

## UNIVERSITY STUDENTS' PERCEPTIONS OF ISSUES RELATED TO AGRICULTURE

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### Abstract

*Some of the most controversial issues currently being debated in society are related to agriculture. Discussions and decisions about topics concerning the environment, food safety, animal welfare, and health, all impact the processes used in the food and fiber industries. As these issues become more prominent in society, it is important for citizens to understand how these industries affect their way of life. Generally speaking, Americans have low levels of awareness and inaccurate perceptions about agriculture and its impact upon society and the environment. Contributing to this situation is a flood of misinformation about agriculture and agricultural products currently being promoted. Such ignorance and misconceptions are a concern because of the influence Americans have upon the decision-making process through our political system. This research investigated the perceptions of university students concerning issues related to agriculture. Over all, students were found to have favorable perceptions about the safety of food and the impact of agriculture upon the economy and environment. Males tended to be more positive about animal welfare and methods used in production agriculture. Gender, college major, and hometown were also related to perceptions about other issues related to agriculture.*

Much attention has been given to the fact that the American society is "agriculturally ignorant." Coon and Cantrell (1985) pointed out that, "Today, the public's image of agriculture is a kaleidoscope of leftover attitudes and images of what agriculture was in the '40's, '50's and early '60's" (p.22). While newly developed agricultural literacy programs have been designed to improve such images, there are other factors that might cause agriculture to have a less than appealing image.

Urbanization of the population of the United States has contributed to inaccurate perceptions and low awareness about agriculture. Sorenson (1987) stated that as our population continues to shift to cities, fewer Americans are likely to have contact with production agriculture. Because most people in this country do not have to be concerned about the supply of high quality food and fiber, many fail to understand its benefits to our society (USDA, 1983).

Some of the most controversial topics currently being considered in our society involve agriculture. Today, special interest groups have been organized concerning issues such as food safety, animal welfare, and the environment. These groups are often well funded, have celebrity spokespersons, and receive a great deal of attention from the media. The efforts of these groups and their members have brought about changes in agricultural practices and policies, if not in the perceptions that the general public has about the industry (Watson, 1991; Howard, 1992; Paschall, Hollingsworth, Craig, et al, 1992).

Several agricultural groups have taken the offensive to counter-act the messages of animal rights and environmental activist groups (Warner, 1991; Culliton, 1991). Agricultural literacy programs also include objectives to inform a variety of audiences about the ways in which food and fiber producers treat animals ethically and work in harmony with the environment while providing safe

and healthy products.

It is vital that the general public have accurate perceptions about agriculture for several reasons. Agriculture is important because of its impact upon our society, the economy, the environment, and personal health. University students represent the next generation of policy-makers. It is important to understand their perceptions regarding issues related to agriculture so that educational programs might be designed to meet their needs. Therefore, the problem of this study was: Considering the negative attention that has been directed towards agriculture and the social changes that have taken place in the United States, how do university students perceive controversial issues related to agriculture?

### **Purpose and Objectives**

The purpose of this study was to determine the perceptions of university students regarding controversial issues related to agriculture and how the students' demographic characteristics are associated with those perceptions.

The following objectives were formulated to accomplish the purpose.

1. Identify selected demographic characteristics of university students.
2. Determine perceptions of university students regarding controversial issues related to agriculture.
3. Identify association between demographic characteristics and university students' perceptions concerning controversial issues related to agriculture.

### **Methods and Procedures**

The population of this study was all students enrolled at Texas Tech University during the spring semester of 1992. The University has an enrollment of approximately 24,600 students in seven colleges and two professional schools (medicine and law).

The sample of 400 students was selected which exceeded the minimum sample for a population of this size suggested by Krejcie and Morgan (1970). Using procedures proposed by Dillman (1978), a random sample was drawn from the 1991-92 Texas Tech University Directory.

The instrument used to collect the data was a questionnaire designed by the researchers. Part I consisted of questions pertaining to demographic characteristics of the students. These characteristics included: College (Agricultural Sciences, Architecture, Arts and Sciences, Business Administration, Education, Engineering, Home Economics, Law, Medicine), Classification (Freshman, Sophomore, Junior Senior, Graduate), Age (20 or younger, 21-22, 23-25, 26 and older), Hometown (Farm or Ranch, Country but not a Farm or Ranch, Town of less than 5,000 residents, City of 5,000 - 50,000 residents, City of 50,000 to 1 million residents, Metropolitan of more than 1 million residents), Ethnicity (African-American, Asian-American, Hispanic-American, Native American, White American, International Student), and Gender.

Part II was composed of questions addressing controversial issues related to agriculture with five point, Likert-type scaled responses. The choices were: 1=strongly disagree, 2=disagree, 3=neutral or undecided, 4=agree, 5=strongly agree. Faculty of the College of Agricultural Sciences at Texas Tech University were solicited to provide topics and questions concerning issues in their field. At least one faculty from each department contributed to the study.

Validity of the instrument was assessed by a panel of experts composed of faculty from the

College of Agricultural Sciences and a pilot test was conducted. Following the data collection, a Cronbach's alpha of .87 was calculated on the items in Part II.

Data were collected via telephone using procedures suggested by Dillman (1978). Ten agricultural communications students were hired to administer the questionnaire with each caller assigned to obtain 40 responses. To check inter-rater reliability, correlation coefficients were calculated between the variable "caller" and all other variables. The caller variable was found to have no more than a .19 correlation with any of the other variables and most correlations were found to be negligible.

Statistical analysis was completed using SPSS for the Macintosh. Means, standard deviations and correlation coefficients were computed for each item.

Factor analysis was performed on the responses to the items in Part II of the questionnaire. According to Kim and Mueller (1978), a screen test can be used to determine the number of factors to be extracted. In this case, five factors were extracted. Items were grouped into the five factors based upon their factor loading using an orthogonal rotation. Items with a loading of less than .50 were eliminated.

Upon examination of the factor loadings, each of the five factors were named. The factors were named as follows: Food Safety, Animal Welfare, Farming Practices, Animal Medications, and Impact of Agriculture. To obtain a factor score for further analysis, an average was computed for each factor. Table 1 contains the items in each factor and the loading for each.

Correlation coefficients, one-way analysis of variance (ANOVA) and stepwise multiple regression were employed to analyze the

relationships between and among variables. The Modified LSD post hoc test was used to identify differing variables detected by the ANOVA procedures. An alpha level of  $p < .05$  was used on all tests.

## Results

A total of 390 usable responses were obtained for a response rate of 97.5%. The demographic characteristics of the respondents indicated that the sample was representative of the population. Each classification, ethnic group and gender were appropriately represented. Likewise, there was appropriate distribution of the students by college as illustrated in Figure 1.

Over all, university students agree that their food is safe to eat. The Food Safety factor had a mean of 4.14 on the five point Likert-type scale. They also agreed with the items in the Impact of Agriculture factor (4.42) indicating they were positive about the role of agriculture on our economy and the environment.

The student body was neutral or undecided concerning the Animal Welfare, Farming/Ranching Practices, and Animal Medication factors. The means for Animal welfare (3.14) and Animal medication (3.31) were above the midpoint of the scale and the mean for Farming/Ranching Practices (2.85) was below the midpoint of the scale. Table 1 reports the means and standard deviations for each factor.

The analysis of each factor by college in which respondents were enrolled indicated that students enrolled in the College of Agricultural Sciences were significantly different than students from one or more of the other colleges on each factor (Table 2). Agriculture students had more favorable perceptions of food safety, animal welfare, farming/ranching practices, and animal medications, than did students in the College of

Table 1. Means, Standard Deviations and Factor Loading for Each Factor

Factor/Item	Mean	S.D.	Factor Loading
<b>Food Safety</b>	<b>4.14</b>	<b>0.52</b>	
Vegetables like celery, carrots & potatoes are safe to eat.	4.23	0.54	.84
Fruits like apples, peaches, & oranges are safe to eat.	4.22	0.56	.81
Milk and dairy products are safe to eat.	4.16	0.59	.77
Fish, chicken and turkey are safe to eat.	4.11	0.68	.76
Red meats like beef, lamb and pork are safe to eat.	3.97	0.76	.66
<b>Animal Welfare</b>	<b>3.14</b>	<b>0.79</b>	
It is okay to use animals for research to discover or test medications to help humans.	3.79	1.04	.75
Animals used for the production of food are treated in a humane way.	3.38	0.98	.61
Research animals are treated in a humane way.	2.98	1.10	.72
It is okay to use animals to test make-up soaps, and cleaners.	2.83	1.21	.51
It is okay to produce animals primarily for their hide or fur to be used for products like fur coats.	2.73	1.15	.67
<b>Farming/Ranching Practices</b>	<b>2.85</b>	<b>0.65</b>	
Methods used to raise livestock and grow crops do not have detrimental effects on land, air and water.	3.24	0.94	.55
I would pay more for food that has not been treated with any chemicals or hormones.	2.83	0.56	.68
I try to buy foods labeled "organic" or "natural."	2.87	0.99	.59
<b>Farming/Ranching Practices (continued)</b>			
Farmers and ranchers use an appropriate amount of chemicals to grow their products.	2.96	0.87	.63
Agricultural production practices need not be changed to care for the environment.	2.45	1.01	.63
<b>Animals Medications</b>	<b>3.31</b>	<b>0.73</b>	
It is okay to give animals medication to help them grow fast and stay healthy.	3.68	0.86	.58
It is okay to give hormones to animals produced for their meat to help them grow fast and stay healthy.	3.19	0.99	.69
The use of artificially introduced hormones should not be banned.	3.08	1.00	.63
<b>Impact of Agriculture</b>	<b>4.42</b>	<b>0.52</b>	
Agriculture is an important contributor to our economy	4.52	0.61	.68
Farmers and ranchers care about the environment.	4.32	0.67	.70

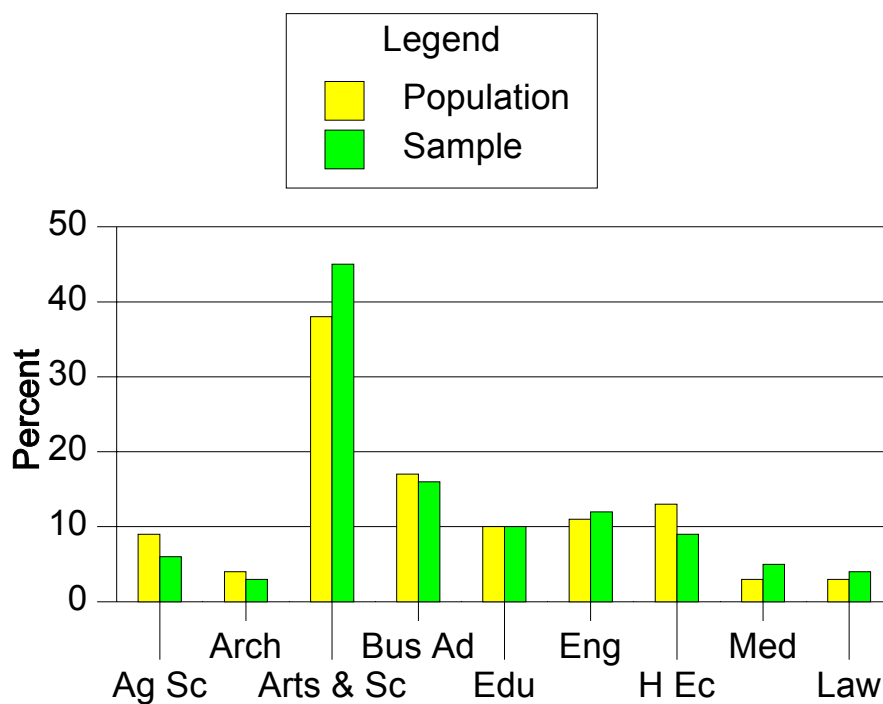


Figure 1. Comparison of Distribution of Sample and Population by College

Arts and Sciences. Agriculture students differed from engineering students on the food safety factor, from architecture students on animal welfare, from home economics students on farming/ranching practices, from medical students on animal medicine, and from business administration students on the impact of agriculture. No significant differences were found on any factors between agriculture students and students in the College of Education or the School of Law.

The analysis of variance by classification showed significant differences between juniors and seniors on food safety. There was a significant difference between students less than 20 years of age and those ages 20 to 22 on the animal welfare factor with the younger students having more favorable perceptions. There were no other differences in perceptions about any of the factors between the other age classifications or ethnic groups.

When the factors were compared by hometown, students who were from a farm or ranch had significantly more favorable perceptions food safety and animal welfare than did students from communities of less than 5,000 to more than 1 million. They were also more favorable about farming and ranching practices than students from cities of 5,000 or more, and more favorable about the impact of agriculture than students from cities of 50,000 or more (Table 3).

Males and females differed on each of the five factors. Males had more favorable perceptions about each factor except farming practices. Table 4 shows the results of the post hoc test.

Stepwise multiple regression revealed that one or more of the students' demographic characteristics explained a statistically significant portion of the variance associated with each of the five factors. Hometown explained the greatest amount of

Table 2. Factors Where Significant Differences Were Found by College

College	1	2	3	4	5	6	7	8	9
Agricultural Sciences (1)		b	a,b,c,d	e		a		c	d
Architecture (2)									
Arts and Sciences (3)									
Business Adm. (4)									
Education (5)									
Engineering (6)									
Home Economics (7)									
Medicine (8)									
Law (9)									

\*p<.05; Modified LSD post hoc test used; <sup>a</sup>=food safety, <sup>b</sup>=animal welfare, <sup>c</sup>=farming/ranching practices, <sup>d</sup>=animal medication, <sup>e</sup>=impact of agriculture.

Table 3. Factors Where Significant Differences Were Found by Hometown

Hometown	1	2	3	4	5	6
Farm or Ranch (1)			a,b	a,b,c	a,b,c,e	a,b,c,e
Country, but not a farm or Ranch (2)						
Town of less than 5,000 (3)						
City of 5,000 to 50,000 (4)						
City of 50,000 to 1 million (5)						
Metropolitan of more than 1 million (6)						

\*p<.05; Modified LSD post hoc test used; <sup>a</sup>=food safety, <sup>b</sup>=animal welfare, <sup>c</sup>=farming/ranching practices, <sup>d</sup>=animal medication, <sup>e</sup>=impact of agriculture.

Table 4. Analysis of Variance of Factors by Gender

Factor	Mean score by gender		F	p
	Female	Males		
Food safety	4.08	4.19	4.95	.0266*
Animal welfare	2.99	3.28	12.87	.0004*
Farming/ranching practices	2.76	2.93	6.093	.0140*
Animal medication	3.11	3.50	29.65	.0000*
Impact of agriculture	4.50	4.35	7.56	.0063*

\*p<.05

variance for every factor except Animal Medication. For each of these four factors, gender explained the second greatest portion of the variance.

Hometown and gender explained 6.84% of the variance associated with the Food Safety factor,

8.37% associated with the Animal Welfare factor, 6.60% of the variance associated with the Farming/Ranching Practices factor, and 4.60% of the variance associated with the Impact of Agriculture factor.

For the Animal Medication factor, gender

(7.10%), college (1.63%), and hometown (1.24%) explained nearly 10% of the variance (see Table 5).

### Conclusions

1. Overall, university students perceive the food supply to be safe to eat and that agriculture has a positive impact on our economy and environment.
2. University students have neutral or undecided perceptions concerning animal welfare, farming and ranching practices, and the use of medications on animals.
3. Students from the School of Law and College of Education tended to have the same perceptions as did students from the College of Agricultural Sciences. Students from all other colleges tended to differ from students from the College of Agricultural Sciences on one or more factors.
4. Male university students have more positive perceptions about food safety, animal welfare, farming and ranching practices, and the use of medications on animals than do their female counterparts.
5. Of the demographic characteristics studied, hometown and gender explain the greatest amount of variation associated with students' perceptions about food safety, animal welfare, and farming and ranching practices.

Table 5. Stepwise Regression Analysis of Students' Characteristics on Each Factor

Dependent Variable/ Independent Variable	R	R <sup>2</sup>	R <sup>2</sup> Change	df	F
<b>Food safety</b>					
Hometown <sup>a</sup>	.2407	.0579	.0579	(1,388)	23.86*
Gender <sup>b</sup>	.2616	.0684	.0105	(2,387)	14.21*
<b>Animal Welfare</b>					
Hometown <sup>a</sup>	.2344	.0550	.0550	(1,388)	22.57*
Gender <sup>b</sup>	.2893	.0837	.0287	(2,387)	17.63*
<b>Farming/Ranch Practices</b>					
Hometown <sup>a</sup>	.2298	.0528	.0528	(1,388)	21.26*
Gender <sup>b</sup>	.2569	.0660	.0132	(2,387)	13.67*
<b>Animal Medication</b>					
Gender <sup>b</sup>	.2665	.0710	.0710	(1,388)	29.65*
College <sup>c</sup>	.2954	.0873	.0163	(2,387)	18.50*
Hometown <sup>a</sup>	.3158	.0997	.0124	(3,386)	14.25*
<b>Impact of Agriculture</b>					
Hometown <sup>a</sup>	.1580	.0250	.0250	(1,388)	9.93*
Gender <sup>b</sup>	.2144	.0460	.0210	(2,387)	9.92*

\*p<.05; <sup>a</sup> Hometown coded: 1 = farm or ranch, 2 = country, not a farm or ranch, 3 = town <5,000, 4 = small city 5,000 - 50,000 to 1 million, 6 = metropolitan more than 1 million; <sup>b</sup> gender coded: 1 = female, 2 = male; <sup>c</sup> College coded: 1 = Agricultural Sciences, 2 = Architecture, 3 = Arts & Sciences, 4 = Business Administration, 5 = Education, 6 = Engineering, 7 = Home Economics., 8 = Medicine, 9 = Law.

- 6 Of the demographic characteristics studied, gender, college, and hometown explain the greatest amount of variation associated with students' perceptions about the use of medications on animals.

### Recommendations

1. Students enrolled in colleges other than the College of Agricultural Sciences, the School of Law, and College of Education should be provided with information concerning controversial issues related to agriculture, particularly in the areas of animal welfare, farming and ranching practices, the use of medications on animals, and the impact of agriculture on our economy and the environment.
2. Programs to inform university students about controversial issues related to agriculture should be designed to target students from cities and metropolitan areas and females. Such programs might be conducted through programs such as an Agriculture Week on campus and through service courses.
3. A study should be conducted to determine why students from the College of Agricultural Sciences have similar perceptions to students from the School of Law and College of Education
4. A study similar to this one should be conducted with university students from other regions of the nation and on campuses with out a college of agriculture.

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