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Agricultural awareness and perceptions of freshmen at West Virginia University

Laura L. Pfeifer
West Virginia University

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Agricultural Awareness and Perceptions of Freshmen at West Virginia University

Laura L. Pfeifer

Thesis submitted to the
Davis College of Agriculture, Forestry, and Consumer Sciences
at West Virginia University
in partial fulfillment of the requirements
for the degree of

Master of Science
in
Agricultural and Extension Education

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Morgantown, West Virginia
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ABSTRACT

Agricultural Awareness and Perceptions of Freshmen at West Virginia University

Laura L. Pfeifer

Increased dependence on technology and further removal from agricultural practices has given rise to a decrease in agricultural literacy among members of society, which has established a need for advancement in educating individuals about the basic concepts of agriculture. This study was designed to determine the knowledge of agriculture possessed by incoming freshmen at West Virginia University (WVU). The data collected for this study were obtained from 403 freshmen participants who reported their responses to 35 Agricultural Knowledge, 35 Agricultural Perceptions, and 24 demographic statements and questions on an instrument administered during multiple First Year Orientation courses at WVU. It was revealed that all students lacked a good understanding of agriculture, but students with an agricultural background and who were enrolled in a major in the Davis College of Agriculture, Forestry, and Consumer Sciences were more knowledgeable about and possessed more positive perceptions of agriculture than their counterparts.

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CHAPTER I

Introduction

Throughout the last century, society has undergone a tremendous technological makeover from which today's agriculture has not been exempt. Advances in efficiency and productivity have resulted in less than two percent of the American population now providing the food and fiber on which to run the country (Womochil, 2007b). The wealth of such agricultural commodities has secured the United States' position as a leader in the world-wide market of food and fiber:

Robust global economic growth provides a foundation for gains in world demand for agricultural products. Rapid expansion of ethanol and biodiesel production in some countries also adds to the growth in global agricultural demand. The growing economies of developing countries are the main source of growth in world agricultural demand and trade. Food consumption and feed use are particularly responsive to income growth in those countries...(USDA ERC, 2008, np).

Such significant advances in technological practices have enabled agriculturists to produce more products using fewer resources, including land. A portion of this unused agricultural land has shifted to non-agricultural uses. A 1997 statistic showed an increase in the use of nearly 17 million acres of land in the United States for expansion of urban development (Vesterby & Krupa, 1997). Agricultural land used for housing developments, shopping centers, and recreational facilities has affected rural and agricultural communities (Douglas, 1995). Non-agricultural uses of land shift the availability of land for the purposes of agricultural practices towards ever increasing urban dwellings in rural areas.

According to data collected by the U.S. Census Bureau in 2000, 79% of the United States' population is located in an urban setting (this is listed in the references).

The remaining 21% of the population located in rural settings are further broken down into those individuals who are farm or non-farm residents. Distinguishing between these two categories cannot be done due how the United States Department of Agriculture (USDA) collects and reports Census of Agriculture data. In West Virginia, the data are quite different. Fifty-four percent of the population in WV lives in rural settings, while 46% live in urban settings. “Much has changed since the formal program of agricultural education was implemented in 1917. Agriculture has changed, moving from 31 percent of the population living and working on farms to less than two percent” (Womochil, 2007b, p. 8).

The 98% of the American population not producing agricultural commodities depends on the ability of the other 2% to meet their demands. Despite the necessity for agricultural products, and the impact that they generate on the American and international economies, minimal exposure by the majority of society to general concepts concerning everyday agricultural relationships has become the norm (Birkenholz, 1992; Birkenholz, Harris, & Pry, 1994; Frick, Birkenholz, & Machtmes, 1996; Harris & Birkenholz, 1996; Leising, 1998; Mawby, 1985; National Research Council, 1988; Raven, 1994; Womochil, 2007a; Womochil, 2007b). Within family structures and school systems, a lack of recognition, education, and implementation of agricultural knowledge is on the rise (Birkenholz, 1992; Birkenholz, Harris, & Pry, 1994; Frick, Birkenholz, Gardner, & Machtmes, 1995; Harris & Birkenholz, 1996; Leising, 1998; National Research Council, 1988; Riedel, 2006; Webb, 1995; Womochil, 2007a ; Womochil, 2007b).

Few will argue that the current status of society’s agricultural awareness and perceptions are in great need of attention. Russell G. Mawby of the W. K. Kellogg

Foundation (1985) began the forward to *Cultivating Agricultural Literacy: Challenge for the Liberal Arts* with a statement about the rightful status of agriculture in today's society, stating that "Few issues are of greater importance to the world than adequate food supplies, proper food use, and knowledge about the components of the agricultural industry" (Mawby, 1985, p. 7). This idea of how important it is to have agriculturally knowledgeable members of society was identified and highlighted over twenty years ago, and little change has taken place. Yet policies concerning agriculture and agricultural production continue to thrive and require updating. If society has such little recognition and understanding of the basic concepts surrounding the agricultural industry, its ability to meet the needs and demands of producers and consumers is limited. When it comes down to it, from clothes and food to homes and vehicles, the number of areas where agriculture reaches is virtually limitless. Because agriculture plays such an important role in everyone's day-to-day lives, the average citizen should have an understanding of the agricultural industry and appreciation for the effects that various agricultural practices and policies have on their daily lives.

Despite the abundance of research implicating agriculturists as vital members of society, similar research has shown a trend toward less reliance on individual knowledge of agriculture and more dependence on that of the small fraction of those who make a living by it.

Statement of the Problem

Observing ever increasing changes in the abundance and availability of new technological practices while a dwindling effect appears in relation to the knowledge, appreciation, and comprehension of agricultural practices begs the question, has a

technologically savvy society given rise to a decrease in agricultural literacy among its members?

Has society grown to depend so greatly on instant gratification that it can no longer develop a rationale for the processes that develop, prepare, and meet their everyday needs? In 20 or so years, will there be enough individuals fully knowledgeable and capable to provide for such demands, or more importantly the needs, of society? Has the education system failed students in preparing them with adequate knowledge about agricultural systems? The role of the agricultural education teacher, in part, is to convey to the students practical skills and sound knowledge of agricultural practices (Womochil, 2007a) as well as implementing other core curriculum such as English and math into these lessons. Yet, why is there little influence of agriculture being taught within these core classes? Research indicates a lack of agricultural knowledge among most school aged children, college students, and the general public, but what does this imply for the future of mankind in relation to the provision of necessary agricultural commodities (Birkenholz, 1992; Birkenholz, Harris, & Pry, 1994; Frick, Birkenholz, Gardner, & Machtmes, 1995; Harris & Birkenholz, 1996; Leising, 1998; Mawby, 1985; National Research Council, 1988; Raven, 1994; Riedel, 2006; Webb, 1995; Womochil, 2007)? Will there be enough agriculturists in the future to meet the demands of society? Are there enough individuals within high ranking political positions who possess an adequate knowledge of agriculture to make appropriate decisions on agricultural policy issues? The concept for this study was to evaluate the current state of knowledge and perceptions of agriculture among college students and to provide further information to support continued agricultural literacy campaigns.

Purpose of the Study

The purpose of this research study was to determine the knowledge of agriculture possessed by incoming freshmen at West Virginia University. Accessible first year students from all majors and colleges within West Virginia University completed a questionnaire, which assessed and provided data that illustrated their knowledge of general agricultural related topics.

Objectives of the Study:

The specific objectives of this study were as follows:

- 1) To assess the level of agricultural knowledge and perceptions possessed by incoming freshmen;
- 2) To compare the results of knowledge and perceptions possessed by students with an agricultural background to those students with no agricultural background; and
- 3) To assess and compare the level of knowledge and perceptions possessed by students as a collective body from non-agricultural colleges against those students from the agriculture college of West Virginia University.

Definitions of Terms

Agricultural awareness: an individual's level of agricultural literacy.

Agricultural literacy: an individual's comprehension of the food and fiber industry, which includes production, processing, distribution, and marketing, as well as an awareness of how agriculture impacts the environment, society, and daily living of that person (Webb, 1995).

Agricultural perceptions: an individual's opinions concerning the nature of the food and fiber industry.

Limitations of the Study

This study was limited to freshmen enrolled as fulltime students in orientation classes at West Virginia University in Morgantown, WV during the Fall 2007 semester. Only those students who participated in completing the agricultural literacy test developed by Martin J. Frick and others were included in the results of this study.

CHAPTER II

Review of Literature

Little debate exists as to whether or not society lacks an understanding of agriculture; research has confirmed that there is in fact a shortfall of agriculturally literate individuals within today's society (Birkenholz, 1992; Birkenholz, Harris, & Pry, 1994; Frick, Birkenholz, & Machtmes, 1996; Frick, Birkenholz, Gardner, & Machtmes, 1995; Harris & Birkenholz, 1996; Leising, 1998; Mawby, 1985; National Research Council, 1988; Raven, 1994; Riedel, 2006; Webb, 1995; Womochil, 2007a; Womochil, 2007b). With an agricultural working class composed of less than two percent of the American population (Womochil, 2007a; Womochil, 2007b) and 79% of the population living in urban settings (U.S. Census Bureau, 2008), it is evident that there has been a shift in society's relationship with agriculture.

This change in location of the population both geographically and in reference to current employment trends has in effect changed the way individuals have prioritized their lives. Once a popular high school course, vocational agriculture, more recently identified as agricultural education, has seen a reduction in student enrollment numbers (Rossetti & McCaslin, 1991).

Little to no information is available for identifying a rational number of students enrolled in agricultural education courses. However, according to the 2005-2006 *Annual Report on Agricultural Education* published by Team Ag Ed, 7,242 active FFA chapters were reported. An average of 68 students belonged to each chapter, resulting in approximately 500,000 student members of the National FFA Organization. All members of the FFA program are required to be enrolled in an agricultural education

course, so it is evident that there are a minimum of one-half million students participating in such courses. According to the National Center for Education Statistics (NCES), approximately 15,000,000 9th-12th grade students enrolled in public schools during the 2005-2006 academic school year, making up the majority of grades for which students participate in the FFA program and agricultural education courses (NCES, 2005-06). These statistics identify a large gap between the total number of students in the school system and those students who actively participate in agricultural education courses that increase their exposure to agriculture.

Despite a common theme tending towards decreased agricultural education enrollment, student enrollment in middle school FFA programs in 1991 was estimated at nearly 53,000 (Rossetti & McCaslin, 1991). In only three years (the National FFA Organization passed an amendment to their constitution in 1988 allowing middle school aged students to gain membership to the program), the enrollment of students in FFA grew from 401,000 students during the 1991-1992 school year to 417,000 students the following year. This admittance of middle school students into the agricultural education program was “beneficial to the students...” who “were more aware about agriculture and more informed about careers in agriculture” (Rossetti & McCaslin, 1991, p.26).

A study conducted by Riedel (2006) using North Carolina urban schools evaluated the effects of an introductory agricultural education course on the agricultural literacy and perceptions of students enrolled in the course. Riedel investigated the level of success achieved by students who participated in an agriscience applications class with respect to agricultural literacy and their knowledge of agricultural careers and opportunities for employment, agriculture’s relationship with public policy, and

agriculture's relationship with the environment and natural resources, as well as student's perceptions of the food and fiber industry. The results indicated a general increase in the student's scores upon completion of the course, but the post-test scores reflected an overall lack of literacy relating to agriculture as compared to national standards. Riedel's conclusion reflected "a need for agriculturally literate citizens and more importantly a means to educate today's students and tomorrow's society" (Riedel, 2006, p. 53).

The idea of agricultural literacy was developed as a result of findings from the study conducted by the National Research Council, Board on Agriculture, Committee on Agricultural Education in Secondary Schools. In *Understanding Agriculture: New Directions for Education* (1988), the National Research Council published its working definition of agricultural literacy.

...an agriculturally literate person's understanding of the food and fiber system would include its history and its current economic, social, and environmental significance to all Americans. This definition is purposely broad, and encompasses some knowledge of food and fiber production, processing, and domestic and international marketing. As a compliment to instruction in other academic subjects, it also includes enough knowledge of nutrition to make informed personal choices about diet and health. Agriculturally literate people would have the practical knowledge needed to care for their outdoor environments, which include lawns, gardens, recreational areas, and parks. (National Research Council, 1988, p. 8-9)

The basis for this definition stemmed from major findings of the report stating that "Agricultural education in U.S. high schools does not extend beyond the offering of a vocational agriculture program" (National Research Council, 1988, p. 2). With such a strong statement indicating a lack of education referencing agriculture throughout all school systems, the Council's recommendations included changing the focus of agricultural education and "Beginning in kindergarten and continuing through twelfth

grade, all students should receive some systematic instruction about agriculture” (National Research Council, 1988, p. 2). Despite these findings, the Council (1988) also identified a positive correlation between students enrolled in vocational agriculture programs and their development of practical skills, self-confidence, and leadership abilities.

In his 1990 delphi study of important agricultural concepts necessary for individuals to possess acceptable literacy of agriculture, Martin J. Frick established a definition of agricultural literacy as perceived by professionals in varying agriculture-related fields. Eleven broad areas of agriculture were identified from which a vast number of more specific concepts concerning each broad category were also established. Frick summarized the categories and developed the definition of agricultural literacy as,

... understanding and possessing a knowledge 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 knowledge includes: the production of plant and animal products (divided into separate concept areas in the concept questionnaire), the economic impact of agriculture, its societal significance, agriculture’s important relationship with natural resources and the environment (divided into separate concept areas in the concept questionnaire), the marketing and processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. (Frick, 1990, p. 41)

To avoid confusion about the depth to which individuals should be agriculturally literate, Frick, Birkenholz, Gardner, & Machtmes (1995) noted that, “Functional agricultural literacy does not imply a perfect level of understanding about agriculture, but rather a minimum level” (p. 2).

There has always been a strong connection between agricultural education and the workings of Land Grant Universities, as the later were established in response to the

Land Grant College Act of 1862, better known as the First Morrill Act. It was through this congressional act that the mission “to teach agriculture, military tactics, and the mechanic arts as well as classical studies so that members of the working classes could obtain a liberal, practical education” (WVU Extension Service, 1999, np) was established. Benefited by the Hatch Act of 1887, the second Morrill Act of 1890, and the Smith-Lever Act of 1914 in which funds were provided for research in agriculture, monies were distributed to those universities not discriminating against admitting students of races outside of the white population or to establish additional colleges for black students, and development of the Cooperative Extension Service, respectively, the land grant university system has exerted a great influence on the agricultural education system. With the majority of agricultural educators receiving instruction from land grant universities, as well as research conducted in such facilities leading to subject matter implemented in the classroom, it is evident that Land Grant Universities provide immeasurable resources for educating individuals about agriculturally relevant material.

A momentous report by the National Research Council (1988) addresses the significant lack of agricultural knowledge possessed by the majority of Americans. This knowledge is reflective of basic concepts of agriculture, including “its social and economical significance in the United States,” and “its links to human health and environmental quality” (National Research Council, 1988, p. 9). In other words, the report illustrates that not only is agriculture relevant to those immediately exposed to it, but every individual who depends on food, fiber, and other basic necessities to sustain their life. In addition, the report acknowledges that “Few systematic educational efforts are made to teach or otherwise develop agricultural literacy in students of any age,” and

even when attempts are made to implement agriculture into the context of the class courses, “the material tends to be fragmented, frequently outdated, usually only farm oriented, and often negative or condescending in tone” (National Research Council, 1988, p. 9).

Much consideration has been given to developing fundamental ways in which agricultural literacy can be increased in all citizens. A work group of individuals, under the direction of R. J. Birkenholz, developed *Strategies to Promote Agricultural Literacy* in which they identified and discussed the agricultural literacy issues concerning Americans in today’s society as well as described recommendations for alleviating the current poor conditions reflecting the lack of agricultural literacy of the general public. Among a wide variety of other alternatives, the Agricultural Literacy Work Group discussed the idea that “Teachers in elementary and secondary schools should also be encouraged (possibly required) to develop a greater understanding of the importance of agriculture to all people” (Birkenholz, 1992, p. 15). In reference to students enrolled in post-secondary education, the Work Group suggested that:

College students, especially those attending land-grant institutions, should be required to develop an awareness of and appreciation for agriculture prior to their graduation from any degree program. Graduates of higher education institutions should not be viewed as ‘fully educated’ if they lack an awareness of the importance of agriculture in their daily lives.
(Birkenholz, 1992, p. 16)

In the October 2007 issue of *FFA Advisors Making a Difference*, a new proposal presented by Team Ag Ed, known as the 10 X 15 initiative, was the main focus of discussion. In part, the initiative states that “By 2015 there will be in operation 10,000 quality agricultural science education programs serving students through an integrated model of classroom/laboratory instruction, experiential learning, and leadership and

personal skill development” (Womochil, 2007a, p.1). The current USDA statistics identify that “17 percent of the domestic workforce is engaged in more than 300 agriculture career areas” yet “agricultural education is not serving 17 percent of the student population, but rather about 6 percent...” (Womochil, 2007b, p.7). When looking at these statistics and comparing them to the ideal goal to be reached by 2015, it is apparent that something must change in order to facilitate a higher enrollment of students in agricultural education courses to provide the expected number of educators with employment opportunities. In addition, influencing students to enroll in higher education courses and becoming agricultural educators is necessary. Ultimately, if students are to acquire knowledge concerning agriculture and, therefore increase their agricultural literacy levels, a significant change in education must occur.

The 1994 study of agricultural literacy among college students by Birkenholz, Harris, & Pry assessed their level of knowledge relating to agriculture and suggested that despite an overall knowledge of agriculture and positive perceptions concerning agriculture, several variables influenced those individuals whose agricultural literacy levels were higher. Students who had family members living on a farm, and raised crops or gardens were the most knowledgeable about agriculture, while college students living in closer proximity to highly developed geographical locations were less knowledgeable about agriculture. Their recommendations to alleviate such situations among college students include providing students with farm experience as well as implementing agricultural education programs throughout elementary, secondary, and higher education courses (Birkenholz, Harris, & Pry, 1994).

In a study of agriculture literacy among high school students, it was identified that “Rural High School Students respondents had significantly higher knowledge concept scores than Urban Inner-City High School respondents in all of the seven areas,” but only significantly higher perceptions concerning “the animal and plant areas” (Frick et al., 1995, p. 7). As a result, their recommendations concerning the identification of agricultural literacy among a specified group “be first directed to address the agricultural knowledge that the targeted audience does not know rather than verifying the agricultural knowledge they do know” (Frick et al., 1995, p. 8). In an additional study conducted by Frick, Birkenholz, & Machtmes (1995), knowledge and perceptions of agriculture possessed by rural and urban adults were identified using the same/similar instrument. Their conclusions indicated that “Respondents living on farms were more knowledgeable about agriculture than their rural non-farm neighbors, who were more knowledgeable than their urban counterparts” and “Both respondents groups had relatively positive perceptions of agriculture” (Frick, Birkenholz, & Machtmes, 1996, p. 51). However, further investigation into developing programs that would enhance the agricultural literacy of all individuals was strongly recommended by the researchers (Frick, Birkenholz, & Machtmes, 1996).

In 1995, Webb conducted a study addressing the issue of *Agricultural Knowledge of Entering Agriculture Majors at Potomac State College and West Virginia University*. Using a 100 question test developed by random selection of questions from the West Virginia Department of Education completer competency tests in agriculture-related courses, Webb made several conclusions related to agricultural literacy based on the results of 55 students from two West Virginia schools of higher education. It was noted

that “freshmen students enrolled in agricultural curricula...have limited knowledge of agriculture” and “Students who have taken agriculture in high school have only slightly more knowledge than those who did not take high school agriculture” (Webb, 1995, p. 33). However, Webb identified those students who participated in agriculture classes in high school, had a “farm background and agricultural related employment,” and had “prior agricultural related experiences” were more positively influenced as to the development of their agricultural knowledge (Webb, 1995, p. 33). Her overall conclusion reflected a need for increased agricultural education for students as well as educators.

If educators at all levels are expected to implement agricultural knowledge into their curricula, they must first have working knowledge and an understanding of the concepts of agriculture. In order that the material taught by teachers be accurate and effective, resources for educating them must be made available. However, among educators there is a vast range of levels of agricultural literacy and perceptions which must first be assessed before developing and implementing programs for educating teachers. Even so, it is paramount that all educators, regardless of content area taught, make the connection “to agriculture and...provide a context for infusing instruction about agriculture” (Harris & Birkenholz, 1996, p. 64) into their course content. Harris & Birkenholz (1996) addressed this issue of teacher related agricultural literacy. Their findings indicated that those respondents who participated in the study (mostly associated with schools which offered courses in agricultural education) possessed some level of knowledge and positive perceptions toward agriculture. This study, specifically associated with its relatively inconclusive results, emphasizes the need for education relative to agriculture at all levels, including youth as well as adults.

The reoccurring theme that all investigations into agricultural literacy address is that there is a lack of knowledge about agriculture among the majority of society, including our educators, which in effect generates a cyclical problem. “Many people have a narrow and antiquated perception of agriculture,” (Leising, 1998, np) leaving it difficult for them to make connections between the current practices of agriculture and ways in which these ideas can be incorporated into the current educational curricula. Despite the lack of knowledge most teachers outside of agricultural education possess, most teachers are willing to learn about agriculture and utilize the knowledge they gain as a source of information to be implemented into their classroom lessons and procedures (Bellah & Dyer, 2007).

Whether an individual plans to follow a career path directly or indirectly associated with agriculture, the simple fact remains that there is no way to escape the influence that agriculture has on everyone’s life. “Agriculture is too important a topic to be taught only to the relatively small percentage of students considering careers in agriculture and pursuing vocational agriculture studies” (National Research Council, 1988, p. 1). Consuming food, wearing clothes, living in a home made with wood studs, and participating in any outdoor recreational activity are only a few examples of how agriculture and its products and byproducts directly affect every individual’s life. Public policies developed and implemented in the United States, which affect both agriculturists and non-agriculturists alike, often produce negative impacts on the production of food and fiber products (Raven, 1994). Much of this is a result of individual’s lack of knowledge of the food and fiber production systems. “Yet today most people, including

those in key positions of public decision-making, do not understand the complexities of America's food system..." (Mawby, 1985, p. 7).

Continued efforts to further agricultural literacy depend on investigating the current status of agriculturally literate individuals and groups, which Doerfert (2003) has noted to be a job well done by researchers in agricultural education. Doerfert's main point of concern, however, is the lack of research done to evaluate the most beneficial courses of action in which the most significant results leading to an increase in agricultural literacy are obtained.

Strides toward educating individuals about agriculture do exist in a variety of forms. Programs such as Ag in the Classroom and Food for America are geared toward educating youth at the elementary level. Extension Services provide programs dealing directly with agricultural related issues to members of the community. Places such as the Slate Run Living Historical Farm in Westerville, OH, Meadowcroft Rockshelter and Museum of Rural Life in Avella, PA, and New Jersey Museum of Agriculture in New Brunswick, NJ are examples of only a minute percent of available hands-on resources for individuals to experience rural living as it was done hundreds of years ago. A simple Internet search for agriculture-related resources produces millions of results. However, with all of these available resources, little is done to directly influence and educate the common public, and more specifically policy makers, whose decisions decide the fate of agricultural practices, not to mention those programs developed to educate individuals about the agricultural practices (Raven, 1994).

It is a well known concept that beginning education at an early age benefits the capacity an individual has for retaining and comprehending the information. In

connection to this idea, educating young individuals about agriculture may establish an early understanding and acceptance of agricultural issues (Blackburn, 1999).

“Educational philosophers such as Socrates, Aristotle, Pestalozzi, Rousseau, Comenius and Benjamin Franklin all recognized the value of a child’s learning about agriculture” (Blackburn, 1999, np). Programs such as Ag Science Fairs and elementary school gardens have proven to be valuable tools for increasing agricultural literacy among young children (Blackburn, 1999; Camp, 2004).

The USDA recently conducted a study that analyzed the impact of the Ag in the Classroom program, developed in 1981 by the USDA to incorporate agricultural issues into general classes such as math, science, history, English, and other courses. The findings of the study, which was conducted at the elementary school level (grades Kindergarten through sixth) in classrooms whose teachers had received training in agriculture by Ag in the Classroom (AITC), illustrated the benefits of performing such additions to the classroom curriculum. The findings concluded that even though all of the students displayed some knowledge of agriculture prior to learning from the instructor, those students who received education from AITC trained teachers more effectively learned the information and were ultimately more knowledgeable about agriculture than those students who were taught by an instructor who had not received training from AITC (Leising, Pense, & Portillo, 2003).

The theme of the July-August edition of *The Agricultural Education Magazine* focused around literacy in agriculture, specifically, “Achieving 2020: Goal 3: All students are conversationally literate in agriculture, food, fiber, and natural resource systems” (Moore, 2000, np). As the mission of The National Strategic Plan and Action

Agenda for Agricultural Education states, “Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems” (Team Ag Ed, 2000, np). A national revamping of the agricultural education system is the goal of this initiative. Discussion in this specific issue highlighted many of the common themes addressing agricultural literacy, including grasping the concept of the idea of such a term, associations which aid in educating and promoting education for youth about agriculture, the lack of agricultural literacy exhibited by students across the nation’s school systems, implementing agricultural education into the general classroom setting, and preparing future educators with the agricultural knowledge they need for the classroom. As the magazine theme illustrates, all of the discussions focused on the main concept that there is a lack of knowledge among our youth, our young adults, adults, and even individuals in the education system and highly influential policy makers.

Research supports the concept that a substantial change in agricultural awareness and perceptions among functioning individuals in today’s society must be achieved so as to ensure a positive outlook for the agricultural industry. Denying or ignoring the current agricultural literacy situation will do no more than strengthen the agriculturally illiterate.

Summary

Today’s society is now further removed from agriculture than ever before. Technology has significantly influenced a trend leading individuals in greater numbers toward urban settings and away from the farm.

With this disconnect between society and agricultural life, individuals more frequently fail to gain knowledge about the workings and concepts of agriculture. Policy

makers and educators are amongst those lacking such knowledge, in turn leading to deficient policies for agriculturists and minimal education of America's youth. In short, there is an increasing lack of agricultural knowledge among citizens; agricultural illiteracy is on the rise.

CHAPTER III

Methodology

Purpose of the Study

The purpose of this research study was to determine the knowledge of agriculture possessed by incoming freshmen at West Virginia University. Accessible first year students from all majors and colleges within West Virginia University completed a questionnaire which assessed and provided data that illustrated their knowledge of general agricultural related topics.

Objectives of the Study:

The specific objectives of this study were as follows:

- 1) To assess the level of agricultural knowledge and perceptions possessed by incoming freshmen;
- 2) To compare the results of knowledge and perceptions possessed by students with an agricultural background to those students with no agricultural background; and
- 3) To assess and compare the level of knowledge and perceptions possessed by students as a collective body from non-agricultural colleges against those students from the agriculture college of West Virginia University.

Research Design

A descriptive research design was selected as the method for this study. The objective of using descriptive research is to allow the researcher the opportunity to make generalizations about different groups based on the data collected from the sample population while also assessing their attitudes and perceptions in regard to a specific issue. In addition, it allows for more variety in the range of information to be collected, a

larger population from which to collect data, the ability to address actual circumstances, and identifying more detailed problems. Those disadvantages associated with this type of research include the collection of unnecessary responses, being costly in both time and money, and lacking external validity and the collection of valid data. (Ary, D., Jacobs, L. C., Razavieh, A., & Sorensen, C., 2006).

Population

The target population of this study was all 4,731 incoming college freshmen at West Virginia University (WVU) in Morgantown, WV enrolled during the 2007 fall semester. The target population consisted of 51% male and 49% female students, 57% of which represented all 55 counties from West Virginia, and 49 states, the District of Columbia, 2 Territories (Puerto Rico and Virgin Islands) and 99 Nations were also represented in the population. Seven percent of the target population were identified as minorities.

All entering freshmen are required by University policy to participate in a First Year Experience course. Due to University policy, a complete list of incoming freshmen students as well as a list of all scheduled First Year Experience courses was not available to the researcher. This made a census of incoming freshmen possible by using the listing of scheduled First Year Experience courses posted on WVU's course registration page. A purposeful sample was self selected as instructors of these courses were contacted via email and asked for their permission and cooperation in distributing the questionnaire to the students present during their scheduled class times. Only those students of instructors who responded and allowed their students to participate were included in the study. The

accessible population was 417 incoming freshmen who participated in a First Year Experience course during the 2007 fall semester at West Virginia University.

Instrumentation

The instrument for this study was a questionnaire consisting mainly of questions obtained from a previous study performed by Riedel in 2006 as well as one in 1995 by Fritz, Birkenholz, Gardner, and Machtmes. These instruments were used to measure the agricultural knowledge and perceptions of high school students. The researcher gained permission to use the instrument in their study by contacting Martin J. Frick, co-author of the 1995 study. Only a small portion of the demographic questions in the questionnaire were used from the original survey. The majority of the demographic questions in the survey were developed by the researcher (see Appendix B).

The instrument consisted of three main sections which included agricultural knowledge, perceptions, and demographics. The agricultural knowledge questions covered areas of general agricultural knowledge, agricultural career literacy, agricultural policy literacy, and environmental and natural resources agricultural literacy. Respondents were instructed to select two answers for each of the 35 agricultural knowledge statements. If they believed the statement to be true, they were to circle “T,” or if they believed the statement to be false, they were to circle “F.” Based on their level of confidence in their answer, respondents were also instructed to circle “S” if they were sure their response was correct or “U” if they were unsure of their response.

The perceptions section of the questionnaire consisted of 35 statements for which respondents were asked to rate their opinion by using a Likert scale. Respondents were instructed to circle the letter that most accurately corresponded to their opinion on the

scale which ranged from Strongly Agree (SA) to Agree (A) to Neutral (N) to Disagree (D) to Strongly Disagree (SD).

The demographics section was developed using questions designed to enable the researcher to make comparisons among the respondents as well as inform the researcher of potential background information on respondents pertaining to agricultural exposure. Demographic questions included information about the respondent's gender, age, ethnicity, home location, education status, individual's and relative's work experience on a farm and in an agricultural business, participation in and availability of agricultural courses and organizations in high school and college, and knowledge of Land Grant Universities and WVU's farms.

An additional portion of the questionnaire included a separate sheet for respondents to remove and fill out if they desired to participate in a potential follow-up study. The form asked for their name, permanent address, and primary email address and phone numbers, as well as any comments regarding the questionnaire so that they could be contacted in the future should a follow-up study to this study take place (see Appendix C).

The validity and reliability of the original instrument was established (Frick et al., 1996; Riedel, 2006). A Kr-20 score of 0.85 was found, indicating that the Overall Agricultural Knowledge statements in the original instrument were reliable. A Chronbach's alpha coefficient score of 0.90 was found for the Agricultural Literacy Perceptions statement. In order to determine the validity of the statements, the instrument was presented to a national panel of experts in agricultural literacy for review.

The instrument was determined to be a valid tool for assessing agricultural literacy and perceptions of high school students (Frick, et.al., 1995).

In order to avoid measurement error, the content and face validity of the current instrument used in this study was presented to a panel of experts from West Virginia University consisting of faculty members with extensive professional, teaching, and research in agriculture and deemed valid for use in measuring concepts relative to agricultural literacy. The instrument was deemed valid.

The total data set was used to establish the instrument's reliability for the population of WVU freshmen students. The questionnaire was divided into three segments and the split-half statistical procedure was used to establish their reliability. The segments included agricultural knowledge answer, agricultural knowledge certainty, and perceptions. The reliability of the three portions: agricultural knowledge answer, agricultural knowledge certainty, and perceptions was found to be exemplary at 0.79, 0.96, and 0.41 respectively (Robinson, Shaver, & Wrightsman, 1991).

Data Collection

Each participating instructor was contacted via email to establish the location, time, and day for implementing the questionnaire to the students in their class(es). The researcher attended the scheduled classes where a cover letter (see Appendix D) was distributed to each student and the letter was read to the group. The letter described the nature of the study and emphasized voluntary participation and the need for accurate responses. The researcher then distributed the questionnaires and instructed the students to carefully read through the directions to each of the three sections of the questionnaire. Once students completed the questionnaire, they removed the single sheet of paper which

was used to gather a list of respondents for a possible future study of agricultural literacy and placed it in a pile on the front desk. They placed the questionnaire in a separate pile. Due to the nature of how the data were collected, in a classroom setting with respondents present, there was no need to perform statistical tests to compensate for non-response error or late respondents.

Analysis of Data

No identification numbers were used to identify respondents. However, as the data from each questionnaire were transferred from the paper copy to an electronic copy, a number was placed on the front side of the questionnaire in order that it might be traced to the original instrument during data analysis. The data were coded and entered into an Excel[®] file, which was then used in an SPSS program for statistical evaluation. Depending on the type of data gathered, different types of statistical analyses were performed.

The first two sections of the instrument included Agricultural Knowledge and Agricultural Literacy Perception statements. Descriptive statistics, including measures of central tendency and variability, were used to describe the 70 statements in these sections. The demographic data collected in the third portion of the instrument were also analyzed using descriptive statistics.

During the second phase of the data analysis, the false responses among the 35 true and false statements were reverse coded. Statements which reflected inaccurate perceptions of agriculture from the perceptions portion of the instrument were also reverse coded. The 403 respondents were categorized into Davis College/Non-Davis College and Agricultural Background/Non-Agricultural Background respondent groups.

Independent *t*-tests were used to compare Davis and non-Davis students, as well as students with an agricultural background and students without an agricultural background, on overall Agricultural Knowledge (OAK), General Agricultural Knowledge (GAK), Agricultural Career Literacy (ACL), Agricultural Policy Literacy (APL), Environmental and Natural Resources Agricultural Literacy (ENRAL), and Agricultural Literacy Perceptions (ALP). Hypotheses developed for the statistical comparison of these groups included:

$$H_0 = M_{\text{Davis College OAK}} = M_{\text{Non-Davis College OAK}}$$

$$H_1 = M_{\text{Davis College OAK}} \neq M_{\text{Non-Davis College OAK}}$$

$$H_0 = M_{\text{Agricultural Background OAK}} = M_{\text{Non-Agricultural Background OAK}}$$

$$H_1 = M_{\text{Agricultural Background OAK}} \neq M_{\text{Non-Agricultural Background OAK}}$$

$$H_0 = M_{\text{Davis College GAK}} = M_{\text{Non-Davis College GAK}}$$

$$H_1 = M_{\text{Davis College GAK}} \neq M_{\text{Non-Davis College GAK}}$$

$$H_0 = M_{\text{Agricultural Background GAK}} = M_{\text{Non-Agricultural Background GAK}}$$

$$H_1 = M_{\text{Agricultural Background GAK}} \neq M_{\text{Non-Agricultural Background GAK}}$$

$$H_0 = M_{\text{Davis College ACL}} = M_{\text{Non-Davis College ACL}}$$

$$H_1 = M_{\text{Davis College ACL}} \neq M_{\text{Non-Davis College ACL}}$$

$$H_0 = M_{\text{Agricultural Background ACL}} = M_{\text{Non-Agricultural Background ACL}}$$

$$H_1 = M_{\text{Agricultural Background ACL}} \neq M_{\text{Non-Agricultural Background ACL}}$$

$$H_0 = M_{\text{Davis College APL}} = M_{\text{Non-Davis College APL}}$$

$$H_1 = M_{\text{Davis College APL}} \neq M_{\text{Non-Davis College APL}}$$

$$H_0 = M_{\text{Agricultural Background APL}} = M_{\text{Non-Agricultural Background APL}}$$

$$H_1 = M_{\text{Agricultural Background APL}} \neq M_{\text{Non-Agricultural Background APL}}$$

$$H_0 = M_{\text{Davis College ENRAL}} = M_{\text{Non-Davis College ENRAL}}$$

$$H_1 = M_{\text{Davis College ENRAL}} \neq M_{\text{Non-Davis College ENRAL}}$$

$$H_0 = M_{\text{Agricultural Background ENRAL}} = M_{\text{Non-Agricultural Background ENRAL}}$$

$$H_1 = M_{\text{Agricultural Background ENRAL}} \neq M_{\text{Non-Agricultural Background ENRAL}}$$

$$H_0 = M_{\text{Davis College ALP}} = M_{\text{Non-Davis College ALP}}$$

$$H_1 = M_{\text{Davis College ALP}} \neq M_{\text{Non-Davis College ALP}}$$

$$H_0 = M_{\text{Agricultural Background ALP}} = M_{\text{Non-Agricultural Background ALP}}$$

$$H_1 = M_{\text{Agricultural Background ALP}} \neq M_{\text{Non-Agricultural Background ALP}}$$

Use of Findings

The findings of this research project will be compared to those of Riedel (2006) and Frick et al. (1995) to further the identification of agricultural literacy issues. In addition, an awareness of how knowledgeable students are about agriculture will enhance the instruction of agriculture-related topics at the elementary, middle, and high school levels.

CHAPTER IV

Findings

Purpose of the Study

The purpose of this research study was to determine the knowledge of agriculture possessed by incoming freshmen at West Virginia University (WVU). Accessible first year students from all majors and colleges within West Virginia University completed a questionnaire which assessed and provided data that illustrated their knowledge of general agricultural related topics.

Objectives of the Study:

This study was implemented to evaluate agricultural awareness and perceptions of freshmen at WVU while considering the influence of agricultural experiences prior to attending college. Agricultural literacy of students enrolled in the Davis College of Agriculture, Forestry and Consumer Sciences at WVU was compared to the level of agricultural literacy possessed by students enrolled in all other WVU colleges. Areas of interest concerning agricultural knowledge which were evaluated using an agricultural literacy test included general agricultural knowledge, agricultural career literacy, agricultural policy literacy, and environmental and natural resources agricultural literacy.

The specific objectives of this study were as follows:

- 1) To assess the level of agricultural knowledge and perceptions possessed by incoming freshmen;
- 2) To compare the results of knowledge and perceptions possessed by students with an agricultural background to those students with no agricultural background; and

- 3) To assess and compare the level of knowledge and perceptions possessed by students as a collective body from non-agricultural colleges against those students from the agriculture college of West Virginia University.

The accessible population consisted of 417 freshmen students at West Virginia University during the Fall 2007 semester. Four hundred three useable questionnaires were analyzed.

Gender of Respondents

Respondents were asked to identify their gender. Female respondents included 216 (53.6%) individuals while 186 (46.2%) respondents were male. One (0.2%) respondent did not identify their gender (see Table 1).

Table 1

Gender of Respondents

| | N | % |
|-------------|-----|------|
| Female | 216 | 53.6 |
| Male | 186 | 46.2 |
| No Response | 1 | .2 |

Age of Respondents

Respondents were asked to identify their age using four categories. Thirty-three (8.2%) respondents identified their age to be less than 18 years. Three hundred forty-six (85.9%) of the respondents listed their age to be in the 18-21 years category. The “22-25 years” and “more than 26 years” categories included 16 (4.0%) and seven (1.7%)

respondents, respectively. One (0.2%) respondent failed to provide their age (see Table 2).

Table 2

Age of Respondents

| | N | % |
|--------------------|-----|------|
| Less than 18 years | 33 | 8.2 |
| 18-21 years | 346 | 85.9 |
| 22-25 years | 16 | 4.0 |
| More than 26 years | 7 | 1.7 |
| No Response | 1 | .2 |

Ethnicity of Respondents

Respondents were asked to identify their ethnic group. Three hundred sixty-four (90.3%) respondents listed their ethnicity as “White.” The category “Hispanic” was listed by 12 (3.0%) respondents as their ethnicity. Nine (2.2%) of the respondents listed their ethnicity as “Black” and six (1.5%) respondents selected more than one ethnicity, and were classified as “Multi-Ethnic.” The category “Asian or Pacific Islander” was listed by five (1.2%) respondents as their ethnicity. The “Other” category (see Appendix E) included four (1.0%) respondents. Two (0.5%) respondents identified their ethnicity as “American Indian or Alaskan Native” and one (0.2%) respondent failed to provide their ethnicity (see Table 3).

Table 3

Ethnicity of Respondents

| | N | % |
|-----------------------------------|-----|------|
| White | 364 | 90.3 |
| Hispanic | 12 | 3.0 |
| Black | 9 | 2.2 |
| Multi-Ethnic | 6 | 1.5 |
| Asian or Pacific Islander | 5 | 1.2 |
| Other | 4 | 1.0 |
| American Indian or Alaskan Native | 2 | .5 |
| No Response | 1 | .2 |

Home State of Respondents

All respondents in the study were asked to identify their home state. One hundred fifty-two (37.7%) respondents identified their home state as West Virginia. Seventy-one (17.6%) respondents identified their home state as Pennsylvania. New Jersey was reported as the home state for 34 individuals (8.4%). Thirty-two (7.9%) of the respondents listed their home state as Maryland. Twenty-two (5.5%) respondents identified their home state as Virginia. Fourteen (3.5%) respondents identified New York as their home state. Ten (2.5%) respondents identified their home state as Ohio. Florida was reported as the home state for four (1.0%) respondents. Three (0.7%) respondents identified Connecticut and three (0.7%) respondents identified Illinois as their home state. There were two (0.5%) respondents each for the states of Colorado, Delaware, Georgia, North Carolina, and Rhode Island. There was one (0.2%) respondent each for

the states of Indiana, Kentucky, Maine, Massachusetts, Missouri, Tennessee, and Wisconsin. One (0.2%) respondent identified their home state as one of the United States' other territories. One (0.2%) respondent identified their home state as being multiple states and 39 (9.7%) respondents failed to provide their home state (see Table 4).

Table 4

Home State of Respondents

| | N | % |
|-------------------|-----|------|
| WV-West Virginia | 152 | 37.7 |
| PA-Pennsylvania | 71 | 17.6 |
| NJ-New Jersey | 34 | 8.4 |
| MD-Maryland | 32 | 7.9 |
| VA-Virginia | 22 | 5.5 |
| NY-New York | 14 | 3.5 |
| OH-Ohio | 10 | 2.5 |
| FL-Florida | 4 | 1.0 |
| CT-Connecticut | 3 | .7 |
| IL-Illinois | 3 | .7 |
| CO-Colorado | 2 | .5 |
| DE-Delaware | 2 | .5 |
| GA-Georgia | 2 | .5 |
| NC-North Carolina | 2 | .5 |
| RI-Rhode Island | 2 | .5 |
| IN-Indiana | 1 | .2 |
| KY-Kentucky | 1 | .2 |

Table 4 (Continued)

Home State of Respondents

| | N | % |
|------------------|----|-----|
| ME-Maine | 1 | .2 |
| MA-Massachusetts | 1 | .2 |
| MO-Missouri | 1 | .2 |
| TN-Tennessee | 1 | .2 |
| WI-Wisconsin | 1 | .2 |
| Other Territory | 1 | .2 |
| Multiple States | 1 | .2 |
| No Response | 39 | 9.7 |

Home Country of Respondents

All respondents in the study were asked to identify their home country. Three hundred seventy-one (92.1%) respondents identified the United States of America as their home country. A United States Territory, the United States of America and Asia, Asia, and Central America were each identified by one (0.2%) respondent as their home country. Two (0.5%) respondents each identified their home country as Africa and Europe. Twenty-four (6.0%) respondents failed to identify their home country (see Table 5).

Table 5

Home Country of Respondents

| | N | % |
|-------------------------------|-----|------|
| United States of America | 371 | 92.1 |
| Africa | 2 | .5 |
| Europe | 2 | .5 |
| United States Territory | 1 | .2 |
| United States of America-Asia | 1 | .2 |
| Asia | 1 | .2 |
| Central America | 1 | .2 |
| No Response | 24 | 6.0 |

Traditional College Student

All respondents in the study were asked to identify whether they were a traditional or non-traditional student. Three hundred eighty-two (94.8%) respondents were traditional college students while 19 (4.7%) respondents were not traditional college students. Two (0.5%) respondents failed to list whether or not they were a traditional college student (see Table 6).

Table 6

Traditional College Student

| | N | % |
|-------------|-----|------|
| Yes | 382 | 94.8 |
| No | 19 | 4.7 |
| No Response | 2 | .5 |

College Rank of Respondents

All respondents in the study were asked to identify their college rank using one of seven categories. One (0.2%) respondent failed to list their college rank. Two hundred ninety-eight (73.9%) respondents listed their college rank as “First Semester Freshman.” Sixty-four (15.9%) respondents listed “Freshman” as their college rank. Twenty-three (5.7%) respondents listed their college rank as “Sophomore.” Eight (2.0%) respondents each listed their college rank as “Junior” and eight (2.0%) respondents list their rank as “Senior.” One (0.2%) respondent listed their college rank as “Other,” noting that they were a transfer student (see Table 7).

Table 7

College Rank of Respondents

| | N | % |
|-------------------------|-----|------|
| First Semester Freshman | 298 | 73.9 |
| Freshman | 64 | 15.9 |
| Sophomore | 23 | 5.7 |
| Junior | 8 | 2.0 |
| Senior | 8 | 2.0 |
| Other | 1 | .2 |
| Graduate Student | 0 | 0.0 |
| No Response | 1 | .2 |

College Major of Respondents

All respondents in the study were asked to identify their college major. A complete listing is provided in Appendix F. All majors were then classified within their

respective colleges within West Virginia University. One hundred fourteen (28.3%) respondents identified majors within the Davis College of Agriculture, Forestry, & Consumer Sciences. Ninety-two (22.8%) respondents identified majors within the Eberly College of Arts and Sciences. Fifty-nine (14.6%) respondents identified majors within the College of Business and Economics. Thirty (7.4%) respondents identified majors within the College of Human Resources and Education. Twenty-one (5.2%) respondents identified majors within the College of Creative Arts and 21 (5.2%) identified majors in the College of Physical Education. Sixteen (4.0%) respondents identified their major as undeclared. Ten (2.5%) respondents identified majors within the Perley Isaac Reed School of Journalism. Nine (2.2%) respondents identified majors within the School of Medicine. Eight (2.0%) respondents identified majors within the School of Nursing. Seven (1.7%) respondents identified majors within the School of Pharmacy. Five (1.2%) respondents identified majors within the School of Applied Social Sciences. Four (1.0%) respondents identified majors within the College of Engineering and Mineral Resources. Five (1.2%) respondents did not identify their college major. The responses of two (0.5%) respondents were illegible (see Table 8).

Table 8

College Major of Respondents

| | N | % |
|---|-----|------|
| Davis College of Agriculture, Forestry, & Consumer Sciences | 114 | 28.3 |
| Eberly College of Arts & Sciences | 92 | 22.8 |
| College of Business & Economics | 59 | 14.6 |
| College of Human Resources & Education | 30 | 7.4 |
| College of Creative Arts | 21 | 5.2 |
| School of Physical Education | 21 | 5.2 |
| Undeclared | 16 | 4.0 |
| Perley Isaac Reed School of Journalism | 10 | 2.5 |
| School of Medicine | 9 | 2.2 |
| School of Nursing | 8 | 2.0 |
| School of Pharmacy | 7 | 1.7 |
| School of Applied Social Sciences | 5 | 1.2 |
| College of Engineering & Mineral Resources | 4 | 1.0 |
| No Response | 5 | 1.2 |
| Illegible | 2 | .5 |

Classification of Home Geographical Location of Respondents

All respondents in the study were asked to identify the geographic location of their homes using four categories. “In a suburb” was selected as the home geographical location of 156 (38.7%) respondents. One hundred twenty-four (30.8%) respondents identified their home geographical location as “in a rural area, not on a farm.” Sixty-six

(16.4%) respondents identified “in a city” as their home geographical location. “On a farm or ranch” was identified by 41 (10.2%) respondents as their home geographical location. Thirteen (3.2%) respondents identified multiple locations as home geographical locations. Three (0.7%) respondents had no response (see Table 9).

Table 9

Classification of Home Geographical Location of Respondents

| | N | % |
|--------------------------------|-----|------|
| In a suburb | 156 | 38.7 |
| In a rural area, not on a farm | 124 | 30.8 |
| In a city | 66 | 16.4 |
| On a farm or ranch | 41 | 10.2 |
| Multiple locations | 13 | 3.2 |
| No response | 3 | .7 |

Agriculture-Related Work of Respondents

All respondents in the study were asked to identify if they had ever worked on a farm, ranch, or in an agricultural business, and if so, to identify the type of farm, ranch, or agricultural business. A complete listing of the type of farm, ranch, or agricultural business can be found in Appendix G. In addition, all respondents were asked to identify if they had relatives who live or work on a farm or ranch or who work in an agricultural business. One hundred fifteen (28.5%) respondents had worked on a farm or ranch, 287 (71.2%) respondents had not worked on a farm or ranch, and one (0.2%) respondent did not make a response. Forty-six (11.4%) respondents had worked in agribusiness, 356 (88.3%) respondents had not worked in agribusiness, and one (0.2%) respondent did not

respond. Two hundred one (49.9%) respondents had relatives that live or work on a farm, 200 (49.6%) respondents had relatives that do not live or work on a farm, and two (0.5%) respondents did not respond. One hundred thirty-three (33.0%) respondents had relatives that work in agribusiness, 267 (66.3%) respondents had relatives that do not work in agribusiness, and three (0.7%) respondents did not respond (see Table 10).

Table 10

Agriculture-Related Work of Respondents

| | Yes | | No | | No Response | |
|--------------------------------|-----|------|-----|------|-------------|----|
| | N | % | N | N | N | % |
| Work on farm-ranch | 115 | 28.5 | 287 | 71.2 | 1 | .2 |
| Work in agribusiness | 46 | 11.4 | 356 | 88.3 | 1 | .2 |
| Relatives live-work on farm | 201 | 49.9 | 200 | 49.6 | 2 | .5 |
| Relatives work in agribusiness | 133 | 33.0 | 267 | 66.3 | 3 | .7 |

Agriculture-Related Organizations Available to Respondents within their Communities

Respondents in the study were asked to identify those agriculture-related organizations that were available to them in their home communities using 11 choices. Two hundred four (50.6%) respondents identified that “4-H” was available within their community. One hundred thirty-four (33.3%) respondents identified that “FFA” was an organization available in their home community. One hundred ten (27.3%) respondents recognized “National Rifle Association” as an organization active in their community. Fifty-nine (14.6%) respondents knew about “Farm Bureau.” Fifty-six (13.9%) of the respondents did not select any of the choices listed. Twenty-two (5.5%) of the respondents were aware of “breed associations.” Nineteen (4.7%) of the respondents

knew about “Grange.” Eighteen (4.5%) respondents identified their awareness of the “National Beef Council” within their home community. Sixteen (4.0%) of the respondents knew that their community had an “ag cooperative.” Four (1.0%) of the respondents selected “Other” (see Appendix H). One hundred forty-five (36.0%) of the respondents were unsure about any agriculture-related organizations in their home community and selected “Don’t Know” (see Table 11).

Table 11

Agriculture-Related Organizations Available to Respondents within their Communities

| | Yes | | No | |
|----------------------------|-----|------|-----|------|
| | N | % | N | % |
| 4-H | 204 | 50.6 | 199 | 49.4 |
| FFA | 134 | 33.3 | 269 | 66.7 |
| National Rifle Association | 110 | 27.3 | 293 | 72.7 |
| Farm Bureau | 59 | 14.6 | 344 | 85.4 |
| None | 56 | 13.9 | 347 | 86.1 |
| Breed Associations | 22 | 5.5 | 381 | 94.5 |
| Grange | 19 | 4.7 | 384 | 95.3 |
| National Beef Council | 18 | 4.5 | 385 | 95.5 |
| Ag Cooperative | 16 | 4.0 | 387 | 96.0 |
| Other | 4 | 1.0 | 399 | 99.0 |
| Don't Know | 145 | 36.0 | 258 | 64.0 |

High School Agriculture Classes Taken by Respondents

All respondents in the study were asked to identify whether or not they participated in agriculture classes while in high school. Forty-eight (11.9%) respondents had participated in high school agriculture classes while 352 (87.3%) respondents did not take high school agriculture classes. Three (0.7%) respondents had no response (see Table 12).

Table 12

High School Agriculture Classes Taken by Respondents

| | N | % |
|-------------|-----|------|
| Yes | 48 | 11.9 |
| No | 352 | 87.3 |
| No Response | 3 | .7 |

High School Offered Agriculture Education Courses

All respondents in the study were asked to identify whether or not their high school offered agriculture education courses. If the students identified that they had taken agriculture courses while in high school they were instructed not to respond to this question, as it is inferred that to take an agriculture class in high school, the high school must offer the courses. One hundred twenty-four (30.8%) respondents went to a high school that offered agriculture education courses. Two hundred twenty-seven (56.3%) respondents attended a high school that did not offer agriculture education courses. Thirty-four (8.4%) respondents intentionally left the response blank and 18 (4.5%) respondents did not respond (see Table 13).

Table 13

High School Offered Agriculture Education Courses

| | N | % |
|--------------------------|-----|------|
| Yes | 124 | 30.8 |
| No | 227 | 56.3 |
| Intentionally Left Blank | 34 | 8.4 |
| No Response | 18 | 4.5 |

Member of FFA, 4-H, and Other Agricultural Organization

All respondents in the study were asked to identify whether or not they belonged to FFA, 4-H, or any other agricultural organization. Twenty-nine (7.2%) respondents were involved in FFA, 364 (90.3%) respondents were not involved in FFA, and 10 (2.5%) respondents did not respond to their FFA involvement. In reference to membership in a 4-H program, 60 (14.9%) respondents were involved, 342 (84.9%) respondents did not participate, and one (0.2%) respondent did not respond. Seventeen (4.2%) respondents were members of other agricultural organizations (see Appendix I), 382 (94.8%) of the respondents were not members of other agricultural organizations, and four (1.0%) respondents did not respond (see Table 14).

Table 14

Member of FFA, 4-H, and Other Agriculture Organization

| | Yes | | No | | No Response | |
|--|-----|------|-----|------|-------------|-----|
| | N | % | N | % | N | % |
| FFA member | 29 | 7.2 | 364 | 90.3 | 10 | 2.5 |
| 4-H member | 60 | 14.9 | 342 | 84.9 | 1 | .2 |
| Member other agricultural organization | 17 | 4.2 | 382 | 94.8 | 4 | 1.0 |

Involved in Agricultural Organization at West Virginia University

All respondents in the study were asked to identify those organizations, if any, in which they were involved in at West Virginia University. Twenty-six (6.5%) respondents were involved in agricultural organizations at West Virginia University (see Appendix J), 373 (92.6%) of the respondents were not involved, and four (1.0%) respondents did not respond (see Table 15).

Table 15

Involved in Agricultural Organization at West Virginia University

| | N | % |
|-------------|-----|------|
| Yes | 26 | 6.5 |
| No | 373 | 92.6 |
| No Response | 4 | 1.0 |

Definition of a Land Grant College by Respondents

All respondents in the study were asked to identify the definition which characterized a Land Grant University's mission of providing instruction primarily using

one of four options. The correct statement “agriculture, military tactics, the mechanic arts, and cooperative extension as well as classical studies” was selected by 133 (33.0%) respondents as that which defined a land grant college’s mission. One hundred seventeen (29.0%) of the respondents defined a land grant college’s mission as “research and development of sustainable and environmentally-friendly bio-based energy alternatives.” “Scientific research, education, training, and extension projects geared toward the conservation and practical use of U.S. coasts, the Great Lakes and other marine areas” was identified by 81 (20.1%) respondents as that which defined a land grant college. Thirty-two (7.9%) respondents defined a land grant college as instructing about “urban affairs and public policy.” Forty (9.9%) respondents did not respond (see Table 16).

Table 16

Definition of a Land Grant College by Respondents

| | N | % |
|--|-----|------|
| Agriculture, military tactics, the mechanic arts, and cooperative extension as well as classical studies | 133 | 33.0 |
| Research and development of sustainable and environmentally-friendly bio-based energy alternatives | 117 | 29.0 |
| Scientific research, education, training, and extension projects geared toward the conservation and practical use of U.S. coasts, the Great Lakes and other marine areas | 81 | 20.1 |
| urban affairs and public policy | 32 | 7.9 |
| No Response | 40 | 9.9% |

Knowledge of West Virginia University’s Association to Agriculture by Respondents

All respondents in the study were asked to identify whether or not they were aware that West Virginia University was a Land Grant College, operates several farms,

and is not the only Land Grant College in West Virginia. If their response was “Yes,” they were instructed to specify how they were made aware of these facts. One hundred thirty-nine (34.5%) respondents knew that WVU was a land grant college (see Appendix K) while 258 (64.0%) respondents identified they did not know and six (1.5%) respondents did not respond. One hundred ninety-three (47.9%) were aware that WVU owns and operates several farms (see Appendix L), 203 (50.4%) respondents indicated not knowing, and seven (1.7%) respondents did not respond. Thirty-eight (9.4%) respondents knew that WVU is not the only land grant college in West Virginia (see Appendix M), 357 (88.6%) did not know, and eight (2.0%) respondents failed to respond (see Table 17).

Table 17

Knowledge of West Virginia University’s Association to Agriculture by Respondents

| | Yes | | No | | No Response | |
|--|-----|------|-----|------|-------------|-----|
| | N | % | N | % | N | % |
| WVU is a Land Grant College | 139 | 34.5 | 258 | 64.0 | 6 | 1.5 |
| WVU operates several farms | 193 | 47.9 | 203 | 50.4 | 7 | 1.7 |
| WVU is not the only Land Grant College in WV | 38 | 9.4 | 357 | 88.6 | 8 | 2.0 |

Analysis of Agricultural Literacy Statements

Responses from all 403 student respondents were analyzed as one group. Additional analysis was performed after the main group was divided into sub-groups. The two additional sub-groups were identified using demographic data indicated by respondents on the instrument. Individuals who indicated that they “grew up on a farm or ranch,” had “ever worked on a farm or ranch,” and/or had “ever worked in an agricultural

business” were categorized as agricultural background respondents while all other respondents were grouped as non-agricultural background respondents. Individuals who indicated they were enrolled in a major within the Davis College of Agriculture, Forestry, and Consumer Sciences at WVU were categorized as Davis College respondents, while all other respondents who indicated their major as being in another college of WVU were grouped as Non-Davis College respondents. The responses indicated on the instrument for the agricultural knowledge and agricultural perceptions statements were analyzed using three groups: all Respondents, Davis College respondents versus Non-Davis College respondents, and agricultural background respondents versus non-agricultural background respondents.

Responses to Agricultural Knowledge Statements

Respondents in the study were instructed to select two answers for each of the thirty-five agricultural knowledge statements. If they believed the statement to be true, they were to circle “T,” or if they believed the statement to be false, they were to circle “F.” Based on their level of confidence in their answer, respondents were also instructed to circle “S” if they were sure their response was correct or “U” if they were unsure of their response. The questions were grouped into four categories: General Agricultural Knowledge, Agricultural Career Literacy, Agricultural Policy Literacy, and Environmental and Natural Resources Agricultural Literacy.

General Agricultural Knowledge

Within the General Agricultural Knowledge group, there were 13 statements. The first statement was “Animal health and nutrition are important to farmers,” to which three hundred sixty-six respondents (90.8%) indicated their response as true. Thirty

respondents (7.4%) selected false while seven respondents (1.7%) did not respond. Seventy-six respondents (18.9%) did not indicate their level of confidence in their response, while 257 respondents (63.8%) were sure of their answer and 70 respondents (17.4%) were unsure of their answer (see Table 18).

Two hundred ninety-nine respondents (74.2%) indicated the statement “Processing increases the cost of food production” was true while 18 individuals (4.5%) failed to respond to the statement. Eighty-six individuals (21.3%) felt the statement was false. One hundred seventy individuals (42.2%) were sure of their answer and 166 respondents (41.2%) indicated they were unsure of their response. Sixty-seven individuals (16.6%) did not rate their confidence in their answer (see Table 18).

“Plant products are the main source of human food,” received 240 respondents (59.6%) who indicated the statement was true while 13 individuals (3.2%) did not respond to the statement. One hundred fifty individuals (37.2%) identified the statement as false. One hundred forty-two individuals (35.2%) were certain of their answer while 191 respondents (47.7%) indicated they were uncertain of their response. Seventy individuals (17.4%) failed to rate their confidence in their answer (see Table 18).

Respondents were asked to evaluate the statement: “Animals can be a valuable source of medical products.” Two hundred seventy-eight respondents (69.0%) indicated the statement was true. One hundred five respondents (26.1%) selected false while 20 respondents (5.0%) did not respond. Sixty-seven respondents (16.6%) did not indicate their level of confidence in their response, while 140 respondents (34.7%) were sure of their answer and 196 respondents (48.6%) were unsure of their answer (see Table 18).

“Homogenization kills bacteria in milk with heat” was evaluated by the respondents. Two hundred twenty-two respondents (55.1%) indicated the statement was true while 34 individuals (8.4%) failed to respond to the statement. One hundred forty-seven individuals (36.5%) felt the statement was false. One hundred fifty-three individuals (38.0%) were sure of their answer and 149 respondents (48.1%) indicated they were unsure of their response. Fifty-six individuals (13.9%) did not rate their confidence in their answer (see Table 18).

Three hundred sixty-four respondents (90.3%) indicated the statement “thousands of people in the world die of starvation each year,” was true while nine individuals (2.2%) did not respond to the statement. Thirty individuals (7.4%) identified the statement as false. Two hundred fifty-five individuals (63.3%) were certain of their answer while 70 respondents (17.4%) indicated they were uncertain of their response. Seventy-eight individuals (19.4%) failed to rate their confidence in their answer (see Table 18).

Two hundred eighty-three respondents (70.2%) indicated the statement “Animals eat foodstuffs that cannot be digested by humans” was true. Ninety-nine respondents (24.6%) selected false while 21 respondents (5.2%) did not respond. Sixty-four respondents (15.9%) did not indicate their level of confidence in their response, while 168 respondents (41.7%) were sure of their answer and 171 respondents (42.2%) were unsure of their answer (see Table 18).

“New products have been developed using surplus grains” was evaluated by the respondents. Three hundred eleven respondents (77.2%) indicated the statement was true while 26 individuals (6.5%) failed to respond to the statement. Sixty-six individuals

(16.4%) felt the statement was false. One hundred ten individuals (27.3%) were sure of their answer and 231 respondents (57.3%) indicated they were unsure of their response. Sixty-two individuals (15.4%) did not rate their confidence in their answer (see Table 18).

One hundred eighty-one respondents (44.9%) indicated the statement “Grain exports are usually transported between continents by airplane” was true while 34 individuals (8.4%) did not respond to the statement. One hundred eighty-one individuals (46.7%) identified the statement as false. Ninety-nine individuals (24.6%) were certain of their answer while 252 respondents (62.5%) indicated they were uncertain of their response. Fifty-two individuals (12.9%) failed to rate their confidence in their answer (see Table 18).

Two hundred forty-eight respondents (61.5%) indicated “Biotechnology has increased animal production in the US” was a true statement. One hundred twenty-eight respondents (31.8%) selected false while 27 respondents (6.7%) did not respond. Sixty-two respondents (15.4%) did not indicate their level of confidence in their response, while 153 respondents (33.5%) were sure of their answer and 206 respondents (51.1%) were unsure of their answer (see Table 18).

Two hundred seventy-five respondents (68.2%) indicated the statement “Pasteurization kills bacteria in milk with heat” was true while 25 individuals (6.2%) failed to respond to the statement. One hundred three individuals (25.6%) felt the statement was false. One hundred seventy-eight individuals (44.2%) were sure of their answer and 164 respondents (40.7%) indicated they were unsure of their response. Sixty-one individuals (15.1%) did not rate their confidence in their answer (see Table 18).

Forty-five respondents (11.2%) indicated the statement “Hamburger is made from the meat of pigs” was true while 154 individuals (3.7%) did not respond to the statement. Three hundred forty-three individuals (85.1%) identified the statement as false. Two hundred fifty-three individuals (62.8%) were certain of their answer while 78 respondents (19.4%) indicated they were uncertain of their response. Seventy-two individuals (17.9%) failed to rate their confidence in their answer (see Table 18).

Three hundred sixteen respondents (78.4%) indicated the statement “Transportation and storage affects the supply of agricultural products” was true. Sixty-three respondents (15.6%) selected false while 24 respondents (6.0%) did not respond. Seventy respondents (17.4%) did not indicate their level of confidence in their response, while 180 respondents (44.7%) were sure of their answer and 153 respondents (38.0%) were unsure of their answer (see Table 18).

Table 18

Responses to Agricultural Knowledge Statements – General Agricultural Knowledge

| | No Response | | True | | False | | No Response | | Sure | | Unsure | |
|--|-------------|-----|------|------|-------|------|-------------|------|------|------|--------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Animal health and nutrition are important to farmers | 7 | 1.7 | 366 | 90.8 | 30 | 7.4 | 76 | 18.9 | 257 | 63.8 | 70 | 17.4 |
| Processing increases the cost of food products | 18 | 4.5 | 299 | 74.2 | 86 | 21.3 | 67 | 16.6 | 170 | 42.2 | 166 | 41.2 |
| Plant products are the main source of human foods | 13 | 3.2 | 240 | 59.6 | 150 | 37.2 | 70 | 17.4 | 142 | 35.2 | 191 | 47.4 |
| Animals can be a valuable source of medical products | 20 | 5.0 | 278 | 69.0 | 105 | 26.1 | 67 | 16.6 | 140 | 34.7 | 196 | 48.6 |
| Homogenization kills bacteria in milk with heat | 34 | 8.4 | 222 | 55.1 | 147 | 36.5 | 56 | 13.9 | 153 | 38.0 | 194 | 48.1 |
| Thousands of people in the world die of starvation each year | 9 | 2.2 | 364 | 90.3 | 30 | 7.4 | 78 | 19.4 | 255 | 63.3 | 70 | 17.4 |
| Animals eat foodstuffs that cannot be digested by humans | 21 | 5.2 | 283 | 70.2 | 99 | 24.6 | 64 | 15.9 | 168 | 41.7 | 171 | 42.4 |
| New products have been developed using surplus grains | 26 | 6.5 | 311 | 77.2 | 66 | 16.4 | 62 | 15.4 | 110 | 27.3 | 231 | 57.3 |

Table 18 (Continued)

Responses to Agricultural Knowledge Statements – General Agricultural Knowledge

| | No Response | | True | | False | | No Response | | Sure | | Unsure | |
|--|-------------|-----|------|------|-------|------|-------------|------|------|------|--------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Grain exports are usually transported between continents by airplane | 34 | 8.4 | 181 | 44.9 | 188 | 46.7 | 52 | 12.9 | 99 | 24.6 | 252 | 62.5 |
| Biotechnology has increased animal production in the US | 27 | 6.7 | 248 | 61.5 | 128 | 31.8 | 62 | 15.4 | 135 | 33.5 | 206 | 51.1 |
| Pasteurization kills bacteria in milk with heat | 25 | 6.2 | 275 | 68.2 | 103 | 25.6 | 61 | 15.1 | 178 | 44.2 | 164 | 40.7 |
| Hamburger is made from the meat of pigs | 15 | 3.7 | 45 | 11.2 | 343 | 85.1 | 72 | 17.9 | 253 | 62.8 | 78 | 19.4 |
| Transportation and storage affects the supply of agricultural products | 24 | 6.0 | 316 | 78.4 | 63 | 15.6 | 70 | 17.4 | 180 | 44.7 | 153 | 38.0 |

General Agricultural Knowledge Comparisons by Groups

The 403 student respondents were divided into two groups: Davis College Respondents ($n = 114$) and Non-Davis College Respondents ($n = 284$) for the first analysis. The 403 student respondents were divided into two different groups: agricultural background respondents ($n = 129$) and non-agricultural background respondents ($n = 274$) for the second analysis. A composite score was calculated by adding the responses to the 13 statements in this category (1 = correct answer 0 = incorrect answer). The t -test statistical procedures were used to determine if statistical differences existed in the means of each of the comparison groups for General Agricultural Knowledge (GAK). The following hypotheses were tested:

$$H_0 = M_{\text{Davis College GAK}} = M_{\text{Non-Davis College GAK}}$$

$$H_1 = M_{\text{Davis College GAK}} \neq M_{\text{Non-Davis College GAK}}$$

and

$$H_0 = M_{\text{Agricultural Background GAK}} = M_{\text{Non-Agricultural Background GAK}}$$

$$H_1 = M_{\text{Agricultural Background GAK}} \neq M_{\text{Non-Agricultural Background GAK}}$$

The maximum score possible for the 13 General Agricultural Knowledge statements was 13. A mean score of 9.08 ($SD = 2.25$) was calculated for all 403 respondents. The mean score of Davis College respondents was 9.90 ($SD = 2.30$). The mean score of Non-Davis College Respondents was 8.75 ($SD = 2.17$). The mean overall score of agricultural background respondents was 9.58 ($SD = 2.22$). The mean overall score of non-agricultural background respondents was 8.84 ($SD = 2.24$) (see Table 19).

Independent t -test statistical analysis procedures were used to compare the means of each of the two groups, Davis College and Non-Davis College respondents, and

agricultural and non-agricultural background respondents for General Agricultural Knowledge. The statistical analysis results (Davis/Non-Davis College: $t = 4.711$, $df = 396$; agricultural/non-agricultural background: $t = 3.116$, $df = 401$) were significant at $\alpha \leq 0.05$. Both null hypothesis were rejected and the research hypotheses, $H_1 = M_{\text{Davis College GAK}} \neq M_{\text{Non-Davis College GAK}}$ and $H_1 = M_{\text{Agricultural Background GAK}} \neq M_{\text{Non-Agricultural Background GAK}}$, were accepted. Davis College majors scored higher on the General Agricultural Knowledge statements than their Non-Davis College counterparts. Students with an agricultural background scored higher on the General Agricultural Knowledge statements than students without an agricultural background. The difference between the mean scores for General Agricultural Knowledge of the Davis College/Non-Davis College group exhibited a small effect size ($d = .23$) and the difference between the mean scores for General Agricultural Knowledge of the Agricultural/Non-Agricultural Background group also exhibited a small effect size ($d = .15$) (Cohen, 1988).

Table 19

General Agricultural Knowledge Scores

| | <i>N</i> | <i>M^l</i> | <i>SD</i> | <i>df</i> | <i>t</i> |
|---|----------|----------------------|-----------|-----------|----------|
| All Respondents | 403 | 9.08 | | | |
| Davis College Respondents | 114 | 9.90 | 2.30 | 396 | 4.711* |
| Non-Davis College Respondents | 284 | 8.75 | 2.17 | | |
| Agricultural Background Respondents | 129 | 9.58 | 2.22 | 401 | 3.946* |
| Non-Agricultural Background Respondents | 274 | 8.84 | 2.24 | | |

* $\alpha \leq 0.05$

^lMaximum score = 13

Agricultural Career Literacy

The group, Agricultural Career Literacy, contained five statements for the respondents to evaluate. Seventy-four respondents (18.4%) indicated the statement “There are more farmers in the US than there were 10 years ago” was true while 14 individuals (3.5%) failed to respond to the statement. Three hundred fifteen individuals (78.2%) felt the statement was false. One hundred and sixty-seven individuals (41.4%) were sure of their answer and 164 respondents (40.7%) indicated they were unsure of their response. Seventy-two individuals (17.9%) did not rate their confidence in their answer (see Table 20).

One hundred and thirty-nine respondents (34.5%) indicated the statement “Less than 3 percent of the US gross national product is from agriculture” was true while 23 individuals (5.7%) did not respond to the statement. Two hundred and forty-one individuals (59.8%) identified the statement as false. One hundred and twenty-two individuals (30.3%) were certain of their answer while 116 respondents (53.6%) indicated they were uncertain of their response. Sixty-five individuals (16.1%) failed to rate their confidence in their answer (see Table 20).

Two hundred thirty-three respondents (57.8%) indicated the statement “One of every five jobs in the US is related to agriculture” was true. One hundred forty-two respondents (35.2%) selected false while 28 respondents (6.9%) did not respond. Sixty-one respondents (15.1%) did not indicate their level of confidence in their response, while 105 respondents (26.1%) were sure of their answer and 237 respondents (58.8%) were unsure of their answer (see Table 20).

One hundred eighty-nine respondents (46.9%) indicated the statement “The average US farm is larger than 500 acres” was true while 31 individuals (7.7%) failed to

respond to the statement. One hundred eighty-three individuals (45.4%) felt the statement was false. One hundred ten individuals (27.3%) were sure of their answer and 237 respondents (58.8%) indicated they were unsure of their response. Fifty-six individuals (13.9%) did not rate their confidence in their answer (see Table 20).

“Profits increase as farmers strive for the maximum crop yields” received 254 respondents (63.0%) who indicated the statement was true while 23 individuals (5.7%) did not respond to the statement. One hundred twenty-six individuals (31.3%) identified the statement as false. One hundred forty-one individuals (35.0%) were certain of their answer while 197 respondents (48.9%) indicated they were uncertain of their response. Sixty-five individuals (16.1%) failed to rate their confidence in their answer (see Table 20).

Table 20

Responses to Agricultural Knowledge Statements – Agricultural Career Literacy

| | No Response | | True | | False | | No Response | | Sure | | Unsure | |
|--|-------------|-----|------|------|-------|------|-------------|------|------|------|--------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| There are more farmers in the US than there were 10 years ago | 14 | 3.5 | 74 | 18.4 | 315 | 78.2 | 72 | 17.9 | 167 | 41.4 | 164 | 40.7 |
| Less than 3 percent of the US gross national product is from agriculture | 23 | 5.7 | 139 | 34.5 | 241 | 59.8 | 65 | 16.1 | 122 | 30.3 | 216 | 53.6 |
| One of every five jobs in the US is related to agriculture | 28 | 6.9 | 233 | 57.8 | 142 | 35.2 | 61 | 15.1 | 105 | 26.1 | 237 | 58.8 |
| The average US farm is larger than 500 acres | 31 | 7.7 | 189 | 46.9 | 183 | 45.4 | 56 | 13.9 | 110 | 27.3 | 237 | 58.8 |
| Profits increase as farmers strive for the maximum crop yields | 23 | 5.7 | 254 | 63.0 | 126 | 31.3 | 65 | 16.1 | 141 | 35.0 | 197 | 48.9 |

Agricultural Career Literacy Comparisons by Groups

The 403 student respondents were divided into two groups: Davis College Respondents ($n = 114$) and Non-Davis College Respondents ($n = 284$) for the first analysis. The 403 student respondents were divided into two different groups: agricultural background respondents ($n = 129$) and non-agricultural background respondents ($n = 274$) for the second analysis. A composite score was calculated by adding the responses to the five statements in this category (1 = correct answer, 0 = incorrect answer). The t -test statistical procedures were used to determine if statistical differences existed in the means of each of the comparison groups for Agricultural Career Literacy (ACL). The following hypotheses were tested:

$$H_0 = M_{\text{Davis College ACL}} = M_{\text{Non-Davis College ACL}}$$

$$H_1 = M_{\text{Davis College ACL}} \neq M_{\text{Non-Davis College ACL}}$$

and

$$H_0 = M_{\text{Agricultural Background ACL}} = M_{\text{Non-Agricultural Background ACL}}$$

$$H_1 = M_{\text{Agricultural Background ACL}} \neq M_{\text{Non-Agricultural Background ACL}}$$

The maximum score possible for the true and false questions pertaining to the Agricultural Career Literacy statements was five and a mean score of 3.04 ($SD = 1.16$) was found for all 403 respondents. The mean overall score of Davis College respondents was 3.38 with a standard deviation of 1.21. The mean overall score of Non-Davis College respondents was 2.91 with a standard deviation of 1.11. The mean overall score of agricultural background respondents was 3.33 with a standard deviation of 1.12. The mean overall score of non-agricultural background respondents was 2.91 with a standard deviation of 1.16 (see Table 21).

Independent *t*-test statistical analysis procedures were used to compare the means of each of Davis College and Non-Davis College respondents and agricultural and non-agricultural background respondents for Agricultural Career Literacy. The statistical analysis results (Davis/Non-Davis College: $t = 3.536$, $df = 193$; Agricultural/Non-Agricultural Background: $t = 3.501$, $df = 401$) were significant at $\alpha \leq 0.05$. Both null hypothesis were rejected and the research hypotheses, $H_1 = M_{\text{Davis College ACL}} \neq M_{\text{Non-Davis College ACL}}$ and $H_1 = M_{\text{Agricultural Background ACL}} \neq M_{\text{Non-Agricultural Background ACL}}$, were accepted. Davis College majors scored higher on the Agricultural Career Literacy statements than their Non-Davis College counterparts. Students with an agricultural background scored higher on the Agricultural Career Literacy statements than students without an agricultural background. The difference between the mean scores for Agricultural Career Literacy of the Davis College/Non-Davis College group exhibited a small effect size ($d = .36$) and the difference between the mean scores for Agricultural Career Literacy of the agricultural/non-agricultural background group also exhibited a small effect size ($d = .32$) (Cohen, 1988).

Table 21

Agricultural Career Literacy Scores

| | <i>N</i> | <i>M</i> ¹ | <i>SD</i> | <i>df</i> | <i>t</i> |
|---|----------|-----------------------|-----------|-----------|----------|
| All Respondents | 403 | 3.04 | 1.16 | | |
| Davis College Respondents | 114 | 3.38 | 1.21 | 193 | 3.536* |
| Non-Davis College Respondents | 284 | 2.91 | 1.11 | | |
| Agricultural Background Respondents | 129 | 3.33 | 1.12 | 401 | 3.501* |
| Non-Agricultural Background Respondents | 274 | 2.91 | 1.16 | | |

* $\alpha \leq 0.05$ ¹Maximum score = 5*Agricultural Policy Literacy*

The third portion of Agricultural Knowledge Statements, Agricultural Policy Literacy, had a total of 10 statements to which students were to respond. Three hundred sixty-one respondents (89.6%) indicated the statement “Food safety is a major concern of the food processing industry” was true while five individuals (12%) did not respond to the statement. Thirty-seven individuals (9.2%) identified the statement as false. Two hundred fifty-seven individuals (63.8%) were certain of their answer while 68 respondents (16.9%) indicated they were uncertain of their response. Seventy-eight individuals (19.4%) failed to rate their confidence in their answer (see Table 22).

Three hundred fourteen respondents (77.9%) indicated “US research has improved farming methods in other countries” was true. Seventy respondents (17.4%) selected false while 19 respondents (4.7%) did not respond. Sixty-eight respondents (16.9%) did not indicate their level of confidence in their response, while 148

respondents (36.7%) were sure of their answer and 187 respondents (46.4%) were unsure of their answer (see Table 22).

Eighty-one respondents (20.1%) indicated the statement “The US does not sell its feed grains on the world market” was true while 28 individuals (6.9%) failed to respond to the statement. Two hundred ninety-four individuals (73.0%) felt the statement was false. Ninety-one individuals (22.6%) were sure of their answer and 251 respondents (62.3%) indicated they were unsure of their response. Sixty-one individuals (15.1%) did not rate their confidence in their answer (see Table 22).

Forty-seven respondents (11.7%) indicated the statement “Local laws and regulations have little effect on farmers” was true while 12 individuals (3.0%) did not respond to the statement. Three hundred forty-four individuals (85.4%) identified the statement as false. Two hundred eleven individuals (52.4%) were certain of their answer while 119 respondents (29.5%) indicated they were uncertain of their response. Seventy-three individuals (18.1%) failed to rate their confidence in their answer (see Table 22).

Two hundred eighty-four respondents (70.5%) indicated “US agricultural policies influence food prices in other countries” was true. Eighty-seven respondents (21.6%) selected false while 32 respondents (7.9%) did not respond. Sixty-three respondents (15.6%) did not indicate their level of confidence in their response, while 125 respondents (31.0%) were sure of their answer and 215 respondents (53.3%) were unsure of their answer (see Table 22).

Three hundred forty-six respondents (85.9%) indicated the statement “An efficient food distribution system is essential to the agriculture industry” was true while 12 individuals (3.0%) failed to respond to the statement. Forty-five individuals

(11.2%) felt the statement was false. Two hundred nine individuals (51.9%) were sure of their answer and 119 respondents (29.5%) indicated they were unsure of their response. Seventy-five individuals (18.6%) did not rate their confidence in their answer (see Table 22).

Three hundred fourteen respondents (77.9%) indicated the statement “Several countries depend on US agricultural exports for food and fiber” was true while 13 individuals (3.2%) did not respond to the statement. Seventy-six individuals (18.9%) identified the statement as false. One hundred eighty individuals (44.7%) were certain of their answer while 151 respondents (37.5%) indicated they were uncertain of their response. Seventy-two individuals (17.9%) failed to rate their confidence in their answer (see Table 22).

Two hundred fifty respondents (62.0%) indicated “Government subsidy payments to farmers are used to stabilize food prices” was true. One hundred twenty-five respondents (31.0%) selected false while 28 respondents (6.9%) did not respond. Sixty respondents (14.9%) did not indicate their level of confidence in their response, while 119 respondents (29.5%) were sure of their answer and 224 respondents (55.6%) were unsure of their answer (see Table 22).

One hundred forty-one respondents (35.0%) indicated the statement “Very little of the grain produced in the US is exported” was true while 28 individuals (6.9%) failed to respond to the statement. Two hundred thirty-four individuals (58.1%) felt the statement was false. One hundred two individuals (25.3%) were sure of their answer and 242 respondents (60.0%) indicated they were unsure of their response. Fifty-nine individuals (14.6%) did not rate their confidence in their answer (see Table 22).

Table 22

Responses to Agricultural Knowledge Statements – Agricultural Policy Literacy

| | No Response | | True | | False | | No Response | | Sure | | Unsure | |
|--|-------------|-----|------|------|-------|------|-------------|------|------|------|--------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Food safety is a major concern of the food processing industry | 5 | 1.2 | 361 | 89.6 | 37 | 9.2 | 78 | 19.4 | 257 | 63.8 | 68 | 16.9 |
| US research has improved farming methods in other countries | 19 | 4.7 | 314 | 77.9 | 70 | 17.4 | 68 | 16.9 | 148 | 36.7 | 187 | 46.4 |
| The US does not sell its feed grains on the world market | 28 | 6.9 | 81 | 20.1 | 294 | 73.0 | 61 | 15.1 | 91 | 22.6 | 251 | 62.3 |
| Local laws and regulations have little effect on farmers | 12 | 3.0 | 47 | 11.7 | 344 | 85.4 | 73 | 18.1 | 211 | 52.4 | 119 | 29.5 |
| US agricultural policies influence food prices in other countries | 32 | 7.9 | 284 | 70.5 | 87 | 21.6 | 63 | 15.6 | 125 | 31.0 | 215 | 53.3 |
| An efficient food distribution system is essential to the agriculture industry | 12 | 3.0 | 346 | 85.9 | 45 | 11.2 | 75 | 18.6 | 209 | 51.9 | 119 | 29.5 |
| Several countries depend on US agricultural exports for food and fiber | 13 | 3.2 | 314 | 77.9 | 76 | 18.9 | 72 | 17.9 | 180 | 44.7 | 151 | 37.5 |

Table 22 (Continued)

Responses to Agricultural Knowledge Statements – Agricultural Policy Literacy

| | No Response | | True | | False | | No Response | | Sure | | Unsure | |
|--|-------------|-----|------|------|-------|------|-------------|------|------|------|--------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Government subsidy payments to farmers are used to stabilize food prices | 28 | 6.9 | 250 | 62.0 | 125 | 31.0 | 60 | 14.9 | 119 | 29.5 | 224 | 55.6 |
| Very little of the grain produced in the US is exported | 28 | 6.9 | 141 | 35.0 | 234 | 58.1 | 59 | 14.6 | 102 | 25.3 | 242 | 60.0 |
| Using grain alcohol for fuel reduces the US dependence on foreign oil | 33 | 8.2 | 255 | 63.3 | 115 | 28.5 | 56 | 13.9 | 182 | 45.2 | 165 | 40.9 |

Two hundred fifty-five respondents (63.3%) indicated the statement “Using grain alcohol for fuel reduces the US dependence on foreign oil” was true while 33 individuals (8.2%) did not respond to the statement. One hundred fifteen individuals (28.5%) identified the statement as false. One hundred eighty-two individuals (45.2%) were certain of their answer while 165 respondents (40.9%) indicated they were uncertain of their response. Fifty-six individuals (13.9%) failed to rate their confidence in their answer (see Table 22).

Agricultural Policy Literacy Comparisons by Groups

The 403 student respondents were divided into two groups: Davis College Respondents ($n = 114$) and Non-Davis College Respondents ($n = 284$) for the first analysis. The 403 student respondents were divided into two different groups: agricultural background respondents ($n = 129$) and non-agricultural background respondents ($n = 274$) for a second analysis. A composite score was calculated by adding the responses to the ten statements in this category (1 = correct answer, 0 = incorrect answer). The t -test statistical procedures were used to determine if statistical differences existed in the means of each of the comparison groups for Agricultural Policy Literacy (APL). The following sets of hypotheses were tested:

$$H_0 = M_{\text{Davis College APL}} = M_{\text{Non-Davis College APL}}$$

$$H_1 = M_{\text{Davis College APL}} \neq M_{\text{Non-Davis College APL}}$$

and

$$H_0 = M_{\text{Agricultural Background APL}} = M_{\text{Non-Agricultural Background APL}}$$

$$H_1 = M_{\text{Agricultural Background APL}} \neq M_{\text{Non-Agricultural Background APL}}$$

The maximum score possible for the true and false questions pertaining to the Agricultural Policy Literacy statements was 10 and a mean score of 7.43 with a standard deviation of 1.97 was found for all 403 respondents. The mean overall score of Davis College Respondents was 8.01 with a standard deviation of 1.85. The mean overall score of Non-Davis College Respondents was 7.19 with a standard deviation of 1.99. The mean overall score of Agricultural Background Respondents was 7.85 with a standard deviation of 1.91. The mean overall score of Non-Agricultural Background Respondents was 7.24 with a standard deviation of 1.97 (see Table 23).

Independent *t*-test statistical analysis procedures were used to compare the means of each of the two groups, Davis College and Non-Davis College respondents, and agricultural and non-agricultural background respondents for Agricultural Policy Literacy. The statistical analysis results (Davis/Non-Davis College: $t = 3.888$, $df = 223$; Agricultural/Non-Agricultural Background: $t = 2.951$, $df = 401$) were significant at $\alpha \leq 0.05$. Both null hypothesis were rejected and the research hypotheses, $H_1 = M_{\text{Davis College APL}} \neq M_{\text{Non-Davis College APL}}$ and $H_1 = M_{\text{Agricultural Background APL}} \neq M_{\text{Non-Agricultural Background APL}}$, were accepted. Davis College majors scored higher on the Agricultural Policy Literacy statements than their Non-Davis College counterparts. Students with an agricultural background scored higher on the Agricultural Policy Literacy statements than students without an agricultural background. The difference between the mean scores for Agricultural Policy Literacy of the Davis College/Non-Davis College group exhibited a small effect size ($d = .22$) and the difference between the mean scores for Agricultural Policy Literacy of the Agricultural/Non-Agricultural Background group exhibited a small effect size ($d = .16$) (Cohen, 1988).

Table 23

Agricultural Policy Literacy Scores

| | <i>N</i> | <i>M</i> ¹ | <i>SD</i> | <i>df</i> | <i>t</i> |
|---|----------|-----------------------|-----------|-----------|----------|
| All Respondents | 403 | 7.43 | 1.97 | | |
| Davis College Respondents | 114 | 8.01 | 1.85 | 223 | 3.888* |
| Non-Davis College Respondents | 284 | 7.19 | 1.99 | | |
| Agricultural Background Respondents | 129 | 7.85 | 1.91 | 401 | 2.951* |
| Non-Agricultural Background Respondents | 274 | 7.24 | 1.97 | | |

* $\alpha \leq 0.05$ ¹Maximum score = 10*Environmental and Natural Resources Agricultural Literacy*

In the fourth group of Agricultural Knowledge Statements, Environmental and Natural Resources Agricultural Literacy, students were instructed to indicate responses to seven statements. The first statement was “Soil erosion does NOT pollute US lakes and rivers.” Fifty-nine respondents (14.6%) indicated their response as true. Three hundred thirty-five respondents (83.1%) selected false while nine respondents (2.2%) did not respond. Seventy-six respondents (18.9%) did not indicate their level of confidence in their response, while 216 respondents (53.6%) were sure of their answer and 111 respondents (27.5%) were unsure of their answer (see Table 24).

Two hundred eighty-eight respondents (71.5%) indicated the statement “The use of pesticides has increased the yield of crops” was true while 18 individuals (4.5%) failed to respond to the statement. Ninety-seven individuals (24.1%) felt the statement was false. One hundred forty-eight individuals (36.7%) were sure of their answer and 188

respondents (46.7%) indicated they were unsure of their response. Sixty-seven individuals (16.6%) did not rate their confidence in their answer (see Table 24).

Two hundred seventy-four respondents (68.0%) indicated the statement “Many farmers use tillage practices that conserve the soil” was true while 29 individuals (7.2%) did not respond to the statement. One hundred individuals (24.8%) identified the statement as false. One hundred individuals (24.8%) were certain of their answer while 244 respondents (60.5%) indicated they were uncertain of their response. Fifty-nine individuals (14.6%) failed to rate their confidence in their answer (see Table 24).

Ninety-one respondents (22.6%) indicated “Farming and wildlife cannot survive in the same geographic area” was true. Two hundred ninety-two respondents (72.5%) selected false while 20 respondents (5.0%) did not respond. Sixty-seven respondents (16.6%) did not indicate their level of confidence in their response, while 170 respondents (42.2%) were sure of their answer and 166 respondents (41.2%) were unsure of their answer (see Table 24).

Three hundred ten respondents (76.9%) indicated the statement “Biotechnology has increased the pest resistance of plants” was true while 25 individuals (6.2%) failed to respond to the statement. Sixty-eight individuals (16.9%) felt the statement was false. One hundred sixty-one individuals (40.0%) were sure of their answer and 181 respondents (44.9%) indicated they were unsure of their response. Sixty-one individuals (15.1%) did not rate their confidence in their answer (see Table 24).

Three hundred sixty-one respondents (89.6%) indicated the statement “Animal wastes are used to increase soil fertility,” was true while 13 individuals (3.2%) did not respond to the statement. Twenty-nine individuals (7.2%) identified the statement

as false. Two hundred thirty-two individuals (57.6%) were certain of their answer while 100 respondents (24.8%) indicated they were uncertain of their response. Seventy-one individuals (17.6%) failed to rate their confidence in their answer (see Table 24).

Three hundred sixty-six respondents (90.8%) indicated the statement “Water, soil, and minerals are important in agriculture” was true. Twenty-nine respondents (7.2%) selected false while eight respondents (2.0%) did not respond. Seventy-seven respondents (19.1%) did not indicate their level of confidence in their response, while 276 respondents (68.5%) were sure of their answer and 50 respondents (12.4%) were unsure of their answer (see Table 24).

Table 24

Responses to Agricultural Knowledge Statements – Environmental and Natural Resources Agricultural Literacy

| | No Response | | True | | False | | No Response | | Sure | | Unsure | |
|---|-------------|-----|------|------|-------|------|-------------|------|------|------|--------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Soil erosion does NOT pollute US lakes and rivers | 9 | 2.2 | 59 | 14.6 | 335 | 83.1 | 76 | 18.9 | 216 | 53.6 | 111 | 27.5 |
| The use of pesticides has increased the yield of crops | 18 | 4.5 | 288 | 71.5 | 97 | 24.1 | 67 | 16.6 | 148 | 36.7 | 188 | 46.7 |
| Many farmers use tillage practices that conserve the soil | 29 | 7.2 | 274 | 68.0 | 100 | 24.8 | 59 | 14.6 | 100 | 24.8 | 244 | 60.5 |
| Farming and wildlife cannot survive in the same geographic area | 20 | 5.0 | 91 | 22.6 | 292 | 72.5 | 67 | 16.6 | 170 | 42.2 | 166 | 41.2 |
| Biotechnology has increased the pest resistance of plants | 25 | 6.2 | 310 | 76.9 | 68 | 16.9 | 61 | 15.1 | 161 | 40.0 | 181 | 44.9 |
| Animal wastes are used to increase soil fertility | 13 | 3.2 | 361 | 89.6 | 29 | 7.2 | 71 | 17.6 | 232 | 57.6 | 100 | 24.8 |
| Water, soil, and minerals are important in agriculture | 8 | 2.0 | 366 | 90.8 | 29 | 7.2 | 77 | 19.1 | 276 | 68.5 | 50 | 12.4 |

Environmental and Natural Resources Agricultural Literacy Comparison by Groups

The 403 student respondents were divided into two groups: Davis College Respondents ($n = 114$) and Non-Davis College Respondents ($n = 284$) for the first analysis. The 403 student respondents were divided into two different groups: agricultural background respondents ($n = 129$) and non-agricultural background respondents ($n = 274$) for a second analysis. A composite score was calculated by adding the responses to the seven statements in this category (1 = correct answer, 0 = incorrect answer). The t -test statistical procedures were used to determine if statistical differences existed in the means of each of the comparison groups for Environmental and Natural Resources Agricultural Literacy (ENRAL). The following sets of hypotheses were tested:

$$H_0 = M_{\text{Davis College ENRAL}} = M_{\text{Non-Davis College ENRAL}}$$

$$H_1 = M_{\text{Davis College ENRAL}} \neq M_{\text{Non-Davis College ENRAL}}$$

and

$$H_0 = M_{\text{Agricultural Background ENRAL}} = M_{\text{Non-Agricultural Background ENRAL}}$$

$$H_1 = M_{\text{Agricultural Background ENRAL}} \neq M_{\text{Non-Agricultural Background ENRAL}}$$

The maximum score possible for the true and false questions pertaining to the Environmental and Natural Resources Agricultural Literacy statements was seven and a mean score of 5.52 with a standard deviation of 1.38 was found for all 403 respondents. The mean overall score of Davis College Respondents was 5.92 with a standard deviation of 1.21. The mean overall score of Non-Davis College Respondents was 5.36 with a standard deviation of 1.43. The mean overall score of Agricultural Background Respondents was 5.81 with a standard deviation of 1.20. The mean overall score of Non-

Agricultural Background Respondents was 5.39 with a standard deviation of 1.44 (see Table 25).

Independent *t*-test statistical analysis procedures were used to compare the means of each of the two groups, Davis College and Non-Davis College Respondents, and Agricultural and Non-Agricultural Background Respondents for Environmental and Natural Resources Agricultural Literacy. The statistical analysis results (Davis/Non-Davis College: $t = 4.007$, $df = 245$; Agricultural/Non-Agricultural Background: $t = 3.037$, $df = 297$) were significant at $\alpha \leq 0.05$. Both null hypothesis were rejected and the research hypotheses, $H_1 = M_{\text{Davis College ENRAL}} \neq M_{\text{Non-Davis College ENRAL}}$ and $H_1 = M_{\text{Agricultural Background ENRAL}} \neq M_{\text{Non-Agricultural Background ENRAL}}$, were accepted. Davis College majors scored higher on the Environmental and Natural Resources Agricultural Literacy statements than their Non-Davis College counterparts. Students with an agricultural background scored higher on the Environmental and Natural Resources Agricultural Literacy statements than students without an agricultural background. The difference between the mean scores for Environmental and Natural Resources Agricultural Literacy of the Davis College/Non-Davis College group exhibited a small effect size ($d = .30$) and the difference between the mean scores for Environmental and Natural Resources Agricultural Literacy of the Agricultural/Non-Agricultural Background group exhibited a small effect size ($d = .22$) (Cohen, 1988).

Table 25

Environmental and Natural Resources Agricultural Literacy Scores

| | <i>N</i> | <i>M</i> ¹ | <i>SD</i> | <i>df</i> | <i>t</i> |
|---|----------|-----------------------|-----------|-----------|----------|
| All Respondents | 403 | 5.52 | 1.38 | | |
| Davis College Respondents | 114 | 5.92 | 1.21 | 245 | 4.007* |
| Non-Davis College Respondents | 284 | 5.36 | 1.43 | | |
| Agricultural Background Respondents | 129 | 5.81 | 1.20 | 297 | 3.037* |
| Non-Agricultural Background Respondents | 274 | 5.39 | 1.44 | | |

* $\alpha \leq 0.05$ ¹Maximum score = 7*Overall Agricultural Literacy Scores*

An overall composite score for Agricultural Literacy was calculated by adding the responses to all 35 statements in this category (1 = correct answer, 0 = incorrect answer).

The 403 student respondents were divided into two groups: Davis College Respondents ($n = 114$) and Non-Davis College Respondents ($n = 284$) for the first analysis. The 403

student respondents were divided into two different groups: agricultural background respondents ($n = 129$) and non-agricultural background respondents ($n = 274$) for the

second analysis. The *t*-test statistical procedures were used to determine if statistical differences existed in the means of each of the comparison groups for Overall

Agricultural Literacy Scores. The following sets of hypotheses were tested:

$$H_0 = M_{\text{Davis College OAL}} = M_{\text{Non-Davis College OAL}}$$

$$H_1 = M_{\text{Davis College OAL}} \neq M_{\text{Non-Davis College OAL}}$$

and

$$H_0 = M_{\text{Agricultural Background OAL}} = M_{\text{Non-Agricultural Background OAL}}$$

$$H_1 = M_{\text{Agricultural Background OAL}} \neq M_{\text{Non-Agricultural Background OAL}}$$

The maximum score possible for all of the true and false questions (Overall Agricultural Literacy) was 35. The 403 respondents had a mean score of 24.31 with a standard deviation of 5.06. The mean overall score of Davis College Respondents was 26.39 with a standard deviation of 4.91. The mean overall score of Non-Davis College Respondents was 23.46 with a standard deviation of 4.92. The mean overall score of Agricultural Background Respondents was 25.73 with a standard deviation of 4.82. The mean overall score of Non-Agricultural Background Respondents was 23.64 with a standard deviation of 5.04 (see Table 26).

Independent *t*-test statistical analysis procedures were used to compare the means of each of the two groups, Davis College and Non-Davis College Respondents, and Agricultural and Non-Agricultural Background Respondents. The statistical analysis results (Davis/Non-Davis College: $t = 5.374$, $df = 396$; Agricultural/Non-Agricultural Background: $t = 3.946$, $df = 401$) were significant at $\alpha \leq 0.05$. Both null hypothesis were rejected and the research hypotheses, $H_1 = M_{\text{Davis College OAL}} \neq M_{\text{Non-Davis College OAL}}$ and $H_1 = M_{\text{Agricultural Background OAL}} \neq M_{\text{Non-Agricultural Background OAL}}$, were accepted. Davis College majors scored higher on the Overall Agricultural Literacy statements than their Non-Davis College counterparts. Students with an agricultural background scored higher on the Overall Agricultural Literacy statements than students without an agricultural background. The difference between the mean scores of the Davis College/Non-Davis College group exhibited a small ($d = .12$) effect size and the difference between the mean

scores of the Agricultural/Non-Agricultural Background group exhibited a small ($d = .08$) effect size (Cohen, 1988.)

Table 26

Overall Agricultural Literacy Scores

| | <i>N</i> | <i>M^l</i> | <i>SD</i> | <i>df</i> | <i>t</i> |
|---|----------|----------------------|-----------|-----------|----------|
| All Respondents | 403 | 24.31 | 5.06 | | |
| Davis College Respondents | 114 | 26.39 | 4.91 | 396 | 5.374* |
| Non-Davis College Respondents | 284 | 23.46 | 4.92 | | |
| Agricultural Background Respondents | 129 | 25.73 | 4.82 | 401 | 3.946* |
| Non-Agricultural Background Respondents | 274 | 23.64 | 5.04 | | |

* $\alpha \leq 0.05$

^lMaximum score = 35

Agricultural Knowledge Perceptions

Respondents in the study were asked to rate their opinion of 35 agricultural knowledge perceptions questions by using a Likert scale. Respondents were instructed to circle the letter that most accurately corresponded to their opinion on the scale which included 1 = Strongly Agree (SA), 2 = Agree (A), 3 = Neutral (N), 4 = Disagree (D), and 5 = Strongly Disagree (SD).

The first statement, “US citizens spend a higher percent of their income on food than in other countries,” received neutral responses from 33 students (8.2%) and three respondents (.7%) failed to provide a response. One hundred and forty-three respondents (35.5%) strongly agreed with the statement and 201 respondents (49.9%) agreed with the

statement. Nine respondents (2.2%) strongly disagreed with the statement and 14 respondents (3.5%) disagreed with the statement (see Table 27).

Respondents were asked to respond to “Agriculture employs a large number of people in this country.” Sixty-six respondents (16.4%) strongly agreed with the statement and 142 individuals (35.2%) agreed with the statement. Thirteen (3.2%) strongly disagreed with the statement and 73 respondents (18.1%) disagreed with the statement. One hundred five (26.1%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

Thirty-four respondents (8.4%) strongly agreed with the statement “Pesticides can be used safely when producing food” and 159 (39.5%) agreed with the statement. Seventy-nine (19.6%) strongly disagreed with the statement and 26 respondents (6.5%) disagreed with the statement. Ninety-nine (24.6%) respondents had neutral responses and six (1.5%) respondents failed to provide a response (see Table 27).

“Organic production methods are a realistic alternative to using pesticides” had 83 respondents (20.6%) who strongly agreed with the statement while 259 individuals (39.5%) agreed with the statement. Seven (1.7%) strongly disagreed with the statement and 29 respondents (7.2%) disagreed with the statement. One hundred twenty (29.8%) respondents had neutral responses and five (1.2%) respondents failed to provide a response (see Table 27).

“Confinement is an acceptable practice when raising livestock,” received neutral responses from 150 students (37.2%) and four respondents (1.0%) failed to provide a response. Nineteen respondents (4.7%) strongly agreed with the statement and 76 respondents (18.9%) agreed with the statement. Fifty-eight respondents (14.4%) strongly

disagreed with the statement and 96 respondents (23.8%) disagreed with the statement (see Table 27).

Forty-seven respondents (11.7%) strongly agreed with the statement “Consumers prefer processed foods to raw products” and 129 (32.0%) agreed with the statement. Twenty-eight (6.9%) strongly disagreed with the statement and 80 respondents (19.9%) disagreed with the statement. One hundred twelve (27.8%) respondents had neutral responses and seven (1.7%) respondents failed to provide a response (see Table 27).

“Developing countries need help to be able to store food safely” had 125 respondents (31.0%) who strongly agreed with the statement while 187 individuals (46.4%) agreed to the statement. Nineteen respondents (4.7%) disagreed with the statement. One hundred eighty-seven (46.4%) respondents had neutral responses and three (0.7%) respondents failed to provide a response (see Table 27).

“People are moving away from rural areas due to changes in agriculture,” received neutral responses from 143 students (35.5%) and five respondents (1.2%) failed to provide a response. Forty respondents (9.9%) strongly agreed with the statement and 132 respondents (32.8%) agreed with the statement. Fourteen respondents (3.5%) strongly disagreed with the statement and 69 respondents (17.1%) disagreed with the statement (see Table 27).

Seven respondents (1.7%) strongly agreed with the statement “Farmers earn too much money” and 16 (4.0%) agreed with the statement. One hundred twenty-five (31.0%) strongly disagreed with the statement and 158 respondents (39.2%) disagreed with the statement. Ninety-three (23.1%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

“Not all land is suitable for farming” found 152 respondents (37.7%) who strongly agreed with the statement while 204 individuals (50.6%) agreed with the statement. Four (1.0%) strongly disagreed with the statement and nine respondents (2.2%) disagreed with the statement. Two hundred four (50.6%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

“Biotechnology has increased the yield of crops in developing countries,” received neutral responses from 192 students (47.6%) and six respondents (1.5%) failed to provide a response. Forty-three respondents (10.7%) strongly agreed with the statement and 192 respondents (47.6%) agreed with the statement. Four respondents (1.0%) strongly disagreed with the statement and 19 respondents (4.7%) disagreed with the statement (see Table 27).

Thirty respondents (7.4%) strongly agreed with the statement “Farmers take good care of their animals,” and 140 (34.7%) agreed with the statement. Thirteen (3.2%) strongly disagreed with the statement and 35 respondents (8.7%) disagreed with the statement. One hundred eighty (44.7%) respondents had neutral responses and five (1.2%) respondents failed to provide a response (see Table 27).

“Processing adds value to farm products” had 21 respondents (5.2%) who strongly agreed with the statement while 133 individuals (33.0%) agreed to the statement. Eight (2.0%) strongly disagreed with the statement and 63 respondents (15.6%) disagreed with the statement. One hundred seventy-four (43.2%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

“Farmers should develop new and innovative marketing strategies,” received neutral responses from 141 students (35.0%) and four respondents (1.0%) failed to

provide a response. Thirty-seven respondents (9.2%) strongly agreed with the statement and 181 respondents (44.9%) agreed with the statement. Four respondents (1.0%) strongly disagreed with the statement and 36 respondents (8.9%) disagreed with the statement (see Table 27).

Thirty respondents (7.4%) strongly agreed with the statement “A strong agricultural industry is more important than military power” and 88 (21.8%) agreed with the statement. Forty-one (10.2%) strongly disagreed with the statement and 74 respondents (18.4%) disagreed with the statement. One hundred sixty-six (41.2%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

“Agricultural exports help to reduce the US trade deficit” received 36 respondents (8.9%) who strongly agreed with the statement while 167 individuals (41.4%) agreed to the statement. Four (1.0%) strongly disagreed with the statement and 30 respondents (7.4%) disagreed with the statement. One hundred sixty-six (41.2%) respondents had neutral responses (see Table 27).

“Agricultural practices are harmful to the environment,” received neutral responses from 148 students (36.7%). Nine respondents (2.2%) strongly agreed with the statement and 49 respondents (12.2%) agreed with the statement. Forty-eight respondents (11.9%) strongly disagreed with the statement and 149 respondents (37.0%) disagreed with the statement (see Table 27).

Twenty-six respondents (6.5%) strongly agreed with the statement “Raising hybrid plants results in higher yields” and 132 (32.8%) agreed with the statement. Six (1.5%) strongly disagreed with the statement and 28 respondents (6.9%) disagreed with

the statement. Two hundred eight (51.6%) respondents had neutral responses and three (0.7%) respondents failed to provide a response (see Table 27).

“Farmers are concerned about the humane treatment of animals” received 36 respondents (8.9%) who strongly agreed with the statement while 153 individuals (38.0%) agreed to the statement. Seven (1.7%) strongly disagreed with the statement and 71 respondents (17.6%) disagreed with the statement. One hundred thirty-four (33.3%) respondents had neutral responses and two (0.5%) respondents failed to provide a response (see Table 27).

“Processing food products is a benefit to consumers,” received neutral responses from 155 students (38.5%) and one respondent (0.2%) failed to provide a response. Thirty-three respondents (8.2%) strongly agreed with the statement and 141 respondents (35.0%) agreed with the statement. Twenty-one respondents (5.2%) strongly disagreed with the statement and 52 respondents (12.9%) disagreed with the statement (see Table 27).

Twenty three respondents (5.7%) strongly agreed with the statement “The US should allow free trade with other countries for food products” and 114 individuals (28.3%) agreed with the statement. Twenty-three (5.7%) strongly disagreed with the statement and 81 respondents (20.1%) disagreed with the statement. One hundred sixty-one (40.0%) respondents had neutral responses and one (0.2%) respondents failed to provide a response (see Table 27).

“The world food supply has increased as a result of improved technology” received 46 respondents (11.4%) who strongly agreed with the statement while 205 individuals (50.9%) agreed to the statement. Three (0.7%) strongly disagreed with the

statement and 51 respondents (12.7%) disagreed with the statement. Ninety-seven (24.1%) respondents had neutral responses and one (0.2%) respondents failed to provide a response (see Table 27).

“The US needs a steady supply of food and fiber products to remain strong,” received neutral responses from 78 students (19.4%) and two respondents (0.5%) failed to provide a response. Sixty-five respondents (16.1%) strongly agreed with the statement and 233 respondents (57.8%) agreed with the statement. Six respondents (1.5%) strongly disagreed with the statement and 19 respondents (4.7%) disagreed with the statement (see Table 27).

Thirty-eight respondents (9.4%) strongly agreed with the statement “Only organic methods should be used to produce food” and 71 (17.6%) agreed with the statement. Thirty (7.4%) strongly disagreed with the statement and 110 respondents (27.3%) disagreed with the statement. One hundred fifty-three (38.0%) respondents had neutral responses and one (0.2%) respondents failed to provide a response (see Table 27).

“Farmers should NOT use chemicals in crop production” received 45 respondents (11.2%) who strongly agreed with the statement while 103 individuals (25.6%) agreed to the statement. Sixteen (4.0%) strongly disagreed with the statement and 81 respondents (20.1%) disagreed with the statement. One hundred fifty-four (38.2%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

“Animals have the same rights as people,” received neutral responses from 130 students (32.3%) and four respondents (1.0%) failed to provide a response. Forty-three respondents (10.7%) strongly agreed with the statement and 83 respondents (20.6%)

agreed with the statement. Fifty-five respondents (13.6%) strongly disagreed with the statement and 88 respondents (21.8%) disagreed with the statement (see Table 27).

Forty respondents (9.9%) strongly agreed with the statement “Processing adds more to the cost of food than the raw product” and 161 (40.0%) agreed with the statement. Eight (2.0%) strongly disagreed with the statement and 40 respondents (9.9%) disagreed with the statement. One hundred forty-nine (37.0%) respondents had neutral responses and five (1.2%) respondents failed to provide a response (see Table 27).

“Farmers have no control over food prices” received 18 respondents (4.5%) who strongly agreed with the statement while 112 individuals (27.8%) agreed to the statement. Twenty (5.0%) strongly disagreed with the statement and 110 respondents (27.3%) disagreed with the statement. One hundred thirty-nine (34.5%) respondents had neutral responses and four (1.0%) respondents failed to provide a response (see Table 27).

“Developing countries lack the ability to produce enough food,” received neutral responses from 120 students (29.8%) and two respondents (0.5%) failed to provide a response. Forty-five respondents (11.2%) strongly agreed with the statement and 189 respondents (46.9%) agreed with the statement. Five respondents (1.2%) strongly disagreed with the statement and 42 respondents (10.4%) disagreed with the statement (see Table 27).

Eleven respondents (2.7%) strongly agreed with the statement “The government should exert more control over farming” and 74 (18.4%) agreed with the statement. Thirty-one (7.7%) strongly disagreed with the statement and 93 respondents (23.1%) disagreed with the statement. One hundred ninety-two (47.6%) respondents had neutral responses and two (0.5%) respondents failed to provide a response (see Table 27).

“Agriculture is the greatest polluter of our water supplies” received 21 respondents (5.2%) who strongly agreed with the statement while 59 individuals (14.6%) agreed to the statement. Fifty-five (13.6%) strongly disagreed with the statement and 128 respondents (31.8%) disagreed with the statement. One hundred thirty-nine (34.5%) respondents had neutral responses and one (0.2%) respondent failed to provide a response (see Table 27).

“Agriculture has become too mechanized,” received neutral responses from 184 students (45.7%) and one respondent (0.2%) failed to provide a response. Fourteen respondents (3.5%) strongly agreed with the statement and 64 respondents (15.9%) agreed with the statement. Twenty-three respondents (5.7%) strongly disagreed with the statement and 117 respondents (29.0%) disagreed with the statement (see Table 27).

Fourteen respondents (3.5%) strongly agreed with the statement “Animals should NOT be used for food” and 20 individuals (5.0%) agreed with the statement. One hundred ninety-eight (49.1%) strongly disagreed with the statement and 114 respondents (28.3%) disagreed with the statement. Fifty-four (13.4%) respondents had neutral responses and three (0.7%) respondents failed to provide a response (see Table 27).

“Farm grains are becoming an important energy source in the US” received 31 respondents (7.7%) who strongly agreed with the statement while 194 individuals (48.1%) agreed to the statement. Three (0.7%) strongly disagreed with the statement and 21 respondents (5.2%) disagreed with the statement. One hundred fifty-two (37.7%) respondents had neutral responses and two (0.5%) respondents failed to provide a response (see Table 27).

Table 27

Responses to Agricultural Perceptions Statements

| | No Response | | Strongly Agree | | Agree | | Neutral | | Disagree | | Strongly Disagree | |
|--|-------------|-----|----------------|------|-------|------|---------|------|----------|------|-------------------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| US citizens spend a higher percent of their income on food than in other countries | 3 | .7 | 143 | 35.5 | 201 | 49.9 | 33 | 8.2 | 14 | 3.5 | 9 | 2.2 |
| Agriculture employs a large number of people in this country | 4 | 1.0 | 66 | 16.4 | 142 | 35.2 | 105 | 26.1 | 73 | 18.1 | 13 | 3.2 |
| Pesticides can be used safely when producing food | 6 | 1.5 | 34 | 8.4 | 159 | 39.5 | 99 | 24.6 | 79 | 19.6 | 26 | 6.5 |
| Organic production methods are a realistic alternative to using pesticides | 5 | 1.2 | 83 | 20.6 | 159 | 39.5 | 120 | 29.8 | 29 | 7.2 | 7 | 1.7 |
| Confinement is an acceptable practice when raising livestock | 4 | 1.0 | 19 | 4.7 | 76 | 18.9 | 150 | 37.2 | 96 | 23.8 | 58 | 14.4 |
| Consumers prefer processed foods to raw products | 7 | 1.7 | 47 | 11.7 | 129 | 32.0 | 112 | 27.8 | 80 | 19.9 | 28 | 6.9 |
| Developing countries need help to be able to store food safely | 3 | .7 | 125 | 31.0 | 187 | 46.4 | 69 | 17.1 | 19 | 4.7 | 0 | 0.0 |

Table 27 (Continued)

Responses to Agricultural Perceptions Statements

| | No Response | | Strongly Agree | | Agree | | Neutral | | Disagree | | Strongly Disagree | |
|--|-------------|-----|----------------|------|-------|------|---------|------|----------|------|-------------------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| People are moving away from rural areas due to changes in agriculture | 5 | 1.2 | 40 | 9.9 | 132 | 32.8 | 143 | 35.5 | 69 | 17.1 | 14 | 3.5 |
| Farmers earn too much money | 4 | 1.0 | 7 | 1.7 | 16 | 4.0 | 93 | 23.1 | 158 | 39.2 | 125 | 31.0 |
| Not all land is suitable for farming | 4 | 1.0 | 152 | 37.7 | 204 | 50.6 | 30 | 7.4 | 9 | 2.2 | 4 | 1.0 |
| Biotechnology has increased the yield of crops in developing countries | 6 | 1.5 | 43 | 10.7 | 192 | 47.6 | 139 | 34.5 | 19 | 4.7 | 4 | 1.0 |
| Farmers take good care of their animals | 5 | 1.2 | 30 | 7.4 | 140 | 34.7 | 180 | 44.7 | 35 | 8.7 | 13 | 3.2 |
| Processing adds value to farm products | 4 | 1.0 | 21 | 5.2 | 133 | 33.0 | 174 | 43.2 | 63 | 15.6 | 8 | 2.0 |
| Farmers should develop new and innovative marketing strategies | 4 | 1.0 | 37 | 9.2 | 181 | 44.9 | 141 | 35.0 | 36 | 8.9 | 4 | 1.0 |
| A strong agricultural industry is more important than military power | 4 | 1.0 | 30 | 7.4 | 88 | 21.8 | 166 | 41.2 | 74 | 18.4 | 41 | 10.2 |
| Agricultural exports help to reduce the US trade deficit | 0 | 0.0 | 36 | 8.9 | 167 | 41.4 | 166 | 41.2 | 30 | 7.4 | 4 | 1.0 |

Table 27 (Continued)

Responses to Agricultural Perceptions Statements

| | No Response | | Strongly Agree | | Agree | | Neutral | | Disagree | | Strongly Disagree | |
|--|-------------|-----|----------------|------|-------|------|---------|------|----------|------|-------------------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Agricultural practices are harmful to the environment | 0 | 0.0 | 9 | 2.2 | 49 | 12.2 | 148 | 36.7 | 149 | 37.0 | 48 | 11.9 |
| Raising hybrid plants results in higher yields | 3 | .7 | 26 | 6.5 | 132 | 32.8 | 208 | 51.6 | 28 | 6.9 | 6 | 1.5 |
| Farmers are concerned about the humane treatment of animals | 2 | .5 | 36 | 8.9 | 153 | 38.0 | 134 | 33.3 | 71 | 17.6 | 7 | 1.7 |
| Processing food products is a benefit to consumers | 1 | .2 | 33 | 8.2 | 141 | 35.0 | 155 | 38.5 | 52 | 12.9 | 21 | 5.2 |
| The US should allow free trade with other countries for food products | 1 | .2 | 23 | 5.7 | 114 | 28.3 | 161 | 40.0 | 81 | 20.1 | 23 | 5.7 |
| The world food supply has increased as a result of improved technology | 1 | .2 | 46 | 11.4 | 205 | 50.9 | 97 | 24.1 | 51 | 12.7 | 3 | .7 |
| The US needs a steady supply of food and fiber products to remain strong | 2 | .5 | 65 | 16.1 | 233 | 57.8 | 78 | 19.4 | 19 | 4.7 | 6 | 1.5 |

Table 27 (Continued)

Responses to Agricultural Perceptions Statements

| | No Response | | Strongly Agree | | Agree | | Neutral | | Disagree | | Strongly Disagree | |
|---|-------------|-----|----------------|------|-------|------|---------|------|----------|------|-------------------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Only organic methods should be used to produce food | 1 | .2 | 38 | 9.4 | 71 | 17.6 | 153 | 38.0 | 110 | 27.3 | 30 | 7.4 |
| Farmers should NOT use chemicals in crop production | 4 | 1.0 | 45 | 11.2 | 103 | 25.6 | 154 | 38.2 | 81 | 20.1 | 16 | 4.0 |
| Animals have the same rights as people | 4 | 1.0 | 43 | 10.7 | 83 | 20.6 | 130 | 32.3 | 88 | 21.8 | 55 | 13.6 |
| Processing adds more to the cost of food than the raw product | 5 | 1.2 | 40 | 9.9 | 161 | 40.0 | 149 | 37.0 | 40 | 9.9 | 8 | 2.0 |
| Farmers have no control over food prices | 4 | 1.0 | 18 | 4.5 | 112 | 27.8 | 139 | 34.5 | 110 | 27.3 | 20 | 5.0 |
| Developing countries lack the ability to produce enough food | 2 | .5 | 45 | 11.2 | 189 | 46.9 | 120 | 29.8 | 42 | 10.4 | 5 | 1.2 |
| The government should exert more control over farming | 2 | .5 | 11 | 2.7 | 74 | 18.4 | 192 | 47.6 | 93 | 23.1 | 31 | 7.7 |
| Agriculture is the greatest polluter of our water supplies | 1 | .2 | 21 | 5.2 | 59 | 14.6 | 139 | 34.5 | 128 | 31.8 | 55 | 13.6 |

Table 27 (Continued)

Responses to Agricultural Perceptions Statements

| | No Response | | Strongly Agree | | Agree | | Neutral | | Disagree | | Strongly Disagree | |
|--|-------------|----|----------------|------|-------|------|---------|------|----------|------|-------------------|------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Agriculture has become too mechanized | 1 | .2 | 14 | 3.5 | 64 | 15.9 | 184 | 45.7 | 117 | 29.0 | 23 | 5.7 |
| Animals should NOT be used for food | 3 | .7 | 14 | 3.5 | 20 | 5.0 | 54 | 13.4 | 114 | 28.3 | 198 | 49.1 |
| Farm grains are becoming an important energy source in the US | 2 | .5 | 31 | 7.7 | 194 | 48.1 | 152 | 37.7 | 21 | 5.2 | 3 | .7 |
| Developing countries need help in distributing food among needy people | 2 | .5 | 79 | 19.6 | 206 | 51.1 | 94 | 23.3 | 12 | 3.0 | 10 | 2.5 |

“Developing countries need help in distributing food among needy people,” received neutral responses from 94 students (23.3%) and two respondents (0.5%) failed to provide a response. Seventy-nine respondents (19.6%) strongly agreed with the statement and 206 respondents (51.1%) agreed with the statement. Ten respondents (2.5%) strongly disagreed with the statement and 12 respondents (3.0%) disagreed with the statement (see Table 27).

Agricultural Literacy Perception Scores

The 403 student respondents were divided into two groups: Davis College Respondents ($n = 114$) and Non-Davis College Respondents ($n = 284$) for the first analysis. The 403 student respondents were divided into two different groups: agricultural background respondents ($n = 129$) and non-agricultural background respondents ($n = 274$) for the second analysis. A composite score was calculated by averaging the responses to the 35 statements in this category. The t -test statistical procedures were used to determine if statistical differences existed in the means of each of the comparison groups for Agricultural Literacy Perceptions (ALP). The following sets of hypotheses were tested:

$$H_0 = M_{\text{Davis College ALP}} = M_{\text{Non-Davis College ALP}}$$

$$H_1 = M_{\text{Davis College ALP}} \neq M_{\text{Non-Davis College ALP}}$$

and

$$H_0 = M_{\text{Agricultural Background ALP}} = M_{\text{Non-Agricultural Background ALP}}$$

$$H_1 = M_{\text{Agricultural Background ALP}} \neq M_{\text{Non-Agricultural Background ALP}}$$

The Agricultural Literacy Perceptions portion of the instrument consisted of 35 statements. Respondents were directed to rate their responses to the statements using a

Likert scale ranging from Strongly Agree (1) to Agree (2) to Neutral (3) to Disagree (4) to Strongly Disagree (5). A mean score of 2.67 with a standard deviation of 0.28 was found for all 403 respondents. The mean score of Davis College Respondents was 2.55 with a standard deviation of 0.29. The mean overall score of Non-Davis College Respondents was 2.71 with a standard deviation of 0.26. The mean overall score of Agricultural Background Respondents was 2.58 with a standard deviation of 0.32. The mean overall score of Non-Agricultural Background Respondents was 2.71 with a standard deviation of 0.26 (see Table 28).

Independent *t*-test statistical analysis procedures were used to compare the means of each of the two groups, Davis College and Non-Davis College Respondents, and Agricultural and Non-Agricultural Background Respondents for Agricultural Literacy Perceptions. The statistical analysis results (Davis/Non-Davis College: $t = -5.569$, $df = 396$; Agricultural/Non-Agricultural Background: $t = -4.046$, $df = 200$) were significant at $\alpha \leq 0.05$. Both null hypothesis were rejected and the research hypotheses, $H_1 = M_{\text{Davis College ALP}} \neq M_{\text{Non-Davis College ALP}}$ and $H_1 = M_{\text{Agricultural Background ALP}} \neq M_{\text{Non-Agricultural Background ALP}}$, were accepted. Davis College majors scored higher on the Agricultural Literacy Perceptions statements than their Non-Davis College counterparts. Students with an agricultural background scored higher on the Agricultural Literacy Perceptions statements than students without an agricultural background. The difference between the mean scores for Agricultural Literacy Perceptions of the Davis College/Non-Davis College group exhibited a large effect size and the difference between the mean scores for Agricultural Literacy Perceptions of the Agricultural/Non-Agricultural Background group exhibited a large effect size (Cohen, 1988.)

Table 28

Agricultural Literacy Perceptions Scores

| | <i>N</i> | <i>M</i> ^l | <i>SD</i> | <i>df</i> | <i>t</i> |
|---|----------|-----------------------|-----------|-----------|----------|
| All Respondents | 403 | 2.67 | 0.28 | | |
| Davis College Respondents | 114 | 2.55 | 0.29 | 396 | -5.569* |
| Non-Davis College Respondents | 284 | 2.71 | 0.26 | | |
| Agricultural Background Respondents | 129 | 2.58 | 0.32 | 200 | -4.046* |
| Non-Agricultural Background Respondents | 274 | 2.71 | 0.25 | | |

* $\alpha \leq 0.05$ ^lScore Range = 1-5

CHAPTER V

Summary, Conclusions, and Recommendations

Purpose of the Study

The purpose of this research study was to determine the knowledge of agriculture possessed by incoming freshmen at West Virginia University. Accessible first year students from all majors and colleges within West Virginia University completed a questionnaire which assessed and provided data that illustrated their knowledge of general agricultural related topics.

Objectives of the Study:

The specific objectives of this study were as follows:

- 1) To assess the level of knowledge of agriculture incoming freshmen possess;
- 2) To compare the results of knowledge possessed by students with an agricultural background to those students with no agricultural background; and
- 3) To assess and compare the level of knowledge possessed by students as a collective body from non-agricultural colleges against those students from the agriculture college of West Virginia University.

Summary

Less than one-third (28.3%) of the study participants were enrolled in agricultural majors in the Davis College of Agriculture, Forestry, and Consumer Sciences at West Virginia University and less than one-third (28.5%) of the respondents had worked on a farm or ranch. Student demographic data also revealed that slightly more than one-tenth (11.9%) of respondents were enrolled in agriculture classes while in high school and that 39.2% of respondents' high schools offered agriculture classes. Slightly over 10%

(10.2%) of respondents grew up on a farm or ranch, while over half (55.1%) of the respondents grew up in a city or suburb. Just over one-tenth (11.4%) of respondents had worked in an agribusiness. When asked if they or a family members had lived or worked on a farm or ranch or worked in an agribusiness, nearly half (49.9%) indicated they or a family member had lived or worked on a farm or ranch while one-third (33.0%) had either worked in an agribusiness or had a family member work in an agribusiness.

When asked about agriculture-related organizations, just over half (50.6%) of respondents identified 4-H as a program available to them in their community. Over one-third of the respondents (36.0%) did not know what agriculture-related organizations were available in their community. Between 4% and 33.5% of respondents indicated being aware of any of the other choices listed on the questionnaire. Less than one-sixth of the respondents indicated any involvement in agriculture-related organizations such as 4-H (14.9%), FFA (7.2%), or other organizations in high school (4.2%) or college (6.5%).

One-third (33.0%) of respondents correctly identified the definition of a Land Grant University, slightly more than one-third (34.5%) of respondents were aware that WVU is a Land Grant University, and slightly less than one-half (47.9%) were aware that WVU owns and operates several farms. Less than ten percent (9.4%) of students were aware that WVU is not the only Land Grant University in the state of West Virginia.

In the agricultural literacy portion of the instrument, respondents with a major in the Davis College had average scores ($M = 26.39$) higher than individuals with majors outside of the Davis College ($M = 23.46$). Respondents with an agricultural background had higher mean scores in the agricultural literacy portion of the instrument ($M = 25.73$)

than students without an agricultural background ($M = 23.64$). Similar differences between Davis and non-Davis students and students with agricultural backgrounds and students without agricultural backgrounds were found when the agricultural literacy portion of the instrument was divided into General Agricultural Knowledge, Agricultural Career Literacy, Agricultural Policy Literacy, and Environmental and Natural Resources Agricultural Literacy sections. For each of the four sections, the average scores of Davis College majors were statistically higher than the scores for students with majors outside the college. Students with an agricultural background had statistically higher scores than students who did not have an agricultural background.

Thirty-five Likert scale Agricultural Literacy Perceptions statements were included in the instrument. A lower score indicated a more positive perception of agriculture while a higher score indicated a more negative perception of agriculture. The 403 respondents expressed agreement ($M = 2.67$) with the agricultural literacy perceptions. Davis College respondents ($M = 2.55$) expressed stronger agreement than their Non-Davis College counterparts ($M = 2.71$). Respondents with an agricultural background also expressed a stronger agreement ($M = 2.58$) on the items than Non-Agricultural Background respondents ($M = 2.71$).

Conclusions

Because of data collection procedures used in the study, it was not possible for the researcher to generalize the results of this study to include individuals outside of the 403 student respondents from West Virginia University. Based on the major findings which resulted from this study, the following conclusions about agricultural literacy were reached for the 403 student respondents from West Virginia University.

1. Freshmen students at West Virginia University possess limited knowledge and understanding of the agricultural industry as a whole.
2. Students with a background in agriculture had higher levels of knowledge and perceptions of agriculture.
3. Those freshmen respondents who are enrolled in a major within the Davis College of Agriculture, Forestry, and Consumer Sciences at West Virginia University exhibit increased levels of agricultural knowledge and perceptions.
4. Although statistically significant differences were found between those freshmen students who have had a greater exposure to agriculture-related experiences and those freshmen who lack such interactions, the researcher failed to establish a practical significance between the scores because the overall scores indicated a limited level of agricultural literacy of behalf of all freshmen respondents.

Discussion

The findings presented as a result of this researchers efforts are not vastly different than those identified by various other researchers striving to alter the deficit of agricultural illiteracy in today's society. Two individual's research efforts were closely identifiable with this researcher's study. Frick (2005) and Riedel (2006) both used similar instruments in their research.

Riedel (2006) noted an overall agricultural literacy score of 24.13 with a standard deviation of 6.85, while this researcher found the 403 respondents in this study to have a mean score of 24.31 with a standard deviation of 5.06. In relation to perceptions of agriculture, Riedel's study identified a score of 93 out of 175, or a score of 2.66 out of five, while this researcher's findings displayed a 2.67 out of five, where anything less

than three is recognized as reflecting positive attitudes about agriculture and anything greater than three represents more negative attitudes about agriculture.

When comparing Frick's study with this researcher's study, a comparison between students with an agricultural background/without an agricultural background and rural high school students/inner-city high school students can be discussed. The overall agricultural knowledge scores of rural high school students in Frick's study was 22.77 out of 35 and 16.95 out of 35 for inner-city high school students. This researcher's results for agricultural background students found a mean score of 25.73 out of 35 and 23.64 out of 35 for non-agricultural background students. When considering the perceptions scores for these groups, Frick's rural high school student population scored a mean of 83.90 out of 175, or 2.40 out of five and his inner-city high school population scored a mean of 85.79 out of 175, or 2.45 out of five. The mean scores for the agricultural background respondents and non-agricultural background respondents in this research effort found mean scores of 2.58 and 2.71 out of five for these two groups, respectively. Although this researcher's scores do not appear as significant as those found by Frick (2005), an obvious difference is apparent between individuals who have an association to a rural and/or agricultural setting and those who lack such interaction.

Recommendations

The information gathered herein focuses on the ever expanding challenge facing today's agricultural education profession. While utilizing insight gained from available research trends of agricultural literacy, the researcher's opinions developed throughout the process of this study, and the major findings which resulted from this study, the recommendations that follow have been developed.

1. Focusing efforts on developing and implementing educational programs to increase literacy of agriculture among people of all backgrounds and ages is critical. Beginning in elementary school and continuing throughout all levels of education and societal involvement, programs which inform individuals about their connection to agriculture would result in a society better equipped with basic agricultural knowledge and skills.
2. Land Grant Universities should better preserve and promote their reason for inception through education of those students enrolled in the Universities. The purpose of their development was to provide education primarily in agriculture, military tactics, the mechanic arts, and cooperative extension as well as classical studies. Limited awareness of this fact by freshmen students indicates a gap between meeting the student's desired goals of attending a Land Grant University and the mission of the Land Grant University.
3. Two decades have passed since the National Research Council Committee on Agricultural Education identified the serious nature surrounding the depressed state of agricultural literacy in our country's school systems. Numerous other studies, past and present, including this researcher's findings, have pointed towards an obvious need for change in the level of agricultural awareness among individuals. A more comprehensive form of analysis and attempt to increase agricultural literacy should be enacted to influence positive changes in the current literacy status.

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APPENDICES

APPENDIX A

*Email Correspondence with West Virginia University First Year Experience Orientation
Instructors*

Dear Orientation Course Instructor:

I am in the process of conducting research on "agricultural awareness and perceptions of freshmen students at West Virginia University." The results of this study will be used to prepare a thesis to partially fulfill the requirements for a Master of Science Degree in Agricultural and Extension Education.

Currently, I have had tremendous support by instructors of a number of University 101 courses and Orientation courses, including Dr. Hillar Klandorf, Resident Faculty Leader for Lyon Tower, and Dr. Stacy Gartin, Professor and Chair, Agricultural and Extension Education, who have allowed me to administer my questionnaire during their scheduled class time.

In order to reach my target population and complete my research project, I need your help. Will you provide me with similar access to the students in your Orientation class(es)? I estimate that I will need approximately 15 minutes during one class session for students to complete the questionnaire. I have found that it works best if I provide the questionnaires, complete with a cover letter including instructions on how to complete the questionnaire, to the instructors who can then administer them at the end of the class, or at their convenience, so as to minimize the amount of "dead time" during class. I can also administer the questionnaires myself during the beginning of class. The questionnaires must be completed by students during the Fall 2007 semester.

Your participation is vital to the success of this research endeavor. I encourage you to contact me with any questions or concerns you might have regarding my research, as well as with an indication of your decision in assisting me. I look forward to working with you on this project. Thank you for your time and consideration!

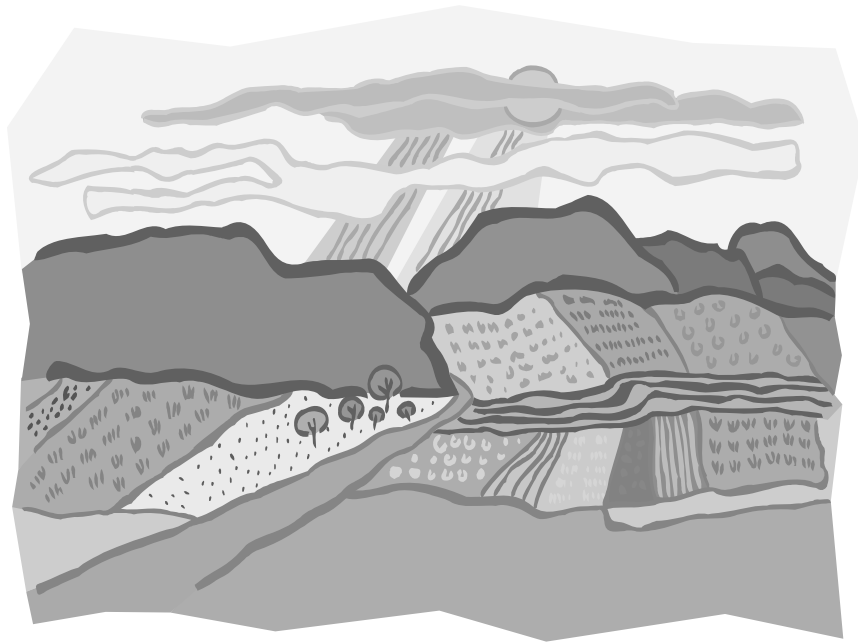
Sincerely,

Laura L. Pfeifer
Graduate Student

APPENDIX B

Questionnaire

Agricultural Awareness and Perceptions of Freshmen at West Virginia University



Laura L. Pfeifer
Graduate Student
Agricultural and Extension Education
Davis College of Agriculture, Forestry, and Consumer Sciences
West Virginia University
Morgantown, WV 26506

Agricultural Awareness and Perceptions of Freshmen at West Virginia University

Instructions: Read each of the following statements and indicate your response by circling “T” if you think the statement is TRUE or circling “F” if you think the statement is FALSE. If you are sure your response is correct, circle “S.” If you are unsure about your response, circle “U.” You should have two responses for each statement.

Example: Read the following statement in the grey box. Assume that you know that U.S. farms are larger than European farms and you are certain of your answer. Circle “F” for your answer and “S” for your confidence level.

| | | | | |
|--|---|------------------------------------|------------------------------------|---|
| U.S. farms are smaller than those in Europe. | T | <input checked="" type="radio"/> F | <input checked="" type="radio"/> S | U |
|--|---|------------------------------------|------------------------------------|---|

| Statement | True | False | Sure | Unsure |
|--|------|-------|------|--------|
| 1. There are more farmers in the U.S. than there were 10 years ago. | T | F | S | U |
| 2. Less than 3 percent of the U.S. gross national product is from agriculture. | T | F | S | U |
| 3. Soil erosion does NOT pollute U.S. lakes and rivers. | T | F | S | U |
| 4. The use of pesticides has increased the yield of crops. | T | F | S | U |
| 5. Animal health and nutrition are important to farmers. | T | F | S | U |
| 6. Food safety is a major concern of the food processing industry. | T | F | S | U |
| 7. Processing increases the cost of food products. | T | F | S | U |
| 8. U.S. research has improved farming methods in other countries. | T | F | S | U |
| 9. One of every five jobs in the U.S. is related to agriculture. | T | F | S | U |
| 10. Many farmers use tillage practices that conserve the soil. | T | F | S | U |

| | | | | |
|---|---|---|---|---|
| 11. Plant products are the main source of human foods. | T | F | S | U |
| 12. Animals can be a valuable source of medical products. | T | F | S | U |
| 13. Homogenization kills bacteria in milk with heat. | T | F | S | U |
| 14. The U.S. does not sell its feed grains on the world market. | T | F | S | U |
| 15. Thousands of people in the world die of starvation each year. | T | F | S | U |
| 16. Local laws and regulations have little effect on farmers. | T | F | S | U |
| 17. Farming and wildlife cannot survive in the same geographic area. | T | F | S | U |
| 18. Biotechnology has increased the pest resistance of plants. | T | F | S | U |
| 19. Animals eat foodstuffs that cannot be digested by humans. | T | F | S | U |
| 20. New products have been developed using surplus grains. | T | F | S | U |
| 21. Grain exports are usually transported between continents by airplane. | T | F | S | U |
| 22. The average U.S. farm is larger than 500 acres. | T | F | S | U |
| 23. U.S. agricultural policies influence food prices in other countries. | T | F | S | U |
| 24. Animal wastes are used to increase soil fertility. | T | F | S | U |
| 25. Profits increase as farmers strive for the maximum crop yields. | T | F | S | U |
| 26. Biotechnology has increased animal production in the U.S. | T | F | S | U |
| 27. Pasteurization kills bacteria in milk with heat. | T | F | S | U |

| | | | | |
|---|---|---|---|---|
| 28. An efficient food distribution system is essential to the agriculture industry. | T | F | S | U |
| 29. Several countries depend on U.S. agricultural exports for food and fiber. | T | F | S | U |
| 30. Government subsidy payments to farmers are used to stabilize food prices. | T | F | S | U |
| 31. Water, soil, and minerals are important in agriculture. | T | F | S | U |
| 32. Very little of the grain produced in the U.S. is exported. | T | F | S | U |
| 33. Hamburger is made from the meat of pigs. | T | F | S | U |
| 34. Using grain alcohol for fuel reduces the U.S. dependence on foreign oil. | T | F | S | U |
| 35. Transportation and storage affects the supply of agricultural products. | T | F | S | U |

Instructions: Using the following Likert scale, rate your opinion on each of the following agriculture-related statements. Indicate your opinion by circling the letters that best correspond to your response: SA – Strongly Agree, A – Agree, N – Neutral, D – Disagree, SD – Strongly Disagree.

Example: Read the following statement in the grey box. Assume that you strongly disagree with the statement that ‘All farmers live beyond their means.’ Circle “SD” to indicate this opinion.

| | | | | | |
|--------------------------------------|----|---|---|---|----|
| All farmers live beyond their means. | SA | A | N | D | SD |
|--------------------------------------|----|---|---|---|----|

| Statement | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|---|----------------|-------|---------|----------|-------------------|
| 36. U.S. citizens spend a higher percent of their income on food than in other countries. | SA | A | N | D | SD |
| 37. Agriculture employs a large number of people in this country. | SA | A | N | D | SD |
| 38. Pesticides can be used safely when producing food. | SA | A | N | D | SD |
| 39. Organic production methods are a realistic alternative to using pesticides. | SA | A | N | D | SD |
| 40. Confinement is an acceptable practice when raising livestock. | SA | A | N | D | SD |
| 41. Consumers prefer processed foods to raw products. | SA | A | N | D | SD |
| 42. Developing countries need help to be able to store food safely. | SA | A | N | D | SD |
| 43. People are moving away from rural areas due to changes in agriculture. | SA | A | N | D | SD |
| 44. Farmers earn too much money. | SA | A | N | D | SD |
| 45. Not all land is suitable for farming. | SA | A | N | D | SD |
| 46. Biotechnology has increased the yield of crops in developing countries. | SA | A | N | D | SD |
| 47. Farmers take good care of their animals. | SA | A | N | D | SD |
| 48. Processing adds value to farm products. | SA | A | N | D | SD |
| 49. Farmers should develop new and innovative marketing strategies. | SA | A | N | D | SD |
| 50. A strong agricultural industry is more important than military power. | SA | A | N | D | SD |

| | | | | | |
|---|----|---|---|---|----|
| 51. Agricultural exports help to reduce the U.S. trade deficit. | SA | A | N | D | SD |
| 52. Agricultural practices are harmful to the environment. | SA | A | N | D | SD |
| 53. Raising hybrid plants results in higher yields. | SA | A | N | D | SD |
| 54. Farmers are concerned about the humane treatment of animals. | SA | A | N | D | SD |
| 55. Processing food products is a benefit to consumers. | SA | A | N | D | SD |
| 56. The U.S. should allow free trade with other countries for food products. | SA | A | N | D | SD |
| 57. The world food supply has increased as a result of improved technology. | SA | A | N | D | SD |
| 58. The U.S. needs a steady supply of food and fiber products to remain strong. | SA | A | N | D | SD |
| 59. Only organic methods should be used to produce food. | SA | A | N | D | SD |
| 60. Farmers should NOT use chemicals in crop production. | SA | A | N | D | SD |
| 61. Animals have the same rights as people. | SA | A | N | D | SD |
| 62. Processing adds more to the cost of food than the raw product. | SA | A | N | D | SD |
| 63. Farmers have no control over food prices. | SA | A | N | D | SD |
| 64. Developing countries lack the ability to produce enough food. | SA | A | N | D | SD |
| 65. The government should exert more control over farming. | SA | A | N | D | SD |

| | | | | | |
|---|----|---|---|---|----|
| 66. Agriculture is the greatest polluter of our water supplies. | SA | A | N | D | SD |
| 67. Agriculture has become too mechanized. | SA | A | N | D | SD |
| 68. Animals should NOT be used for food. | SA | A | N | D | SD |
| 69. Farm grains are becoming an important energy source in the U.S. | SA | A | N | D | SD |
| 70. Developing countries need help in distributing food among needy people. | SA | A | N | D | SD |

Instructions: Please read each question completely and place a check mark in front of the appropriate response or provide an answer where indicated.

71. What is your gender?

- a. Male
- b. Female

72. What is your age?

- a. < 18 years
- b. 18-21 years
- c. 22-25 years
- d. > 26 years

73. How do you define your ethnic group:
 a. American Indian or Alaskan Native
 b. Asian or Pacific Islander
 c. Black
 d. Hispanic
 e. White
 f. Other (please specify) _____
74. What is your home state/country?

75. Are you a traditional college student (directly entering college after graduating from high school)?
 a. Yes
 b. No
76. What is your rank?
 a. First Semester Freshman
 b. Freshman
 c. Sophomore
 d. Junior
 e. Senior
 f. Graduate Student
 g. Other (please specify) _____
77. What is your major?

78. Where did you grow up?
 a. On a farm or ranch
 b. In a city
 c. In a suburb
 d. In a rural area, not on a farm
79. Have you ever worked on a farm or ranch?
 a. Yes (please specify type) _____
 b. No
80. Have you ever worked in an agricultural business?
 a. Yes (please specify type) _____
 b. No

81. Do you have relatives who live or work on a farm or ranch?
 a. Yes
 b. No
82. Do you have relatives who work in an agricultural business?
 a. Yes
 b. No
83. Did you take agricultural courses in high school?
 a. Yes (**Skip to question 85**)
 b. No (**Proceed to question 84**)
84. Did your high school offer courses in agricultural education?
 a. Yes
 b. No
85. Were you a member of FFA?
 a. Yes
 b. No
86. Were you a member of 4-H?
 a. Yes
 b. No
87. Were you a member of any other agricultural organization(s)?
 a. Yes (please specify) _____
 b. No
88. What types of agriculture-related organizations are available to you in your home community? (Check all that apply.)
 a. 4-H
 b. Ag Cooperative
 c. Breed Associations
 d. Farm Bureau
 e. FFA
 f. Grange
 g. National Beef Council
 h. National Rifle Association
 i. None
 j. Other (please specify): _____
 k. Don't Know

89. Since entering college at West Virginia University, have you become involved in any agricultural organization(s)?
_____ a. Yes (please specify) _____
_____ b. No
90. A Land Grant University is characterized by an institution whose mission is to provide instruction primarily in:
_____ a. research and development of sustainable and environmentally-friendly bio-based energy alternatives.
_____ b. agriculture, military tactics, the mechanic arts, and cooperative extension as well as classical studies.
_____ c. urban affairs and public policy.
_____ d. scientific research, education, training, and extension projects geared toward the conservation and practical use of U.S. coasts, the Great Lakes and other marine areas.
91. Are you aware that West Virginia University is a Land Grant University?
_____ a. Yes (please specify how): _____
_____ b. No
92. Are you aware that West Virginia University owns and operates several farms?
_____ a. Yes (please specify how): _____
_____ b. No
93. Are you aware that West Virginia University is not the only Land Grant University in West Virginia?
_____ a. Yes [please name other(s)]: _____
_____ b. No

Comments:

Thank you for taking the time to complete this questionnaire!

If you have any questions regarding the questionnaire, please contact me at:
lpfeifer@mix.wvu.edu.

APPENDIX C

Cover Letter to Questionnaire

October 29, 2007

Dear West Virginia University Student:

Agriculture is America's number one industry and is truly an essential element to your survival. Because the average citizen is further removed from the agricultural lifestyle than ever before, we often take for granted the impact that agriculture has on us. However, when it comes down to it, from the clothes you wear and the food you eat to your home and vehicle, the number of areas where agriculture reaches is virtually limitless. Because agriculture plays such an important role in everyone's day-to-day lives, it is essential that the average citizen have an understanding of the agricultural industry and appreciate the effects various agricultural practices and policies have on their daily lives.

The purpose of this research study is to determine the level of knowledge of agriculture possessed by incoming freshmen at West Virginia University. The results of this study will be used to prepare a thesis to partially fulfill the requirements for a Master of Science Degree in Agricultural and Extension Education. An awareness of how knowledgeable students are about agriculture will enhance the instruction of agriculture-related topics at the elementary, middle, and high school levels.

Your participation in this research study is completely voluntary and all information you provide will be held as confidential as possible. Your completion of the questionnaire is critical to the success of the study and should only take approximately ten minutes to complete. If you completed this questionnaire in another class, you do not need to fill it out again. Please feel free to skip any questions you do not feel comfortable answering. The results from the questionnaire will be reported in a summary format and individual responses will not be identifiable.

We are considering a follow-up to our initial research efforts. Should you desire to participate in this follow-up study, please provide your name and contact information on the removable insert found at the back of the questionnaire. Please remove the insert and return it separately to maintain the confidentiality of your responses. Please place the questionnaire in the box provided and the insert in the envelope provided.

Thank you in advance for your assistance with this research effort. We sincerely appreciate your time and effort.

Sincerely,

Laura L. Pfeifer
Graduate Student

Harry N. Boone, Jr., Ph.D
Associate Professor

APPENDIX D

Follow-Up Study Page

We are considering a follow-up to our initial research efforts. Should you desire to participate in this follow-up study, please provide your name and contact information in the space provided below. **Please remove this insert and return it separately to maintain the confidentiality of your responses.**

Name: _____

Permanent Address:

Primary Email Address: _____

Primary Phone Number: _____

Comments:

APPENDIX E

“Other” Ethnicities of Respondents

Other Ethnicities

Cape Verdian

Chilean

European

Middle Eastern, small amounts of Native Americans

Spanish, white?

Uzbek/Turkish

APPENDIX F

College Majors of Respondents

| | | |
|---|---------------------------------|-------------------------------|
| A&VS | Animal and Nutritional Sciences | Biochemistry |
| A&VS | Animal and Nutritional Sciences | Biochemistry |
| Accounting | Animal and Nutritional Sciences | Biochemistry |
| Accounting | Animal and Nutritional Sciences | Biochemistry |
| ACE | Animal and Nutritional Sciences | Biochemistry |
| Advertising | Animal and Nutritional Sciences | Biochemistry |
| Advertising | Animal and Nutritional Sciences | Biochemistry |
| Ag Business | Animal and Nutritional Sciences | Biochemistry |
| Ag. Business Management | Animal and Nutritional Sciences | Biochemistry |
| Ag-Business | Animal and Nutritional Sciences | Biochemistry |
| Agricultural and Extension Education | Animal and vet sciences | Biochemistry |
| Agricultural and Extension Education | Animal and vet sciences | Biochemistry |
| Agricultural and Extension Education | Animal and Veterinary Science | Biochemistry |
| Agricultural and Extension Education | Animal and Veterinary Science | Biochemistry |
| Agricultural and Extension Education and Horticulture | Animal Sci. | Biochemistry |
| Agricultural Education | Animal Science | Biochemistry |
| Agricultural Education | Animal Science | Biochemistry-Biology |
| Agricultural Education | Animal Science | Biochemistry |
| Agricultural Education | Animal Sciences | Biochemistry and Int. Studies |
| Agricultural Education | Animal Vet. Sciences | Biology |
| Agricultural Education | Archeology | Biology |
| Agricultural Education/International Studies Minor | Art | Biology |
| Agricultural Extension and Education | Art Ed/Screenprinting | Biology |
| Agriculture Education | Athletic Training | Biology |
| Agriculture Education | Athletic Training | Biology |
| Animal & Nutritional Science | Athletic Training | Biology |
| Animal & Nutritional Science | AVS | Biology |
| Animal & Nutritional Science | Bachelor of Fine Arts | Biology |
| Animal & Nutritional Science | BFA Acting Performances | Biology |
| Animal & Nutritional Science | Biochemistry | Biology and Mathematics |
| Animal & Nutritional Science | Biochemistry | Biology/Chemistry |
| Animal & Nutritional Science | Biochemistry | BM w/ IR |
| Animal & Nutritional Science | Biochemistry | Broadcast Journalism |
| Animal & Vet Science | Biochemistry | Business |
| Animal & Vet Science | Biochemistry | Business |
| Animal & Vet Sciences | Biochemistry | Business |
| Animal & Vet Sciences | Biochemistry | Business |

| | | |
|------------------------|-----------------------|-----------------------|
| Business | Criminology | Forensic and |
| Business | Criminology | Investigative Science |
| Business | Criminology and | Forensic Science |
| Business | Investigations | Forensic science |
| Business | Criminology and | Forensic science |
| Business | nvestigative Science | Forensic science |
| Business | Criminology and | Forensic science |
| Business | nvestigative Science | Forensic science |
| Business | Criminology and | Forensics |
| Business | nvestigative Science | Forensics |
| Business | Dietetics | Forensics |
| Business | Economics | Forensics |
| Business | Economics | Forensics |
| Business | Education | Forensics |
| Business - Marketing | Education | Forensics |
| Business and Economics | Education | Forensics |
| Business and Economics | Education | G.S. |
| Business and Economics | Elementary Ed. | Gen. Engineering |
| Business and Economics | Elementary Ed. | General |
| Business and Finance | Elementary Ed. | General Studies |
| Business Management | Elementary Ed. | General Studies |
| Business Management | Elementary Ed. | General Studies |
| Business Management | Elementary Ed. | General Studies |
| Business Management | Elementary Ed. | General Studies |
| Business Management | Elementary Edu. | General Studies |
| Business/Economics | Engineering | General Studies |
| Business/MIS. | Engineering | Geography |
| Chemistry | English | Geology |
| Chemistry | English | Geology |
| Child | English | Graphic Design |
| Development/Family | English | Graphic Design |
| Studies | Exercise Physiology | Graphic Design |
| Child | Exercise Physiology | History |
| Development/Family | Exercise Physiology | History |
| Studies | Exercise Physiology | History |
| Communications | Exercise Physiology | History |
| Communications | Exercise Physiology | history |
| Computer Science | Exercise Physiology | HN&F |
| Criminal Justice | Exercise Physiology | HNF |
| Criminology | Exercise Physiology | human nutrition |
| Criminology | Exercise | Human Nutrition and |
| Criminology | Physiology/Nutrition | Foods |
| Criminology | Fashion Merchandising | Human Nutrition and |
| Criminology | Finance | Foods |
| Criminology | Fincance | Human Nutrition and |
| Criminology | Foreign Languages | Foods |

| | | |
|---------------------------|-----------------------|---|
| Human Nutrition and Foods | Music Education | Pre-Business and Economics |
| Human Nutrition and Foods | Non Declared | Pre-Business Management |
| Human Nutrition and Foods | Nursing | Pre-Business Management |
| Human Nutrition and Foods | Nursing | Pre-Communications |
| Human Nutrition and Foods | Nursing | Pre-Education |
| Interior Design | Nursing | Pre-education switching to social work |
| International Studies | Nursing | Pre-Elementary |
| International Studies | Nutrition | Pre-English |
| International Studies | Occupational Therapy | Pre-finance |
| Journalism | Physical Education | Pre-Forensic Science |
| Journalism | Physical Education | Pre-Forensics |
| Journalism | Physical Education | Pre-Forensics |
| Landscape Architecture | Political Science | Pre-Forensics |
| Landscape Architecture | Political Science | Pre-Journalism |
| Landscape Architecture | Political Science | Pre-Marketing |
| Landscape Architecture | Political Science | Pre-Nursing |
| Landscape Architecture | Political Science | Pre-Pharmacy |
| Landscape Architecture | Political Science | Pre-Pharmacy |
| Landscape Architecture | Political Science | Pre-Pharmacy |
| Landscape Architecture | Political Science | Pre-Pharmacy |
| Landscape Architecture | Political Science | Pre-Pharmacy |
| Landscape Architecture | Pre athletic training | Pre-Pharmacy |
| Landscape Architecture | Pre Busa. | Pre-Pharmacy |
| Management | Pre communications | Pre-Pharmacy |
| Management Info Systems | Pre Nursing | Pre-Pharmacy |
| Marketing | Pre OT | Pre-Pharmacy |
| Marketing | Pre-Accounting | Pre-secondary educ/interdepartmental studies |
| Marketing | Pre-athletic training | Pre-secondary education/Foreign Language (French & Spanish) |
| Marketing | Pre-athletic training | Pre-Social Work |
| Marketing | Pre-athletic training | Pre-Sociology & Anthropology |
| Marketing | Pre-Bio | Pre-Speech Pathology and Audiology |
| Marketing | Pre-Biochemistry | Pre-Sport Management and Business |
| Marketing | Pre-Biochemistry | Pre-Vet |
| MIS | Pre-Biochemistry | Pre-Vet |
| MIS | Pre-Biology | Pre-vet (animal science) |
| Music Ed | Pre-Biology | Psych |
| Music Ed | Pre-Biology | |
| Music Ed | Pre-Biology | |
| Music Ed | Pre-Biology | |
| Music Ed | Pre-Biology | |
| Music Ed | Pre-Biology | |
| Music Ed | Pre-Biology | |
| Music Ed | Pre-Biology | |
| Music Education | Pre-Business | |
| Music Education | Pre-Business | |
| Music Education | Pre-Business | |

| | | |
|----------------------|----------------------|------------------------|
| Psychology | Secondary Education- | Sports Management |
| Psychology | English | Sports Management |
| Psychology | Social Work | Textile, Apparel, and |
| Psychology | Sociology | Merchandising |
| Psychology and | Sociology and | Textile, Apparel, and |
| Exercise Physiology | Anthropology | Merchandising |
| Public Relations | Speech Pathology and | Theater |
| Public Relations | Audiology | Theater Tech, Design |
| Public Relations | Speech Pathology and | Theater/Dance |
| Public Relations | Audiology | Undecided |
| Secondary Education | Speech Pathology and | Undecided |
| Secondary Education | Audiology | Undecided |
| Secondary Education | Sport and Exercise | Undecided |
| Secondary Education | Psych | Undecided |
| Social Studies | Sport Management | Undecided |
| Secondary | Sports Management | Undecided |
| Education/English | Sports Management | Underwater Basket |
| Secondary | Sports Management | Weaving |
| Education/Math | Sports Management | Voice Performance |
| Secondary Education- | Sports Management | Wildlife and Fisheries |
| English | Sports Management | |

APPENDIX G

Agriculture-Related Work Experience of Respondents

| | | |
|---|--|--|
| Angus farm | farm | livestock and |
| Angus farm | Farm | agricultural |
| Apple and feed corn and hay | Farm | Livestock Farm |
| Beef | Farm | local/small |
| Beef and dairy, horse | farm | milked my grandparents cows |
| Beef Cattle | farm | Mountain Farms |
| Beef cattle operation | farm | (Angus) Pendalton, WV |
| Beef operation, dairy farm, hog operation, horses, chickens, ets. | Farm in North Carolina (food and livestock) farm, produce, animal products | My farm |
| Beef, Sheep | farm/garden nursery | My grandparents keep horses, chickens, and pigs |
| big farm | Grain + Dairy farm | my grandparents own a dairy farm |
| Cattle | Grain wheat, christmas tree farm | Near my house for community service |
| Cattle | Greenhouse and farm (corn) | Next to b: (I did help a friend with hay several times though) |
| Cattle and tobacco | Hay and corn | Nursery, Greenhouse, Vegetable Farm |
| Cattle Farm | Hayfield | Packing beef |
| Cattle farm | Helped roll hay | personal horse farm |
| cattle, some crop production | Herding Cattle | Pig Farm |
| Christmas tree and horse | home | Plants/crops |
| Corn, beans | horse | Produce farm |
| cotton, sobean, sweet potatoes, that sort of farm | Horse | Produce farm |
| Cow Farm | horse | Produce growing |
| Cows, home garden, horses | horse and livestock | Pumpkin farm and family farm |
| Cows, horses, chickens, pigs | horse farm | Q79A |
| Dad's bef cow farm | Horse Farm | raised beef cows |
| Dairy | Horse farm | recreationally |
| Dairy | Horse farm and cabage | Sheep and cattle (show animals) |
| Dairy | Horse Rance | show cattle, club lamb operation |
| Dairy farm | Horse ranch | Small Beef Farm |
| Dairy farm | horses | small farm |
| Dairy farm | Horses | small truck farm |
| Dairy farm | horses | Stressful ones |
| Dairy WVU family | I grew up on one, chores, feeding, bailing hay | Tree Farm |
| Family Farm | I've help a friend feed the animals and do other stuff | Vineyard Beef |
| Family Farm | Kidwell farm, volunteer | Burger King |
| Family Farm | Large farm - cattle, pigs, chickens | Cedar Lakes - Landscape Mang. |
| Family Farm | | Christmas tree, pumpkin |

Club lamb operation
Dairy
Delaware Dept. of Ag
Family Farm
Family Farm
family owned club lamb
flock
farm
Farm
Feed and Seed store
Feed Angus cows
for my grandfather
Fruit market
Garden nursery
garden/landscaping
company
grain
Greenhouse
Greenhouse
Greenhouse
Greenhouse and farm
(corn)
Hay and cabage
Landscaping
Market Place
My dad owns a meat
packing plant. They
don't slaughter or
butcher. They're more
like a middleman.
Nursery
on farm
Packing Plant, Dodge
City Kansas
Plant Nursery
Proudfoot Farm
Q80A
Raised Cattle
Restraunt
Selling produce, trees,
pumpkins
Smaall Animal Practices
Tree farm
Tree Farm
Veterinary
Vineyard

WVDA
Young and Stout

APPENDIX H

Agriculture-Related Organizations Available to Respondents in their Home Communities

Ag Marketing
Boy Scouts
Fair Board, Extension Service
Probably all I'm from Lancaster

APPENDIX I

Respondent's Membership in Agriculture-Related Organizations

American Maine-Anjou Association
PA state Livestock Judging Team
PA Club Livestock Association,
Jr. Beef Producers
Appaloosa Horse Club
Youth Fair Board
Block & Bridle
Block & Bridle
Collegiate Farm Bureau, & Dairy Science Club
Farm Bureau, NRA, Fairboard
Farm Bureau, Young Farmers, Ag-Expo
FFA, 4-H
Frederick Co. Young Farmers
Junior Livestock Association
National Rifle Association
PA farm bureau, Maine-Anjou Association
Q87A
Sigma Alpha
Young Farmers, Breed Associations
Young Farmers, Farm Bureau, Mardel Watermelon Association

APPENDIX J

Respondent's Membership in Agriculture-Related Organizations at West Virginia
University

Block and Bridle
 Block and Bridle and Sigma Alpha
 Block and Bridle and Sigma Alpha
 Block and Bridle Club
 Block and Bridle, FFA, Farm Bureau
 Collegiate 4-H
 Collegiate 4-H
 Collegiate FFA
 Collegiate FFA
 Collegiate FFA
 Dairy Science, Block and Bridle
 Farm Bureau, Dairy science club
 Farm Bureau, Dairy Club, SA
 FFA, Block and Bridle
 FFA, Block and Bridle
 FFA, Block and Bridle, 4-H
 FFA, Sigma Alpha, and 4-H
 I have joined more
 If AGBI class counts than yes, if not, no.
 Sigma Alpha Sorority
 SSLA
 Wildlife & Fisheries & Sigma Alpha

APPENDIX K

Knowledge of West Virginia University's Status as a Land Grant University

| | |
|--|--|
| 8th grade WV history | Learned in AVS 105 |
| A book | learned it |
| A guy told me years ago | Lincoln |
| A teacher | Mom |
| A&VS | money is given to towards research |
| Ag Extension Class | My parents went there |
| Ag teacher told me | Orientation |
| AVS 105 class | Orientation |
| AVS 105 papers | Orientation |
| Class | parents |
| Class | Political science class |
| Class | prof told me |
| Class | Professor once told the class |
| Class | Professor told me so |
| Class | professors |
| class | question 90 |
| class | RA told me |
| Classes, Scholarships | read it in encyclopedia |
| Common knowledge | says so in my university 101 textbook |
| Common knowledge | School, WV Studies |
| Common knowledge | Social Studies |
| Convocation | Stacy Gartin |
| Ecampus link | Teacher |
| Extension Program in class | this class |
| Family | this class |
| Family has talked about it | through class |
| From A&VS 105 | through my AVS class |
| from high school class | Through this class |
| Gov gave WV money to start a university | Told at orientation |
| Guest speaker in class | univ 101 |
| heard it said several times | Univ. 101 It was given as an agricultural school |
| Hillar Klandorf told us | University 101 |
| History class | University 101 |
| History class | University 101 |
| Honors 199 | university 101 |
| I found out in class. | University 101 |
| I heard about it | University 101 |
| I heard during orientation | University 101 |
| I learned this in 4-H | University 101 |
| I live by the school | University 101 |
| I went to president inuagaration | University 101 |
| It was established as WV agriculture college | University 101 |
| It's in he brocure | University 101 |
| Jepardy | University 101 class |

Via wikipedia/university 101 handbook
Was told when I came here
We had a speaker come to this class
Word of Mouth
WV studies in middle school

APPENDIX L

Knowledge of West Virginia University's Status of Owning and Operating Several Farms

A&VS
A&VS 251
Ag Bio 199
Ag Bio trip to one of WVU's farms
Been there
been to a couple
Been to a WVU farm.
Been to some of them
Biochem 199
Bonnie Fischer told me
Campus map/familiar with area
Class
Class
Class
Class
class
Classes, general
Common knowledge
Common knowledge
Common knowledge
Cousin worked on one
Dairy
Dairy club
Desire to work in them.
Drive by them
drove by them
Drove past some of them
Drove past them
Field Trip in Orientation Biochem
fieldtrip
flyers
forget how, just did
friend
Friend works @ one for her major
friends
Friends
Golden Horseshoe studying
grew up in WV. Just knew
Have a friend who is involved
Have a lab at animal and vet science
farm
have seen them
heading to 68, apples for sale
I am from Morgantown, I just know
I am from Morgantown, I see them
I am now

I do not know how
I drive by them
I drive past one of them every day
I have a lab at the farm A&VS 251
I have been there during SAE contests
I have been to the farm
I have driven by the WVU farm
I have had the pleasure of working on
them
I have seen the farms
I have seen them
I heard about it.
I live by them
I live in Morgantown
I live near one
I lived by one
I pass by it everyday
I saw them
I saw them driving around
I see the signs
I visited one in this class
I was at a farm on this campus
I work on one
I'm from Morgantown
It's for the animal/vet science program
along with any other farming/animal
care program
I've been there
I've been there
I've been to one
I've been to one with a friend
I've been to them
I've driven by them.
I've seen one. I didn't know about the
others.
I've seen them
I've seen them
just a guess
just heard from a teacher
just knew
Just know/everybody does
labs
Live near one
Looking outside
My english class
My friend Blain Rice works there

My friend is majoring in vet science
my friends got lost finding towers
my professors
My roommate
NA
one is in Reedsville, the county where I
live
orientation info
Out in Suncrest
Passed them by when driving
professor once told the class
Professor told us
Professors
relatives in Ag classes here
Saw on a map
saw them on the road
Seeing them around town
Seen them
Seen them
Signs
The animal farm and organic farm
There are many farms here.
This class
through this class
told at orientation
Trips to the farm
University 101
University 101
Visit them in Biochemistry class
Visited recently
Visited the farms
WVU Farm?

APPENDIX M

Knowledge of Other Land Grant University in West Virginia

can't remember
Don't know specifically
Don't remember
Fairmont, West Virginia State
I just assumed there were others.
Idk
No recollection of which ones
Potomac state, Biotech
Potomac State?
PSC
PSU, MD
There is one more in or near Charleston
West Virginia College in Charleston
West Virginia State
West Virginia State
West Virginia State
West Virginia State
West Virginia State University
West Virginia State University
West Virginia State University

APPENDIX N

Comments

DON'T EAT MEAT!

I learned a lot.

I love plants!

Question 34 is highly ambiguous and no solid data supports claims one way or the other as current (and any foreseeable future) methods of production have negative EROI (energy returned on energy invested), meaning it is a net loss of energy and far less viable than other biofuels (ie biodiesel).

This here's farm country.

This survey was pretty interesting, and I actually learned some things from it.

This was cool, but long

This was very unnecessary.

VITA

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- June, 2002 Graduated McGuffey High School, Claysville, Pennsylvania.
- May, 2006 Bachelor of Science in Animal and Veterinary Sciences, West Virginia University.
- May, 2008 Master of Science in Agricultural and Extension Education, West Virginia University.