281 96.9</td>
<td>5 2.6</td>
<td>214 91.5</td>
</tr>
<tr>
<td>Have you been a member of 4-H?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>70 24.1</td>
<td>103 53.6</td>
<td>81 34.6</td>
</tr>
<tr>
<td>No</td>
<td>220 75.9</td>
<td>89 46.4</td>
<td>153 65.4</td>
</tr>
<tr>
<td>Have you raised animals or pets?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>233 80.3</td>
<td>180 93.8</td>
<td>191 81.6</td>
</tr>
<tr>
<td>No</td>
<td>57 19.7</td>
<td>12 6.3</td>
<td>43 18.4</td>
</tr>
<tr>
<td>Have you raised plants, gardens, or crops?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>190 65.5</td>
<td>160 83.3</td>
<td>161 68.8</td>
</tr>
<tr>
<td>No</td>
<td>100 34.5</td>
<td>32 16.7</td>
<td>73 31.2</td>
</tr>
<tr>
<td>Demographic</td>
<td>In schools without agricultural education</td>
<td>Enrolled in agricultural education in ag. schools</td>
<td>Not enrolled in agricultural education in ag. schools</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Freq</td>
<td>%</td>
<td>Freq</td>
</tr>
<tr>
<td>Which of the following news sources do you use regularly?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>News magazines</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>124</td>
<td>42.8</td>
<td>107</td>
</tr>
<tr>
<td>No</td>
<td>166</td>
<td>57.2</td>
<td>85</td>
</tr>
<tr>
<td>Newspapers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>217</td>
<td>74.8</td>
<td>160</td>
</tr>
<tr>
<td>No</td>
<td>73</td>
<td>25.2</td>
<td>32</td>
</tr>
<tr>
<td>Radio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>265</td>
<td>91.4</td>
<td>197</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>8.6</td>
<td>13</td>
</tr>
<tr>
<td>Television</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>277</td>
<td>95.5</td>
<td>182</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td>4.5</td>
<td>10</td>
</tr>
<tr>
<td>Internet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>181</td>
<td>62.4</td>
<td>120</td>
</tr>
<tr>
<td>No</td>
<td>109</td>
<td>37.6</td>
<td>72</td>
</tr>
</tbody>
</table>

Table 2: Frequency and percent of responses to the types of news sources used most regularly for the groups of students participating in the study.
Table 2. Students in schools without agricultural education reported that television and radio were used most frequently with 95% and 91% respectively, followed by newspapers (75%), internet (62%), and news magazines (43%).

**Students Enrolled in Agricultural Education in Schools with Secondary Agricultural Education Programs**

Approximately 73% of the students enrolled in agricultural education in schools with secondary agricultural education programs were male, 81% of the respondents' homes were located either on a farm or in a rural area, and 50% of the respondents' hometown or town nearest them had a population less than 2,500. Approximately 46% of the respondents lived on a farm, 82% reported having relatives who lived or worked on a farm, and 90% of the respondents reported having relatives who worked in an agricultural business. Approximately 59% of the respondents reported having been enrolled in three years of agricultural education, 98% had been an FFA member, and 54% had been a member of 4-H. Approximately 94% of the respondents had raised animals or pets and 83% had raised plants, gardens, or crops. Frequency and percent of responses to the types of news sources used most regularly are reported in Table 2. Students enrolled in agricultural education in schools with secondary agricultural education programs reported that television and radio were used
most frequently with 95% and 93% respectively, followed by newspapers (83%), internet (62%), and news magazines (56%).

**Students not Enrolled in Agricultural Education in Schools with Secondary Agricultural Education Programs**

Approximately 51% of the students not enrolled in agricultural education in schools with secondary agricultural education programs were female, 48% of the respondents' homes were located in a rural area, and 43% of the respondents' hometown or town nearest them had a population less than 2,500. Approximately 85% of the respondents did not live on a farm, 62% reported having relatives who lived or worked on a farm, and 51% of the respondents reported having relatives who worked in an agricultural business. Approximately 90% of the respondents reported having never been enrolled in agricultural education, 8% had been an FFA member, and 35% had been a member of 4-H. Approximately 82% of the respondents had raised animals or pets and 69% had raised plants, gardens, or crops. Frequency and percent of responses to the types of news sources used most regularly are reported in Table 2. Students not enrolled in agricultural education in schools with secondary agricultural education programs reported that television and radio were used most frequently with 95% and 91% respectively, followed by newspapers (81%), internet (60%), and news magazines (44%).
Summary of Demographic Differences

The greatest differences among the groups of students were found with those students enrolled in agricultural education in schools with secondary agricultural education programs. In this group, 73% were male, 35% lived on a farm, 82% had relatives who lived or worked on a farm, and approximately 80% had relatives who worked in an agricultural business. Other major differences among the same group of students were 54% had been a member of 4-H, 94% reported having raised animals or pets, and 83% had raised plants, gardens, or crops?

Agricultural Knowledge

Research questions were developed to determine if statistically significant differences existed among the mean scores for agricultural knowledge of eleventh grade students in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. The scores for agricultural knowledge were obtained from correct responses to Part I of the Agricultural Awareness Instrument.

Descriptive statistics related to agricultural knowledge of the eleventh grade students in the study are reported in Table 3. The students who were enrolled in
agricultural education in schools with a secondary agricultural education program had a mean score on the agricultural knowledge section of the Agricultural Awareness Instrument of 19.7 (SD = 4.80). A mean score of 15.6 (SD = 5.63) existed for the students not enrolled in agricultural education in schools with a secondary agricultural education program. The students in schools without a secondary agricultural education program had a mean score of 15.9 (SD = 5.07) on the agricultural knowledge section of the Agricultural Awareness Instrument.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students enrolled in ag. ed. in schools with a secondary ag. ed. program</td>
<td>192</td>
<td>19.7</td>
<td>4.80</td>
</tr>
<tr>
<td>Students not enrolled in ag. ed. in schools with a secondary ag. ed. program</td>
<td>234</td>
<td>15.6</td>
<td>5.63</td>
</tr>
<tr>
<td>Students in schools without a secondary ag. ed. program</td>
<td>290</td>
<td>15.9</td>
<td>5.07</td>
</tr>
</tbody>
</table>

Table 3: Descriptive statistics for agricultural knowledge of eleventh grade students in the participating groups.
Research Question 1:

Is there a difference in the mean scores for agricultural knowledge of eleventh grade students in the following groups?

(a) Students enrolled in agricultural education in schools with a secondary agricultural education program

(b) Students not enrolled in agricultural education in schools with a secondary agricultural education program

(c) Students in schools without a secondary agricultural education program

Analysis of Variance was used to determine if statistically significant differences existed among the mean scores for agricultural knowledge of the groups of eleventh grade students. The results of the Analysis of Variance are reported in Table 4. A significant F statistic as shown in Table 4 represented a significant difference among the eleventh grade students in the participating groups.
Table 4: Analysis of Variance for the dependent variable agricultural knowledge of eleventh grade students in the participating groups.

To identify where differences existed between the groups, a multiple comparison test was performed using the Scheffe test. Group 1 corresponded to students enrolled in agricultural education in schools with a secondary agricultural education program. Group 2 represented students not enrolled in agricultural education in schools with a secondary agricultural education program. Group 3 corresponded to students in schools without a secondary agricultural education program. The results from the Scheffe multiple comparison test are reported in Table 5. Means without a common underline are significantly different. The mean score for agricultural knowledge in group 1 was significantly different than the mean score of group 2 and group 3.
<table>
<thead>
<tr>
<th>Group*</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>19.7</td>
<td>15.6</td>
<td>15.9</td>
</tr>
</tbody>
</table>

1 Students enrolled in agricultural education in schools with a secondary agricultural education program
2 Students not enrolled in agricultural education in schools with a secondary agricultural education program
3 Students in schools without a secondary agricultural education program

Table 5: Statistically significant differences of the mean scores for agricultural knowledge of eleventh grade students in the participating groups.

**Perception Toward Agriculture**

Research questions were developed to determine if statistically significant differences existed among the mean scores for perception toward agriculture of eleventh grade students in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. The scores for perception toward agriculture were obtained from responses to Part II of the Agricultural Awareness Instrument. For scaling purposes, items in Part II that were identified as negatively worded by the panel of experts were recoded to correspond to the other items in the Agricultural Awareness Instrument.
Descriptive statistics related to the perception toward agriculture of eleventh grade students in the study are reported in Table 6. The students who were enrolled in agricultural education in schools with a secondary agricultural education program had a mean score on the perception toward agriculture section of the Agricultural Awareness Instrument of 3.54 (SD = .36). A mean score of 3.32 (SD = .29) existed in the students not enrolled in agricultural education in schools with a secondary agricultural education program. The students in schools without a secondary agricultural education program had a mean score of 3.28 (SD = .28) for their perception toward agriculture.
<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students enrolled in ag. ed. in schools with a secondary ag. ed. program</td>
<td>192</td>
<td>3.54</td>
<td>.36</td>
</tr>
<tr>
<td>Students not enrolled in ag. ed. in schools with a secondary ag. ed. program</td>
<td>234</td>
<td>3.32</td>
<td>.29</td>
</tr>
<tr>
<td>Students in schools without a secondary ag. ed. program</td>
<td>290</td>
<td>3.28</td>
<td>.28</td>
</tr>
</tbody>
</table>

Table 6: Descriptive statistics for perception toward agriculture of eleventh grade students in the participating groups.

Research Question 2:

Is there a difference in the mean scores for perception toward agriculture of eleventh grade students in the following groups?

(a) Students enrolled in agricultural education in schools with a secondary agricultural education program

(b) Students not enrolled in agricultural education in schools with a secondary agricultural education program

(c) Students in schools without a secondary agricultural education program
Analysis of Variance was used to determine if statistically significant differences existed among the mean scores for perception toward agriculture of the groups of eleventh grade students. The results of the Analysis of Variance are reported in Table 7. A significant F statistic as shown in Table 7 represented a significant difference among the eleventh grade students in the participating groups.

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>8.57</td>
<td>2</td>
<td>4.28</td>
<td>44.9*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>68.03</td>
<td>713</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>76.60</td>
<td>715</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p ≤ .05

Table 7: Analysis of Variance for the dependent variable perception toward agriculture of eleventh grade students in the participating groups.

To identify where differences existed among the groups, a multiple comparison test was performed using the Scheffe test. Group 1 corresponded to students enrolled in agricultural education in schools with a secondary agricultural education program. Group 2 represented students not enrolled in agricultural education in schools with a secondary agricultural education program. Group 3 corresponded to students in schools without a secondary
agricultural education program. The results from the Scheffe multiple comparison test are reported in Table 8. Means without a common underline are significantly different. The mean score for perception toward agriculture in group 1 was significantly different than the mean score of group 2 and group 3.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>3.5423</td>
<td>3.3179</td>
<td>3.2817</td>
</tr>
</tbody>
</table>

1Students enrolled in agricultural education in schools with a secondary agricultural education program
2Students not enrolled in agricultural education in schools with a secondary agricultural education program
3Students in schools without a secondary agricultural education program

Table 8: Statistically significant differences of the mean scores for perception toward agriculture of eleventh grade students in the participating groups.

**Relationship Between Selected Demographic Variables and Agricultural Knowledge and Perception Toward Agriculture**

**Research Question 3:**

Can a significant amount of the variance in agricultural knowledge mean scores of eleventh grade students be explained from selected demographic variables?
Demographic variables consisted of the following seventeen items:

1) gender (male, female)
2) home location (farm, rural area, town/city)
3) population of hometown or town nearest home (under 2,500; 2,501-10,000; 10,001-25,000; 25,001-100,000; over 100,000)
4) have relatives who live or work on a farm (yes, no)
5) have relatives who work in an agricultural business (yes, no)
6) how many acres on farm (don’t live on a farm, less than 50 acres, 51-200 acres, 201-750 acres, over 750 acres)
7) enrolled in agricultural education (yes, no)
8) years of agricultural courses in high school (never, less than 1 year, 1 year, 2 years, 3 years, 4 years)
9) member of the FFA (yes, no)
10) member of 4-H (yes, no)
11) raise animals or pets (yes, no)
12) raise plants, gardens, or crops (yes, no)
13) read news magazines most regularly (yes, no)
14) read newspapers most regularly (yes, no)
15) listen to radio news most regularly (yes, no)
16) watch television news most regularly (yes, no)
17) get news from internet most regularly (yes, no)
All categorical variables were dummy coded before being entered into the regression model. Stepwise multiple regression was used to identify those variables that could explain a significant amount of the variance in agricultural knowledge mean scores. Seven demographic variables were identified as significant. They are as follows: FFA member; relatives work in an agricultural business; student gender; raised plants, gardens, or crops; home location; years of agricultural courses; and population of hometown. Intercorrelations, modes for each significant demographic variable, and a description of how each variable was coded before data analysis are reported in Table 9. An analysis of the residuals indicated the assumptions for multiple regression were not violated.

The results from the regression analysis are reported in Table 10. The regression analysis indicated that seven demographic variables could explain 22% of the variance in agricultural knowledge mean scores. The greatest increase in agricultural knowledge scores were when students had relatives who worked in an agricultural business and when they were male.
<table>
<thead>
<tr>
<th>Variable</th>
<th>$X_1$</th>
<th>$X_2$</th>
<th>$X_3$</th>
<th>$X_4$</th>
<th>$X_5$</th>
<th>$X_6$</th>
<th>$X_7$</th>
<th>$Y$</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFA member ($X_1$)$^a$</td>
<td>1.00</td>
<td>.30$^i$</td>
<td>.23$^i$</td>
<td>.17$^i$</td>
<td>.31$^2$</td>
<td>.92$^2$</td>
<td>.16$^2$</td>
<td>.33$^5$</td>
<td>2</td>
</tr>
<tr>
<td>Relatives work in agribusiness ($X_2$)$^b$</td>
<td>1.00</td>
<td>.12$^i$</td>
<td>.20$^i$</td>
<td>.37$^2$</td>
<td>.33$^2$</td>
<td>.20$^2$</td>
<td>.32$^5$</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Student gender ($X_3$)$^c$</td>
<td>1.00</td>
<td>-.01$^i$</td>
<td>.07$^2$</td>
<td>.24$^2$</td>
<td>.07$^2$</td>
<td>.26$^5$</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raised plants, gardens, crops ($X_4$)$^d$</td>
<td>1.00</td>
<td>.24$^2$</td>
<td>.18$^2$</td>
<td>.10$^2$</td>
<td>.21$^5$</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home location ($X_5$)$^e$</td>
<td>1.00</td>
<td>.25$^2$</td>
<td>.22$^2$</td>
<td>.28$^4$</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of agricultural courses ($X_6$)$^f$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>-.08$^3$</td>
<td>.22$^3$</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Population of hometown ($X_7$)$^g$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>-.13$^3$</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Agricultural Knowledge ($Y$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

Agricultural Knowledge:
- Mean = 16.9
- SD = 5.46
- n = 716

$^a$1 = Not an FFA member; 2 = FFA member
$^b$1 = Relatives work in agribusiness; 2 = Relatives don't work in agribusiness
$^c$1 = Male; 2 = Female
$^d$1 = Have raised plants, gardens, or crops; 2 = Have not raised plants, gardens, or crops
$^e$1 = Farm; 2 = Rural area; 3 = Town/City
$^f$1 = Never; 2 = Less than 1 year; 3 = 1 year; 4 = 2 years; 5 = 3 years
$^g$1 = Under 2,500; 2 = 2,501-10,000; 3 = 10,001-25,000; 4 = 25,001-100,000; 5 = Over 100,000

$^i$Phi Coefficient $^i$Eta Coefficient
$^2$Cramer's V Statistic $^3$Kendall's Tau Coefficient
$^4$Point-Biserial Coefficient

Table 9: Summary data of intercorrelations for agricultural knowledge on selected demographic variables (n=716).
<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2$ change</th>
<th>$b$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFA member$^a$</td>
<td>.11</td>
<td>.11</td>
<td>1.76</td>
<td>3.80*</td>
</tr>
<tr>
<td>Relatives work in agribusiness$^b$</td>
<td>.16</td>
<td>.05</td>
<td>1.90</td>
<td>4.73*</td>
</tr>
<tr>
<td>Student gender$^c$</td>
<td>.19</td>
<td>.03</td>
<td>2.15</td>
<td>5.75*</td>
</tr>
<tr>
<td>Raised plants, gardens, crops$^d$</td>
<td>.21</td>
<td>.02</td>
<td>1.50</td>
<td>3.64*</td>
</tr>
<tr>
<td>Home location$^e$</td>
<td>.22</td>
<td>.01</td>
<td>1.23</td>
<td>2.46*</td>
</tr>
<tr>
<td>Years of agricultural courses$^f$</td>
<td>.22</td>
<td>0</td>
<td>1.48</td>
<td>2.05*</td>
</tr>
<tr>
<td>Population of hometown$^g$</td>
<td>.23</td>
<td>.01</td>
<td>.77</td>
<td>2.03*</td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12.34</td>
<td></td>
</tr>
</tbody>
</table>

* $p \leq .05$

Standard error = 4.83
Adjusted $R^2 = .22$
For model: $F = 29.47$, $p \leq .05$

$^a0 = \text{Not an FFA member}; 1 = \text{FFA member}$
$^b0 = \text{Relatives don't work in agribusiness}; 1 = \text{Relatives work in agribusiness}$
$^c0 = \text{Female}; 1 = \text{Male}$
$^d0 = \text{Have not raised plants, gardens, or crops}; 1 = \text{Have raised plants, gardens, or crops}$
$^e0 = \text{Town/City}; 1 = \text{Farm}$
$^f0 = \text{Never}; 1 = 3 \text{ years}$
$^g0 = \text{Less than 2,500}; 1 = 2,501-10,000$

Table 10: Regression for agricultural knowledge on selected demographic variables (n=716).
Research Question 4:

Can a significant amount of the variance in perception mean scores of eleventh grade students be explained from selected demographic variables?

Demographic variables consisted of the following seventeen items:

1) gender (male, female)
2) home location (farm, rural area, town/city)
3) population of hometown or town nearest home (under 2,500; 2,501-10,000; 10,001-25,000; 25,001-100,000; over 100,000)
4) have relatives who live or work on a farm (yes, no)
5) have relatives who work in an agricultural business (yes, no)
6) how many acres on farm (don’t live on a farm, less than 50 acres, 51-200 acres, 201-750 acres, over 750 acres)
7) enrolled in agricultural education (yes, no)
8) years of agricultural courses in high school never, less than 1 year, 1 year, 2 years, 3 years, 4 years)
9) member of the FFA (yes, no)
10) member of 4-H (yes, no)
11) raise animals or pets (yes, no)
12) raise plants, gardens, or crops (yes, no)
13) read news magazines most regularly (yes, no)
14) read newspapers most regularly (yes, no)
15) listen to radio news most regularly (yes, no)
16) watch television news most regularly (yes, no)
17) get news from internet most regularly (yes, no)

All categorical variables were dummy coded before being entered into the regression model. Stepwise multiple regression was used to identify those variables that could explain a significant amount of the variance in perception mean scores. Six demographic variables were identified as significant. They are as follows: FFA member; relatives work in an agricultural business; population of hometown; home location; student gender; and relatives live on a farm. Intercorrelations, modes for each significant demographic variable, and a description of how each variable was coded before data analysis are reported in Table 11. An analysis of the residuals indicated the assumptions for multiple regression were not violated.

The results from the regression analysis are reported in Table 12. The regression analysis indicated that six demographic variables could explain 21% of the variance in perception mean scores. The greatest increase in perception scores were when students had been a member of the FFA.
<table>
<thead>
<tr>
<th>Variable</th>
<th>$X_1$</th>
<th>$X_2$</th>
<th>$X_3$</th>
<th>$X_4$</th>
<th>$X_5$</th>
<th>$X_6$</th>
<th>$Y$</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFA member ($X_1$)</td>
<td>1.00</td>
<td>.30$^1$</td>
<td>.16$^2$</td>
<td>.31$^2$</td>
<td>.23$^1$</td>
<td>.22$^1$</td>
<td>.35$^5$</td>
<td>2</td>
</tr>
<tr>
<td>Relatives work in agribusiness ($X_2$)</td>
<td>1.00</td>
<td>.20$^1$</td>
<td>.37$^2$</td>
<td>.12$^1$</td>
<td>.60$^1$</td>
<td>.30$^5$</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Population of hometown ($X_3$)</td>
<td>1.00</td>
<td>.22$^2$</td>
<td>.07$^2$</td>
<td>.14$^2$</td>
<td>-.18$^3$</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home location ($X_4$)</td>
<td>1.00</td>
<td>.07$^2$</td>
<td>.32$^2$</td>
<td>.29$^4$</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student gender ($X_5$)</td>
<td>1.00</td>
<td>.01$^1$</td>
<td>.20$^5$</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatives live on a farm ($X_6$)</td>
<td>1.00</td>
<td>.25$^5$</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perception Toward Agriculture ($Y$)</td>
<td>1.00</td>
<td>--</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Perception Toward Agriculture:
Mean = 3.36
SD = .33
n = 716

---

$^a_1$ = Not an FFA member; 2 = FFA member
$^b_1$ = Relatives work in agribusiness; 2 = Relatives don't work in agribusiness
$^c_1$ = Under 2,500; 2 = 2,501-10,000; 3 = 10,001-25,000; 4 = 25,001-100,000; 5 = Over 100,000
$^d_1$ = Farm; 2 = Rural area; 3 = Town/City
$^e_1$ = Male; 2 = Female
$^f_1$ = Relatives live on a farm; 2 = Relatives don't live on a farm

$^1$Phi Coefficient  $^4$Eta Coefficient
$^2$Cramer's V Statistic  $^5$Point-Biserial Coefficient
$^3$Kendall's Tau Coefficient

Table 11: Summary data of intercorrelations for perception toward agriculture on selected demographic variables (n=716).
<table>
<thead>
<tr>
<th>Variable</th>
<th>$R^2$</th>
<th>$R^2_{change}$</th>
<th>$b$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFA member(^a)</td>
<td>.13</td>
<td>.13</td>
<td>.16</td>
<td>6.19*</td>
</tr>
<tr>
<td>Relatives work in agribusiness(^b)</td>
<td>.17</td>
<td>.04</td>
<td>.06</td>
<td>2.15*</td>
</tr>
<tr>
<td>Population of hometown(^c)</td>
<td>.19</td>
<td>.02</td>
<td>.10</td>
<td>4.26*</td>
</tr>
<tr>
<td>Home location(^d)</td>
<td>.20</td>
<td>.01</td>
<td>.10</td>
<td>3.46*</td>
</tr>
<tr>
<td>Student gender(^e)</td>
<td>.22</td>
<td>.02</td>
<td>.09</td>
<td>3.82*</td>
</tr>
<tr>
<td>Relatives live on a farm(^f)</td>
<td>.22</td>
<td>0</td>
<td>.06</td>
<td>2.10*</td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
<td>3.14</td>
</tr>
</tbody>
</table>

\(^*p \leq .05\)

Standard error = .29
Adjusted $R^2 = .21$
For model: $F = 33.44$, $p \leq .05$

\(^a\) 0 = Not an FFA member; 1 = FFA member
\(^b\) 0 = Relatives don’t work in agribusiness; 1 = Relatives work in agribusiness
\(^c\) 0 = Less than 2,500; 1 = 2,501-10,000
\(^d\) 0 = Town/City; 1 = Farm
\(^e\) 0 = Female; 1 = Male
\(^f\) 0 = Relatives live on farm; 1 = Relatives don’t live on farm

Table 12: Regression for perception toward agriculture on selected demographic variables (n=716)
CHAPTER 5

SUMMARY, CONCLUSIONS, DISCUSSION OF FINDINGS, AND RECOMMENDATIONS

The purpose of this study was to assess the agricultural knowledge and perception toward agriculture of eleventh grade students in Ohio rural schools. The study further sought to determine differences in the level of agricultural knowledge and perception toward agriculture in the following groups: (a) students enrolled in agricultural education in schools with a secondary agricultural education program, (b) students not enrolled in agricultural education in schools with a secondary agricultural education program, and (c) students in schools without a secondary agricultural education program. This chapter is organized into the following sections: research questions, summary of methodology, summary of findings for agricultural knowledge, summary of findings for perception toward agriculture, conclusions, discussion, implications, and recommendations for further research.
Research Questions

Research questions were developed to achieve the purposes of the study.

The study was designed to answer the following research questions:

(1) Is there a difference in the mean scores for agricultural knowledge of eleventh grade students in the following groups?
   (a) Students enrolled in agricultural education in schools with a secondary agricultural education program
   (b) Students not enrolled in agricultural education in schools with a secondary agricultural education program
   (c) Students in schools without a secondary agricultural education program

(2) Is there a difference in the mean scores for perception toward agriculture of eleventh grade students in the following groups?
   (a) Students enrolled in agricultural education in schools with a secondary agricultural education program
   (b) Students not enrolled in agricultural education in schools with a secondary agricultural education program
   (c) Students in schools without a secondary agricultural education program
(3) Can a significant amount of the variance in agricultural knowledge mean scores of eleventh grade students be explained from selected demographic variables?

(4) Can a significant amount of the variance in perception mean scores of eleventh grade students be explained from selected demographic variables?

**Summary of Methodology**

**Population and Sample**

The target population for this study included students in the eleventh grade in all public secondary schools in Ohio, which were located in counties with less than 200,000 persons as identified by the 1990 U.S. Census. A stratified random sample of 20 schools with a secondary agriculture education program and 20 schools without a secondary agriculture education program, as well as 10 schools in each group to serve as replacements was obtained through systematic random sampling.

**Instrumentation**

The instrument used for this study of agricultural literacy was based on the Agricultural Awareness Survey (1992), which was developed by the Agricultural
Education faculty and graduate students at the University of Missouri-Columbia. The Agricultural Awareness Survey (1992) contained seven concept areas identified by Frick (1991) that included the following: societal and global significance, agricultural policies and economic impact, natural resources, plants, animals, processing, and marketing. The Agricultural Awareness Instrument consisted of three parts: knowledge of agriculture, perception toward agriculture, and personal information. To establish validity of the instrument for this study, a panel of experts was used to establish content and face validity. The Agricultural Awareness Instrument was pilot tested for reliability. Internal consistency for Part I and Part II was calculated for the agricultural knowledge section (.90) and the perception toward agriculture section (.81).

**Summary of Findings for Agricultural Knowledge**

Students who were enrolled in agricultural education in schools with a secondary agricultural education program had a mean score on the agricultural knowledge section of the Agricultural Awareness Instrument of 19.7 (SD = 4.80). A mean score of 15.6 (SD = 5.63) existed for students not enrolled in agricultural education in schools with a secondary agricultural education program. Students in schools without a secondary agricultural education program had a mean score of 15.9 (SD = 5.07) on the agricultural knowledge section of the Agricultural Awareness Instrument.
Research question one was tested using Analysis of Variance at an *a priori* .05 alpha level. Analysis of Variance determined that a statistically significant difference existed among the groups' mean scores for agricultural knowledge. The Scheffe test identified where the differences existed. The agricultural knowledge mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was significantly different than the agricultural knowledge mean score of students not enrolled in agricultural education in schools with a secondary agricultural education program. The agricultural knowledge mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was also significantly different than the agricultural knowledge mean score of students in schools without a secondary agricultural education program. No difference existed between the agricultural knowledge mean score of students not enrolled in agricultural education in schools with a secondary agricultural education program and the agricultural knowledge mean score of students in schools without a secondary agricultural education program.

Research question three was tested using stepwise multiple regression at an *a priori* .05 alpha level. Regression analysis indicated that seven demographic variables explained 22% of the variance in agricultural knowledge mean scores. The demographic variables included: being an FFA member; had relatives who worked in an agricultural business; student gender was male; had raised plants,
gardens, or crops; home location was farm; had 3 years of agricultural courses; and population of hometown was 2,500 – 10,000.

**Summary of Findings for Perception Toward Agriculture**

Students who were enrolled in agricultural education in schools with a secondary agricultural education program had a mean score on the perception toward agriculture section of the Agricultural Awareness Instrument of 3.54 (SD = .36). A mean score of 3.32 (SD = .29) existed for students not enrolled in agricultural education in schools with a secondary agricultural education program. Students in schools without a secondary agricultural education program had a mean score of 3.28 (SD = .28) for their perception toward agriculture.

Research question four was tested using Analysis of Variance at an *a priori* .05 alpha level. Analysis of Variance determined that a statistically significant difference existed among the groups' mean scores for their perception toward agriculture. The Scheffe test identified where the differences existed. The perception mean score for students enrolled in agricultural education in schools with a secondary agricultural education program was significantly different than the perception mean score of students not enrolled in agricultural education in schools with a secondary agricultural education program. The perception mean score for students enrolled in agricultural education in schools
with a secondary agricultural education program was also significantly different 
than the perception mean score of students in schools without a secondary 
agricultural education program. No difference existed between the perception 
mean score of students not enrolled in agricultural education in schools with a 
secondary agricultural education program and the perception mean score of 
students in schools without a secondary agricultural education program.

Research question three was tested using stepwise multiple regression at an 
*a priori* .05 alpha level. The regression analysis indicated that six demographic 
variables explained 21% of the variance in perception mean scores. The 
demographic variables included: being an FFA member; had relatives worked in 
an agricultural business; population of hometown was 2,500 – 10,000; home 
location was farm; student gender was male; and had relatives live on a farm.

**Conclusions**

The following conclusions were drawn from the findings of the study.

(1) Students enrolled in secondary agricultural education programs had a 
greater knowledge of agriculture than students not enrolled in secondary 
agricultural education programs.

(2) Students enrolled in secondary agricultural education programs had a more 
positive perception toward agriculture than students not enrolled in 
secondary agricultural education programs.
(3) Agricultural education programs did make a difference in increasing basic agricultural knowledge of students; thus increasing their agricultural literacy.

(4) Agricultural education programs did make a difference by allowing students to have a more positive perception toward agriculture; thus increasing their agricultural literacy.

(5) Students who had one or more of the following seven demographic characteristics had a greater knowledge of agriculture than students without these characteristics: being an FFA member; had relatives who worked in an agricultural business; student gender was male; had raised plants, gardens, or crops; home location was farm; 3 years of agricultural courses; and population of hometown was 2,501 – 10,000.

(6) Students who had one or more of the following six demographic characteristics had a more positive perception toward agriculture than students without these characteristics: being an FFA member; had relatives who worked in an agricultural business; population of hometown was 2,500 – 10,000; home location was farm; student gender was male; and had relatives who lived on a farm.

(7) A significant moderate positive relationship existed ($r = .46$) between agricultural knowledge scores and perception scores.


**Discussion**

The study's findings indicated significant differences existed among the mean scores for agricultural knowledge and perception for the groups participating in the study. These differences could be attributed to the following: agricultural education increased students' agricultural knowledge and perception, and student demographic characteristics made a difference in increasing agricultural literacy. However, even though the differences in mean scores of students enrolled and students not enrolled in a secondary agricultural education program were statistically significant, they were not overwhelmingly different. Students enrolled in agricultural education had a mean score of 20 out of 29 items for 69% correctness on the agricultural knowledge section. Students not enrolled in agricultural education in schools with and without a secondary agricultural education program had mean scores of 16 out of 29 items for 55% correctness on the agricultural knowledge section. The percentages for students enrolled and not enrolled in a secondary agricultural education program were different, but very low for educational standards. For the perception section, the mean score for students enrolled in agricultural education was 3.5 and it was 3.3 for students not enrolled in agricultural education in schools with and without a secondary agricultural education program. Again, differences were not overwhelming.
So what does this say about today's young people? Are they agriculturally illiterate? Do they possess a basic level of agricultural knowledge? This study showed evidence that there is a lack of agricultural knowledge in all three groups of eleventh grade students. The most shocking finding was those students enrolled in agricultural education answered only 69% of the agricultural knowledge items correctly. It is noted that these items were not technical agricultural items, but basic agricultural items. And for perception toward agricultural, wouldn't one expect agricultural students to have a more positive perception toward agriculture? The scores did not show a great difference among the groups. This study reinforced previous research that most of today's young people lack a basic understanding of the agricultural industry's role and its significance.

It is also noted that a moderate correlation ($r = .46$) was found between knowledge scores and perception scores. Students who had a greater agricultural knowledge tended to have a more positive perception toward agriculture.

**Implications**

A critical factor influencing the decline of agricultural literacy in the nation has been the lack of emphasis placed on it in education (Balshweid, Thompshon, & Cole, 1998). The results from the study indicated enrollment in agricultural
education increased a student's basic agricultural literacy. However, all agricultural educators need to assess their instructional content to make sure their students are getting a basic understanding of the agricultural industry. Maybe teachers are not teaching the necessary concepts of agricultural literacy.

More incorporation and implementation of agricultural literacy efforts are needed to increase the agricultural knowledge and perception of the public. All organizations, institutions, businesses, companies, commodity groups, and the like involved in the agricultural industry have to assume the role of educating the citizenry to be knowledgeable about the food and fiber industry. Only in this way can we ensure a larger percentage of the general population is knowledgeable about agriculture and be “able to participate in establishing the policies that will support a competitive agricultural industry in this country and abroad” (National Research Council, 1988, p. 2).

**Recommendations for Further Research**

1. A replication of this study in urban and suburban schools in the state of Ohio.
2. A comparison of the data from this study to the data from Missouri and other states.
3. A study of the effectiveness of the Food For America program of elementary students in Ohio schools.
(4) A study of the extent to which 4-H contributes to agricultural awareness in Ohio's youth.

(5) A study to describe the extent of use and effectiveness of Ohio's Agriculture in the Classroom.
APPENDICES
APPENDIX A

Randomly Sampled Schools With and Without a Secondary Agricultural Education Program and Replacement Schools
### Schools With a Secondary Agricultural Education Program

<table>
<thead>
<tr>
<th>Elida*</th>
<th>Danville</th>
<th>Replacements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hillsdale*</td>
<td>Mt. Vernon</td>
<td>New Bremen*</td>
</tr>
<tr>
<td>Minster*</td>
<td>Loudonville*</td>
<td>Triad*</td>
</tr>
<tr>
<td>Mechanicsburg</td>
<td>Parkway*</td>
<td>Beaver Local</td>
</tr>
<tr>
<td>West Liberty-Salem*</td>
<td>Mt. Gilded*</td>
<td>Southern Local*</td>
</tr>
<tr>
<td>Spencerville</td>
<td>Wayne Trace*</td>
<td>Fairview</td>
</tr>
<tr>
<td>Ayersville</td>
<td>Adena*</td>
<td>Washington Local</td>
</tr>
<tr>
<td>Miami Trace*</td>
<td>Zane Trace*</td>
<td>Xenia</td>
</tr>
<tr>
<td>Greeneview*</td>
<td>Fairlawn*</td>
<td>Urbana</td>
</tr>
<tr>
<td>Hiland*</td>
<td>Edgerton</td>
<td>Stryker</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fort Loramie</td>
</tr>
</tbody>
</table>

### Schools Without a Secondary Agricultural Education Program

| Allen East* | Yellow Springs | Replacements: |
| Bluffton* | Jewett-Scio* | Defiance* |
| Lima* | Marion* | Fairborn |
| Memorial | Aurora* | Jonathan Alder* |
| New Knoxville* | J. A. Garfield | Antwerp |
| Graham | Streetsboro | Ravenna |
| David Anderson* | Chillicothe* | Windham* |
| East Palestine | Houston | Jackson Center |
| Wellsville | Sidney* | Edon |
| Beavercreek* | Hilltop | Shawnee* |
|         |          | Columbiana |

* Indicates Participating Schools
APPENDIX B

Agricultural Awareness Instrument
Agricultural Awareness

AN ASSESSMENT OF AGRICULTURAL LITERACY OF ELEVENTH GRADE STUDENTS IN OHIO
PART I: AGRICULTURAL KNOWLEDGE

Directions: Read each TRUE/FALSE statement below and circle the letter which corresponds to your answer. If you DON'T KNOW whether the answer is true or false, circle the “DK” in the “Don’t Know” column.

Example:

<table>
<thead>
<tr>
<th>U.S. farms are smaller than those in Europe.</th>
<th>True</th>
<th>False</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>If you think the statement is FALSE, circle the letter “F” in the FALSE column.</em></td>
<td></td>
<td></td>
<td>DK</td>
</tr>
</tbody>
</table>

1. There are more farmers in the U.S. than there were 10 years ago.  
   - True T  
   - False F  
   - Don’t Know DK

2. Less than 3% of the U.S. gross national product is from agriculture.  
   - True T  
   - False F  
   - Don’t Know DK

   - True T  
   - False F  
   - Don’t Know DK

4. The use of pesticides has increased the yield of crops.  
   - True T  
   - False F  
   - Don’t Know DK

5. Animal health and nutrition are important to farmers.  
   - True T  
   - False F  
   - Don’t Know DK

6. Food safety is a major concern of the food processing industry.  
   - True T  
   - False F  
   - Don’t Know DK

7. Processing increases the cost of food products.  
   - True T  
   - False F  
   - Don’t Know DK

8. U.S. research has improved farming methods in other countries.  
   - True T  
   - False F  
   - Don’t Know DK

9. One of every five jobs in the U.S. is related to agriculture.  
   - True T  
   - False F  
   - Don’t Know DK
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Many farmers use tillage practices that conserve the soil.</td>
<td>True</td>
<td>False</td>
</tr>
<tr>
<td>11. Plant products are the main source of human foods.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>12. Animals can be a valuable source of medical products.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>13. Homogenization kills bacteria in milk with heat.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>14. The U.S. does not sell its feed grain on the world market.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>15. Thousands of people in the world die of starvation each year.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>16. Local laws and regulations have little effect on farmers.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>17. Farming and wildlife cannot survive in the same geographic area.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>18. Biotechnology has increased the pest resistance of plants.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>19. Animals eat foodstuffs that cannot be digested by humans.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>20. New products have been developed using surplus grains.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>21. Grain exports are usually transported between continents by airplane.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>22. The average U.S. farm is larger than 500 acres.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>23. U.S. agricultural policies influence food prices in other countries.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>24. Animal wastes are used to increase soil fertility.</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>25. Profits increase as farmers strive for the maximum crop yields.</td>
<td>T</td>
<td>F</td>
</tr>
</tbody>
</table>
26. Biotechnology has increased animal production in the U.S. | True | False | Don’t Know
27. Pasteurization kills bacteria in milk with heat. | T | F | DK
28. An efficient food distribution system is essential to the agricultural industry. | T | F | DK
29. Several countries depend on U.S. agricultural exports for food and fiber. | T | F | DK
30. Government subsidy payments to farmers are used to stabilize food prices. | T | F | DK
31. Water, soil, and minerals are important in agriculture. | T | F | DK
32. Very little of the grain produced in the U.S. is exported. | T | F | DK
33. Hamburger is made from the meat of pigs. | T | F | DK
34. Using grain alcohol for fuel reduces the U.S. dependence on foreign oil. | T | F | DK
35. Transportation and storage affects the supply of agricultural products. | T | F | DK

* The following items for Part I Agricultural Knowledge were identified as having low internal reliability and not used for data analysis: 6, 11, 20, 27, 31, and 33.

* The following items for Part II Perception Toward Agriculture were identified as having low internal reliability and not used for data analysis: 38, 40, 42, 44, 47, 49, 50, 54, 56, and 63.

Please continue to the next page ➔
PART II: PERCEPTION TOWARDS AGRICULTURE

Directions: Read each statement below and circle the response which best represents your perception towards agriculture. Use the following key:

SA  Strongly Agree
A   Agree
N   Neutral
D   Disagree
SD  Strongly Disagree

Example:
All farmers live beyond their means

If you DISAGREE with the statement, circle the “D” to the right of the statement.

36. U.S. citizens spend a higher percentage of their income on food than citizens in other countries.

37. Agriculture employs a large number of people in this country.

38. Pesticides can be used safely when producing food.

39. Organic production methods are a realistic alternative to using pesticides.

40. Confinement is an acceptable practice when raising livestock.

41. Consumers prefer processed foods to raw products.

42. Developing countries need help to be able to store food safely.

43. People are moving away from rural areas due to changes in agriculture.

44. Farmers earn too much money.
45. Not all land is suitable for farming. 

46. Biotechnology has increased the yield of crops in developing countries. 

47. Farmers take good care of their animals. 

48. Processing adds value to farm products. 

49. Farmers should develop new and innovative marketing strategies. 

50. A strong agricultural industry is more important than military power. 

51. Agricultural exports help to reduce the U.S. trade deficit. 

52. Agricultural practices are harmful to the environment. 

53. Raising hybrid plants results in higher yields. 

54. Farmers are concerned about the humane treatment of animals. 

55. Processing food products is a benefit to consumers. 

56. The U.S. should allow free trade with other countries for food products. 

57. The world food supply has increased as a result of improved technology. 

58. The U.S. needs a steady supply of food and fiber products to remain strong. 

59. Only organic methods should be used to produce food. 

60. Farmers should not use chemicals in crop production. 

61. Animals have the same rights as people.
62. Processing adds more to the cost of food than the raw product.

63. Farmers have no control over food prices.

64. Developing countries lack the ability to produce enough food.

65. The government should exert more control over farming.

66. Agriculture is the greatest polluter of our water supplies.

67. Agriculture has become too mechanized.

68. Animals should not be used for food.

69. Farm grains are becoming an important energy source in the U.S.

70. Developing countries need help in distributing food among needy people.

PART III: PERSONAL INFORMATION

Directions: Read each statement in this section carefully. Place a check mark (√) in the box which is the most accurate response.

71. Gender: □ Male □ Female

72. Where is your home located? □ Farm □ Rural area □ Town/City

73. What is the population of your hometown or the town nearest your home?
   □ under 2,500
   □ 2,501 - 10,000
   □ 10,001 - 25,000
   □ 25,001 - 100,000
   □ over 100,000

74. Do you have relatives who live or work on a farm? □ Yes □ No

75. Do you have relatives who work in an agricultural business? □ Yes □ No
76. If you live on a farm, how many acres are included on the farm?
   ☐ Don't live on a farm
   ☐ Less than 50 acres
   ☐ 51 - 200 acres
   ☐ 201 - 750 acres
   ☐ over 750 acres

77. Are you currently enrolled in Agricultural Education? ☐ Yes ☐ No

78. How many years have you taken agricultural courses in high school?
   ☐ Never ☐ 2 years
   ☐ Less than 1 year ☐ 3 years
   ☐ 1 year ☐ 4 years

79. Are you currently or have you ever been a member of the FFA? ☐ Yes ☐ No

80. Are you currently or have you ever been a member of 4-H? ☐ Yes ☐ No

81. Have you been involved in raising animals or pets? ☐ Yes ☐ No

82. Have you been involved in raising plants, gardens, or crops? ☐ Yes ☐ No

83. What grade level are you currently?
   ☐ Freshman
   ☐ Sophomore
   ☐ Junior
   ☐ Senior

Which of the following news sources do you use regularly?
84. News magazines ☐ Yes ☐ No
85. Newspapers ☐ Yes ☐ No
86. Radio ☐ Yes ☐ No
87. Television ☐ Yes ☐ No
88. Internet ☐ Yes ☐ No

THANK YOU

By answering this questionnaire and sending it in, you are implying informed consent.

A cooperative project of: University of Missouri, Lincoln University, Michigan State University, & Purdue University
This material is based upon work supported by the U.S. Department of Agriculture Cooperative State Research Service under Agreement No. 91-COPP-J-0720
APPENDIX C

Panel of Experts
Panel of Experts

Dr. Joseph A. Gliem
Associate Professor, Agricultural Education
The Ohio State University
208 Agricultural Administration
2120 Fyffe Road
Columbus, Ohio 43210
614-292-6321

Dr. Wesley E. Budke
Associate Professor, Agricultural Education
The Ohio State University
212 Agricultural Administration
2120 Fyffe Road
Columbus, Ohio 43210
614-292-4624

Mr. Dan J. Schroer
Agricultural Instructor
London City Schools
336 Elm Street
London, Ohio 43140
740-852-5705

Mr. Jaime X. Castillo
Doctoral Graduate Student
Department of Human & Community Resource Development
250 Agricultural Administration
2120 Fyffe Road
Columbus, Ohio 43210
614-292-1354

Mr. John W. Soloninka
Doctoral Graduate Student
Department of Human & Community Resource Development
250 Agricultural Administration
2120 Fyffe Road
Columbus, Ohio 43210
614-292-1354
APPENDIX D

Parental Information Sheet
To: Parents of Eleventh Grade Students
From: Michael L. Gower, Graduate Student, The Ohio State University
Re: Participation in a study of Agricultural Literacy

Dear Parents:

This letter is to inform you that your son/daughter’s eleventh grade class was randomly selected from all Ohio high schools to participate in a study of agricultural literacy. This study will assess agricultural literacy by determining the level of knowledge that students hold in agriculture and their perception towards the food and fiber industry.

Similar studies around the country have found that America’s students know very little about the agricultural industry. Yet, it is the food and fiber industry that is so vital to our existence.

The principal will administer a questionnaire during class that measures agricultural knowledge and agricultural perception. Participation in this questionnaire is voluntary and anonymous. Student names will not be used in any way and students may quit at any time.

Your encouragement and support in this study is greatly appreciated.

Thank you.

Michael L. Gower
Graduate Student – OSU
PH: 614.292.1354
E-mail: gower.4@osu.edu

Joseph A. Gliem
Professor – OSU
Principal Investigator
APPENDIX E

Cover Letter to Principals in Schools with a Secondary Agricultural Education Program
January 4, 1999

Dear High School Principal:

My name is Michael Gower and I am a graduate student in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. I am conducting a research study for my thesis under the direction of Dr. Joseph Gliem.

I would like to thank you for your school’s participation in this study of agricultural literacy in Ohio schools with and without a secondary agricultural program. The purpose of this study is to assess the level of knowledge that eleventh grade students hold in agriculture and their perceptions towards the food and fiber industry.

Your assistance in administering the enclosed questionnaires is very important to the success of this study. The information your school provides will be combined with information from other schools. The information will not be used in any manner that would identify an individual school or student. Parental information sheets, required by the Human Subjects Review Board, are also included to inform parents of student participation prior to administering.

I am requesting that the questionnaires be administered to one class (25 students or less) of eleventh grade students in the high school which you randomly select plus the eleventh grade students in agricultural education. For example, if your school has 75 total eleventh graders divided into three different classes of 25 students, you would randomly select one class of the three in which to administer the questionnaires in addition to the agriculture students. Students that are in both classes should only complete the questionnaire once. Your cooperation in this detail will be greatly appreciated.

The questionnaires should take approximately 20 minutes to complete. Upon completion, please identify the two groups of students by rubber banding them separately and marking which ones are the agriculture students. Please return questionnaires in the self-addressed stamped envelope by January 29, 1999.

Thank you for your assistance and participation in this study.

Sincerely,

Michael L. Gower
Graduate Student - OSU
PH: 614.292.1354
E-mail: gower.4@osu.edu

Joseph A. Gliem
Professor - OSU
Principal Investigator
APPENDIX F

Cover Letter to Principals in Schools without a Secondary Agricultural Education Program
January 4, 1999

Dear High School Principal:

My name is Michael Gower and I am a graduate student in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. I am conducting a research study for my thesis under the direction of Dr. Joseph Gliem.

I would like to thank you for your school’s participation in this study of agricultural literacy in Ohio schools with and without a secondary agricultural program. The purpose of this study is to assess the level of knowledge that eleventh grade students hold in agriculture and their perceptions towards the food and fiber industry.

Your assistance in administering the enclosed questionnaires is very important to the success of this study. The information your school provides will be combined with information from other schools. The information will not be used in any manner that would identify an individual school or student. Parental information sheets, required by the Human Subjects Review Board, are also included to inform parents of student participation prior to administering.

I am requesting that the questionnaires be administered to one class (25 students or less) of eleventh grade students which you randomly select. For example, if your school has 75 total eleventh graders divided into three different classes of 25 students, you would randomly select one class of the three in which to administer the questionnaires. Your cooperation in this detail will be greatly appreciated.

The questionnaires should take approximately 20 minutes to complete. Upon completion, please return questionnaires in the self-addressed stamped envelope by January 29, 1999.

Thank you for your assistance and participation in this study.

Sincerely,

Michael L. Gower
Graduate Student – OSU
PH: 614.292.1354
E-mail: gower.4@osu.edu

Joseph A. Gliem
Professor – OSU
Principal Investigator

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LIST OF REFERENCES


