

**University Student Perceptions Regarding Agriculture and Names of Agricultural  
Faculties and Departments of Agribusiness**

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**Submitted to the Faculty of Graduate Studies in Partial Fulfillment of the  
Requirements for the Degree of**

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**University Student Perceptions Regarding Agriculture and Names of Agricultural Faculties and  
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**by**

**Ryan James Buchanan**

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of  
Manitoba in partial fulfillment of the requirement of the degree  
of  
Master of Science**

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## Abstract

Enrollment in many faculties, colleges, schools and programs of agriculture in universities across North America has appeared to be in decline for the better part of the last two decades. Factors that may have influenced this decline may be the perception that students hold regarding agriculture and names of agriculture faculties and agricultural economics and agribusiness departments. As a result the three objectives of this thesis are to: 1) examine university students' perception of agriculture, 2) examine the perceptions that university students hold regarding the names of agriculture faculties, 3) examine the perceptions that university students hold regarding the names of agribusiness and agricultural economics departments. In order to achieve these objectives, a survey questionnaire was used and consisted of Likert scale and ranking questions. The resulting data from the survey was then used to create an ordered probit model and a factor analysis model, as well as providing descriptive statistics.

The findings of this thesis indicate that students have a positive perception of agriculture. The results also show that students prefer agriculture faculty names that make reference to agriculture, science and agribusiness. Furthermore, a factor analysis model revealed student perceptions of specific opportunities and concerns related to agriculture. These preferences are important to faculty stakeholders whose faculties have names that make reference to agriculture, as they may significantly influence student enrollment decisions. Finally, this thesis determined that students prefer an agricultural economics and agribusiness department name that makes reference to the program being applicable to the students' career.

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## Chapter 1: Introduction

This study examines factors that may influence a student's decision to enroll in a university's faculty of agriculture. These papers provide important insight considering that student enrollment in a number of university agricultural faculties has been in decline in previous years and even decades. As student numbers have declined, many university faculties of agriculture have found a need to increase student enrollment. These papers look at ways of doing this by analyzing the perceptions that university students have of the agriculture industry and university faculties of agriculture. As well, the papers examine student perceptions of alternative names for faculties of agriculture and departments of agricultural economics and agribusiness. A number of such faculties and departments have considered changing their names in order to improve their image and to help increase enrollment levels. The data used in these studies was collected through a survey questionnaire that was administered on the University of Manitoba campus, in Winnipeg, Canada. The data obtained was then used to create an ordered probit model and a factor analysis model, in addition to providing descriptive statistics.

The first paper presented in this thesis looks specifically at the overall perception that students have of the agriculture industry. This paper also examines how certain aspects of the agriculture industry affect a student's perception of agriculture. These perceptions are important as they may be a significant factor in a student's decision of whether to enroll in a faculty of agriculture. By analyzing these student preferences it will become evident which images or perceptions of agriculture that students feel negatively about and

which perceptions they feel positively about. By gaining this knowledge, university faculties of agriculture may be able to identify which perceptions they need to reinforce and focus upon in their marketing efforts.

The second and third papers in this thesis examine the names of agriculture faculties and agricultural economics and agribusiness departments, respectively. More specifically, these papers attempt to determine the names that are most appealing to university students. The name that an agricultural faculty or department uses can be very important as it is often the first contact that students have with a faculty or department. Different names can mean different things to students and it is important that faculties recognize this as certain names will appeal to students while others could push prospective students away. By using the information provided in this thesis university faculties may be able to adjust their name in such a way that they are able to appeal to students while still representing the programs their faculty or department offers.

These papers are intended to provide some insight into perceptions that students hold of agriculture and of agriculture faculties. Hopefully, faculties of agriculture will be able to use this information to gain a better understanding of their potential students and to alter their marketing efforts to improve student enrollment.

## **Chapter 2: Factors that Influence University Students' Perception of Agriculture**

### ***Introduction***

Enrollment in many faculties, colleges, schools and programs of agriculture in universities across North America has appeared to be in decline for the better part of the last two decades. This is of interest to Agribusiness and Agricultural Economics Departments as well, as they often make of a considerable share of students that are enrolled in Agriculture Faculties. In recent years this decline has appeared to slow, but the number of students studying agriculture at the post-secondary level is still well below peak levels found in the 1980's. While there are many possible reasons for this decline in enrollment, one factor that needs to be considered is the perception that the public, and more importantly potential students, have of agriculture.

The way in which a student perceives agriculture is important to the success of university agriculture faculties as it can have a significant impact on whether a student will consider entering such a faculty. A student who has a highly positive perception of agriculture may find such a faculty more attractive and, as a result, be more likely to enter a faculty of agriculture. Likewise, a student that has a poor perception of agriculture may find an agriculture faculty to be unappealing and decide to enter a different faculty.

While a positive perception of agriculture is important to recruit students, there are also many other factors that can influence a student's overall perception of agriculture.

Factors such as demographics, agriculture industry attributes and agriculture career qualities can all have an impact on a student's overall perception of agriculture. In turn, this overall perception can have an impact on whether a student considers entering a university agriculture faculty.

Student enrollment is an important issue for any university faculty as it is often given significant consideration when universities are determining the levels of funding that each faculty should receive. Since student perceptions of agriculture can have an influence on enrollment levels, it is important that university agriculture faculties understand these perceptions and address them in their marketing efforts. In order to provide insight for these faculties, this paper has two objectives. The first objective is to examine the perception that university students have of agriculture. The second objective is to examine the factors that influence university students' perceptions of agriculture, such as socio-demographics and agricultural job characteristics.

### ***Literature Review***

There has been limited research conducted in the area of university student perceptions of agriculture and how perceptions of aspects of the industry influence a student's overall perception of the industry. However, there are several studies that are somewhat relevant as they examine the perceptions held by groups other than university students.

Newsom-Stewart and Sutphin (1994) analyzed the perceptions that tenth grade students have of agriculture and environmental science based on gender and ethnicity. Results of this study indicated that tenth grade students have a positive view of the importance of

agriculture. They also found significant differences between students of different ethnic backgrounds as Caucasian students have a more positive perception of agriculture than other ethnic groups.

Frick, Birkenholz and Machtmes (1995) examined rural and urban adult knowledge and perceptions of agriculture. This study found that respondents from rural areas and who held a higher level of education are more knowledgeable about agriculture. In addition the researchers discovered that all of the groups of respondents surveyed have a positive perception of agriculture. Frick, Birkenholz and Machtmes (1995) also explored 4-H member knowledge and perception of agriculture. In this study the results indicated that students who have a 4-H background have a high level of knowledge about agriculture and have a perception of agriculture that is high.

Humphrey, Stewart and Linhardt (1994) looked at pre-service elementary education majors' knowledge of and perceptions toward agriculture. They found that respondents have a level of knowledge about agriculture that is high and that the overall mean level of perceptions toward agriculture is positive. In addition the survey revealed that respondents with higher the levels of education are more likely to have a positive perception of agriculture.

Matthews and Falvey (1999) attempted to determine year ten (grade ten) students' perceptions of agricultural careers. This study determined that students ranked income as one of the lowest ranked factors to a career in agriculture while conservation and

environmental issues are ranked the highest. Students are also unaware of the variety of careers available in agriculture, highlighted by a low percentage of students believing that “scientist” is a career that can be achieved with an agricultural degree. Finally, students in both metropolitan and non-metropolitan areas have a perception of agriculture that is positive.

While the above studies focus on non-university students, this study seeks to examine the perceptions that university students have of agriculture and the factors that influence these perceptions.

### ***Data Collection***

The data for this analysis was collected through a survey questionnaire that was administered on the University of Manitoba campus, in Winnipeg, Canada. The data was collected in University Centre, a general meeting place for students from all faculties. Students were randomly approached to conduct the survey and were voluntary participants. Additional responses were obtained from students in the Faculty of Agricultural and Food Sciences. Agriculture students were surveyed in order to ensure a comparison could be made between agriculture and non-agriculture students. No student was forced to take part in the survey, as it was completely voluntary.

In total, 232 responses were attained over a two day period. Of those 232 respondents, 22.8% were enrolled in an agricultural faculty while the remaining 77.2% were enrolled in faculties other than agriculture.

The survey questionnaire entails four sections: 1) socio-demographics 2) environmental aspects of agriculture 3) agriculture industry attributes 4) agricultural job characteristics. The questions were presented in three different forms, including five-point Likert scale, binary scale and ranking. The five-point Likert scale questions ask students to respond, on a scale of 1 to 5, as to whether they agree with the statement made in the question, with 1 representing strongly disagree and 5 representing that the student strongly agrees. The binary questions ask students to respond to a question with either a yes or a no answer. The ranking questions asked students to rank students preferences on a scale of 1 through 7, with 1 representing the most preferred and 7 the least preferred. It should be noted that not all of the questions and variables gathered in the survey were used for analysis.

## ***Methodology***

The analysis used in this study is based upon two types of analyses. The first type used is simple descriptive statistics, which determines the overall perception (positive or negative) that students have of agriculture. Students were asked to indicate whether their perception of agriculture was positive. Choices presented to the students were in Likert scale and were scaled from strongly disagree to strongly agree.

The other method of analysis used in this study was an ordered probit model. An ordered probit model allows the evaluation of the strength of the linkage between an independent variable and various explanatory variables. Previous studies using this method include Dennis (2000); West, Larue, Touil and Scott (2001); Grannis and Thilmany (2002);



Roosen, Lusk and Fox (2003). In this study various factors that determined a student's overall perception of agriculture were examined using an ordered probit model. The different variables used in the model and their meaning can be found in Table 2.1.

The probit model used in this study may be specified as according to Kim and Boyd (2004):

$$(1) U = \beta X + \epsilon, \quad \epsilon \sim N(0,1)$$

The ordered probit estimation technique was developed to analyze responses expressed as ordinal rankings. The dependent variable takes values of 1, 2... j. These values are not intervals in nature, but reflect categories of arbitrary width. This ordered probit estimator is structured around a latent variable (U) whose level is influenced by explanatory variables, expressed as a vector (X) of the students' ranking on selected perceptions and socio-demographic factors (equation (1)).

The (U) variable is not observable, but is assumed to underlie the observed vector of importance rankings, R (where R = 1, 2... j), as in equation (2) below. The relationship between U and R is assumed to a function of cutoff points ( $\mu_j$ 's) which are estimated along with the regression coefficients such that:

$$(2) R = \begin{cases} 0 & \text{if } U \leq 0; \\ 1 & \text{if } 0 < U \leq \mu_1 \\ 2 & \text{if } \mu_1 < U \leq \mu_2 \\ \vdots & \\ j & \text{if } U > \mu_{j-1} \end{cases}$$

The probability of the respondent choosing a specified ranking (i.e. perception) is given as:

$$\begin{aligned}
 \rho(R_i = 0) &= \phi(-\beta X) \\
 (3) \quad \rho(R_i = 1) &= \phi(\mu_1 - \beta X) - \phi(-\beta X) \\
 \rho(R_i = 2) &= \phi(\mu_1 - \beta X) - \phi(\mu_1 - \beta X) \\
 &\vdots \\
 \rho(R_i = j) &= 1 - \phi(\mu_{j-1} - \beta X)
 \end{aligned}$$

where  $\phi(\cdot)$  is the cumulative probability function of a normal distribution. The coefficient vector  $\beta$  and the coefficient  $\mu_1 \dots \mu_j$  are estimated using maximum likelihood estimation.

Using the above specification, the model used in this paper can be presented as follows, based on variable definitions in Table 2.1:

$$\begin{aligned}
 \text{Perception of agriculture} &= \beta_1(\text{Caucasian}) + \beta_2(\text{Aboriginal}) + \beta_3(\text{Year in University}) + \\
 &\beta_4(\text{Rural Landscapes}) + \beta_5(\text{Environmental Issues}) + \beta_6(\text{Science}) + \beta_7(\text{Business}) + \\
 &\beta_8(\text{Manual Labor}) + \beta_9(\text{Low Income}) + \beta_{10}(\text{Low Job Satisfaction}) + \beta_{11}(\text{Women in} \\
 &\text{Agriculture}) + \beta_{12}(\text{Minorities in Agriculture}) + e
 \end{aligned}$$

## **Results**

### **Section 1: Students' General Perception of Agriculture**

The first question analyzed in this study focuses on the perception that students have of agriculture. Students were asked to indicate whether or not they agreed with the statement that they have a positive perception of agriculture. Students were given five

choices to select from, strongly disagree, disagree, neutral, agree and strongly agree. Of the 232 students surveyed, 22.8% were enrolled in an agriculture faculty while 77.2% were enrolled in a faculty outside of agriculture.

The results show that students have a positive image of agriculture (Table 2.2). Nearly 65% of students agreed or strongly agreed that they have a positive perception of agriculture. Only 10% of students indicated that they disagreed or strongly disagreed with the statement. The remaining 25% of students indicated that they were neutral or indifferent to the statement. The overall average Likert score for the 232 students was 3.74, ranking between neutral and agree.

The respondents were also segmented into two groups, agriculture students and non-agriculture students in order to examine potential differences between these two groups of students. As expected, agriculture students have a more positive perception of agriculture than non-agriculture students (Table 2.2). However, non-agriculture students still have a positive perception of agriculture as nearly 57% of those students agreed or strongly agreed that they have a positive perception of agriculture. Meanwhile, 31% of non-agriculture respondents have a neutral perception while 12% disagreed or strongly disagreed that they have a positive perception of agriculture. The overall, average Likert score for non-agriculture students is 3.54 out of 5, which compares to a 4.41 average Likert score for agriculture students. This higher average for agriculture students may be a result of familiarity with agriculture, studying agriculture and living in rural areas and as a result being more exposed to agriculture than non-agriculture students.

## **Section 2: Factors that Influence Students' Perception of Agriculture**

Given that students have an overall positive perception of agriculture, it is important to consider what influences this perception. Various factors that determine students' overall perceptions of agriculture were examined. The definitions and descriptions of these variables can be found in Table 2.1. It should be noted that several variables in the survey questionnaire, such as gender and respondents area of residence, were not included in the model presented here, as they lacked the significance required to be included. Table 2.3 shows that all of the variables analyzed are significant with the exception of one (Rural Landscape). The McFadden r-square for this ordered probit model is equal to 0.16 (Table 2.3), a reasonable value for the analysis conducted.

### **Socio-Demographic Variables**

#### **Caucasians**

The variable representing Caucasian students has a positive sign with a value of 0.624 (Table 2.3), meaning a student's perception of agriculture increases if that student is Caucasian. This is supported by several other studies that have found Caucasians are more receptive to agriculture and have a more positive perception of agriculture (Newsom-Stewart and Sutpin, 1994; Talbert and Larke, 1995; Jones, Bowen and Rumberger, 1998). This outcome may be explained by looking at the demographics of the agricultural workforce. For example, a higher percentage of Canadians that have ties to agriculture are Caucasian (93%), rather than visible minorities or aboriginals (7%) (Statistics Canada, 2003, 2001 Census).

## **Aboriginals**

Aversion to agriculture by ethnic minorities is supported by the coefficient for Aboriginal students, which has a negative sign and is equal to -0.758 (Table 2.3). This suggests that a student's perception of agriculture decreases if that student is Aboriginal. Literature exploring such negative perceptions is limited as there are no studies focusing directly on Canadian Aboriginals and their perceptions of agriculture. However, there have been numerous American studies on the perceptions that minorities in that country have of agriculture. Talbert and Larke (1995) found that minority students were not attracted by more traditional aspects of agriculture or agricultural education. This is supported by Jones, Bowen and Rumberger (1998) who found that minority students (African Americans) were less positive than other students about the agricultural sciences.

Many Aboriginals in Canada are located in urban environments and have had little to no experience with agriculture. In fact, less than 20% of all aboriginals live in rural areas that are not reserves and just 2% of aboriginals work in agriculture or related industries (Statistics Canada, 2003). As a result aboriginals are much less likely than Caucasians to have the opportunity to develop an understanding of what is actually involved with agriculture. This is supported by Talbert and Larke (1995) who found that few minority students have a 4-H or farm/rural background which results in a lack of early, positive images of agriculture.

### **Years in University**

A student's time in university appears to have a positive influence on their overall perception of agriculture, as it has a coefficient equal to 0.117 (Table 2.3). As the number of years a student has attended university increases, the perception that student has of agriculture is much more likely to be positive, regardless of students' field of study. It is important to note that the students surveyed in this study are fairly spread out as to the year of study that they were completing. Of the 232 students surveyed, 26.3% were in their first year, 19.8% in their second year, 19.0% in their third year, 24.1% in their fourth year and 10.8% in their fifth or more year of study.

As students stay longer in university, their knowledge and experience with agriculture may increase as they study agriculture or interact with agriculture students. Having gained this knowledge, and a better understanding of agriculture, students may begin to change their views of agriculture. As a result this better understanding of agriculture may help improve a student's perception of agriculture, as suggested by the results in this study.

### **Environmental Variables**

#### **Rural Landscapes**

The variable rural landscapes has a positive sign with a value of 0.048, but was not statistically significant (Table 2.3). Even though the variable is not significant it may still influence an individual's perception of agriculture. In this case a student who thinks of

rural landscapes when they think about agriculture is more likely to have a positive perception of agriculture than someone who does not.

### **Environmental Issues**

Students who associated environmental issues with agriculture were more likely to have a positive perception of agriculture, as this variable has a value of 0.487 (Table 2.3). This appears to indicate that students recognize that agriculture places importance on a clean and healthy environment and has taken positive steps to improve the environment. They may see agricultural producers as being stewards of the land and taking actions to ensure a healthy environment for the benefit of themselves and for others. For example, the use of low tillage production to reduce soil erosion, the increasing number of organic and pesticide free farms and producers removing land from production for the creation of wetland areas are all examples that may indicate to students that agriculture has attempted to improve the environment.

### **Agriculture Industry Attribute Variables**

#### **Science**

A student who thinks of science when they think about agriculture is more likely to have a positive perception of agriculture, as the coefficient for this variable is equal to 0.426 (Table 2.3). While some people do not support the use of science in agriculture such as the use of genetically modified (GM) foods or organisms (GMO), or chemicals in food production, others believe science has made positive contributions to agriculture in a number of different ways. Chemicals that allow producers to grow plants and raise animals that are healthier, plants that are better able to survive in varying environments,

provide better yields and have better nutritional value and a large number of job opportunities are all aspects of science in agriculture that are beneficial. By having a positive view of science in agriculture, students are indicating that they believe the benefits of science in agriculture outweigh any drawbacks.

### **Business**

Contrary to science, the variable for business has a negative coefficient with a value of -0.460 (Table 2.3). This means that a student who thinks about business when they think about agriculture is more likely to have a negative perception of agriculture. Students who have a negative perception of agriculture may be associating agriculture with large multi-national agri-food corporations and their perception of negative corporate activities. Students may also be associating agriculture with large, profit oriented farms that are competing with the family farm, thus causing a negative perception of agriculture.

### **Agriculture Industry Job Characteristics**

#### **Manual Labor**

As was expected, students who associated manual labor with agriculture had a lower perception of agriculture, as the coefficient for this variable is equal to -0.472 (Table 2.3). For educated and driven students, manual labor jobs are not as desirable as office jobs and this may have resulted in the negative perception associate with manual labor.

#### **Low Income**

As could be anticipated, the coefficient for low income has a negative value of -0.484 (Table 2.3). This means that a student who associates a low income with agriculture is



less likely to have a positive perception of agriculture. As was the case for manual labor, this is an obvious outcome as students consider money to be a very important job characteristic.

### **Low Job Satisfaction**

Students who feel that agriculture involves low job satisfaction are more likely to have a negative perception of agriculture, as indicated by this variables negative coefficient of  $-0.686$  (Table 2.3). This is a result that should be expected as people want to be happy in the work place. Jobs or professions that offer high levels of satisfaction are often the most desired professions, while those that offer low job satisfaction are generally undesirable. As indicated by this study these statements hold true as those who feel agriculture provides low job satisfaction are less likely to have a positive perception of agriculture.

### **Women/Minorities in the Industry**

Students who feel that agriculture provides a good working environment for women and ethnic minorities are more likely to have a positive perception of agriculture. The coefficient for women is equal to  $0.370$ , while the coefficient for ethnic minorities is equal to  $0.366$  (Table 2.3). As was the case for the job quality attributes this too was an expected result. People of all ethnic backgrounds and genders feel that women and ethnic minorities should be given equal opportunity to be employed in each different industry. People generally have higher perceptions of industries that offer such opportunities and, as the results indicate, this is true for agriculture.

## ***Marketing Implications***

As shown in Table 2.3, students who viewed agriculture as involving manual labor, low income and low job satisfaction were more likely to have a negative perception of the agriculture. At the same time students who associated science with agriculture and believed that women and visible minorities were provided good working environments in agriculture had a positive perception of agriculture. Such perceptions, both positive and negative, can have a significant impact on a student's choice of faculty. The information collected in this study on students' perception of agriculture can be used in a faculty's marketing efforts.

The first approach in using this information would be to highlight the positive images that students have of agriculture by emphasizing factors that they associate most positively with agriculture. A good working environment for women and minorities, science in the industry and rural landscapes can be incorporated in a faculty's marketing efforts in order to reinforce a positive image of agriculture. This positive image would provide an incentive for students to enter a faculty of agriculture and may lead to increased enrollment.

The second approach is to provide positive information on the negative aspects of agriculture in their marketing efforts. For example, by showing students that agriculture can provide a highly satisfying career, with a desirable income and little manual labor, agriculture faculties would improve the image that students have of agriculture and possibly attract more students to enroll in their faculty.

## **Summary**

This paper examined the perceptions of university students regarding agriculture and the underlying factors that may influence this perception. The study applied an ordered probit regression with 232 survey data responses that were collected in Canada. The respondents consisted of students in an agriculture faculty (22.8%) and students in non-agriculture faculties (77.2%). Information on students' perceptions of agriculture is important for an agriculture faculty's strategic marketing efforts as student enrollment determines allocations of university budgets and funding among faculties. Therefore it is essential that agriculture faculties understand why enrollment has been in decline and determine ways to increase their student enrollment.

The results indicate that students have a perception of agriculture that is positive (Table 2.2). On a five point Likert scale the average student responses was equal to 3.74, which is between the responses of neutral and agree to the statement that they have a positive perception of agriculture.

There was a small difference in perception between agriculture and non-agriculture students. Agriculture students had a slightly more positive perception of agriculture while non-agriculture students had a lower, but positive perception of agriculture. This appears to imply that the faculty a student is enrolled in is not a major factor in determining whether a student has a positive or negative perception of agriculture.

Several aspects of agriculture were also examined to identify the underlying factors affecting student's overall perception of agriculture. The findings suggest that the following factors have a positive effect on a student's perception: students who are Caucasian, the number of years a student has been in university, students who associated rural landscapes with agriculture, students who associated environmental issues with agriculture, students who associated science with agriculture, students who believed that women are provided a good working environment in agriculture and students who believed that minorities are provided a good working environment in agriculture (Table 2.3).

Factors that had a negative influence on a student's overall perception of agriculture included students who are Aboriginal, students who associated business with agriculture, students who associated manual labor with agriculture, students who associated low income with agriculture and students who associated low job satisfaction with agriculture (Table 2.3). These findings provide valuable insight for university agriculture faculties trying to determine how to attract more students. While students had a positive perception of agriculture there were several aspects of agriculture that students associated negatively with agriculture.

In order to provide the most benefit to student enrollment, university faculties should take note of which aspects of agriculture were positively regarded and which were negatively regarded. By reinforcing the positive perceptions that students have while at the same

time trying to improve and change the negative perceptions, university faculties of agriculture may be able to increase student enrollment.

**Table 2.1 Probit Model Variable**

Variable	Response
<p><b><u>Dependent</u></b></p> <p>Perception of agriculture</p>	<p>= 1 if respondent strongly disagrees that they have a positive perception of agriculture</p> <p>= 2 if respondent disagrees that that they have a positive perception of agriculture</p> <p>= 3 if respondent is neutral that that they have a positive perception of agriculture</p> <p>= 4 if respondent agrees that that they have a positive perception of agriculture</p> <p>= 5 if respondent strongly agrees that they have a positive perception of agriculture</p>
<p><b><u>Socio-demographic</u></b></p> <p>Caucasian</p> <p>Aboriginal</p> <p>Year in University</p>	<p>= 1 if respondent is Caucasian</p> <p>= 0 if respondent is not Caucasian</p> <p>= 1 if respondent is Aboriginal</p> <p>= 0 if respondent is not Aboriginal</p> <p>= 1 if respondent is in First year of study</p> <p>= 2 if respondent is in Second year of study</p> <p>= 3 if respondent is in Third year of study</p> <p>= 4 if respondent is in Fourth year of study</p> <p>= 5 if respondent is in Fifth or more year of study</p>
<p><b><u>Environmental</u></b></p> <p>Rural Landscapes</p> <p>Environmental Issues</p>	<p>= 1 if respondent thinks of Rural Landscapes when they think of agriculture</p> <p>= 0 if respondent does not think of Rural Landscapes when they think of agriculture</p> <p>= 1 if respondent thinks of Environmental Issues when they think of agriculture</p> <p>= 0 if respondent does not think of Environmental Issues when they think of agriculture</p>

Variable	Response
<b><u>Industry Attributes</u></b>	
Science	= 1 if respondent thinks of Science when they think of agriculture = 0 if respondent does not think of Science when they think of agriculture
Business	= 1 if respondent thinks of Business when they think of a career in agriculture = 0 if respondent does not think of Business when they think of a career in agriculture
<b><u>Job Characteristics</u></b>	
Manual Labour	= 1 if respondent thinks of Manual Labour when they think of a career in agriculture = 0 if respondent does not think of Manual Labour when they think of a career in agriculture
Low Income	= 1 if respondent thinks of Low Income when they think of a career in agriculture = 0 if respondent does not think of Low Income when they think of a career in agriculture
Low Job Satisfaction	= 1 if respondent thinks of Low Job Satisfaction when they think of a career in agriculture = 0 if respondent does not think of Low Job Satisfaction when they think of a career in agriculture
Women in Industry	= 1 if respondent strongly disagrees that agriculture provides a good working environment for women = 2 if respondent disagrees that agriculture provides a good working environment for women = 3 if respondent is neutral that agriculture provides a good working environment for women = 4 if respondent agrees that agriculture provides a good working environment for women = 5 if respondent strongly agrees that agriculture provides a good working environment for women

<b>Variable</b>	<b>Response</b>
Minorities in Industry	= 1 if respondent strongly disagrees that agriculture provides a good working environment for minorities = 2 if respondent disagrees that agriculture provides a good working environment for minorities = 3 if respondent is neutral that agriculture provides a good working environment for minorities = 4 if respondent agrees that agriculture provides a good working environment for minorities = 5 if respondent strongly agrees that agriculture provides a good working environment for minorities



**Table 2.2** Students' Perception of Agriculture

	<b>*Strongly Disagree</b>	<b>*Disagree</b>	<b>*Neutral</b>	<b>*Agree</b>	<b>*Strongly Agree</b>
<b>Agriculture Students</b>	3.77%	3.77%	3.77%	24.53%	64.15%
<b>Non-Agriculture Students</b>	4.47%	7.26%	31.28%	43.58%	13.41%
<b>All Students</b>	4.31%	6.47%	25.00%	39.22%	25.00%

\*Response to Statement, "I have a positive perception of agriculture"

**Table 2.3** Specific Perceptions of Agriculture

	Variable	Coefficient	SE	t-value
<b>Socio-demographics</b>	Caucasian	**0.624	0.170	3.678
	Aboriginal	*-0.758	0.443	-1.713
	Year in University	**0.117	0.053	2.220
<b>Environmental</b>	Rural Landscapes	0.048	0.200	0.241
	Environmental Issues	**0.487	0.216	2.254
<b>Industry Attributes</b>	Science	*0.426	0.254	1.674
	Business	** -0.460	0.182	-2.532
<b>Job Characteristics</b>	Manual Labour	** -0.472	0.169	-2.792
	Low Income	* -0.484	0.261	-1.856
	Low Job Satisfaction	** -0.686	0.316	-2.175
	Women in Industry	**0.370	0.095	3.895
	Minorities in Industry	**0.366	0.091	4.043

McFadden r-square = 0.16

\* Indicates significance at the 10% level

\*\* Indicates significance at the 5% level

## **Chapter 3: A Survey of Student Perceptions for Names of Agriculture Faculties**

### ***Introduction***

In the past two decades there has been a decline in the level of student enrolment in many faculties (colleges, schools and programs) of agriculture across universities in both Canada and the U.S. While the exact cause of this reduction is difficult to determine, one area that is often overlooked by those seeking to attract students to a faculty is that of a first impression. Often, the first impression a student has of a faculty comes in the form of a name. A proper or attractive name may impact whether a student will look further into that program or go in another direction. If a faculty has a less suitable name, then its resources spent on marketing may be less effective.

Therefore, the purpose of this paper is to examine potential names, for an agriculture faculty, that are appealing to students. A preference survey of varying names, both including and excluding the word “agriculture,” was used to gain an accurate description of the perceptions held by students. Additionally, students’ general perceptions of agriculture were analyzed to gain an insight into how agriculture faculty stakeholders may wish to choose a faculty name.

### ***Background***

The authors are not aware of any research conducted in the area of university student perceptions of the names of university agricultural faculties. However there are studies that may be relevant to this topic, which examine the names of universities, products or

corporations rather than university faculties. These studies show that names can have an impact on consumer perception of a product and are therefore important to the consumer purchasing decision.

Morphew (2002) studied various colleges and universities in an attempt to determine which colleges became universities and why. He found that a name change from college to university represented a change over time from a focus on undergraduate level studies to graduate level studies. This study highlights the importance of a name when attracting potential students. This study suggests students are likely to associate a "university" with a higher level of learning than a "college" leading students to develop a negative image of a "college."

A second study, published by Grewal, Krishnan, Baker and Borin (1998), examined the effects of store name, brand name and price discounts on a consumer's purchase intentions. This study revealed that the name of a store does influence a buyer's perception of that store. This is important for this study, as a faculty name may have some similarities to a store name and a faculty name can have a significant impact on the students' image of the faculty. A well perceived faculty name would likely result in a student having a more positive perception of a faculty and therefore increase the possibility that this student would consider entering the faculty.

Bristow and Asquith (1999) examined the effect of brand name on perceptions of Hispanic and Anglophone consumers for a variety of products, including sunglasses, blue

jeans and book bags. They found that Hispanics were more influenced by the names of products than Anglophones for a majority of the products tested. This is important for university faculties as potential university students come from many different ethnic backgrounds and they may be influenced by faculty names. It may be important to consider cultural or socio-demographic attributes when attempting the best possible university faculty name to attract potential students.

While there are a number of studies that examine the importance of names in attracting consumers, few studies have looked at the importance that a name can have for attracting potential students to a university or a university faculty. Few have considered the importance of the name of a university agriculture faculty in student recruitment. This study will take a closer look at this issue and provide perspective that may help understand the importance of agriculture faculty names with regards to student recruitment.

### ***Data Collection***

The data for this analysis was collected through a survey questionnaire that was administered on the University of Manitoba campus, in Winnipeg, Canada. The data was collected in University Centre, a general meeting place for students from all faculties. Students were randomly approached to conduct the survey and were voluntary participants. Additional responses were obtained from students in the Faculty of Agriculture. Agriculture students were surveyed in order to ensure a comparison could be made between agriculture and non-agriculture students. No student was forced to take part in the survey as it was completely voluntary.

In total, 232 responses were collected over a two day period. Of those 232 respondents, 22.8% were enrolled in an agricultural faculty while the remaining 77.2% were enrolled in faculties other than agriculture. The survey questionnaire entails four sections: socio-demographics, environmental aspects of agriculture, agriculture industry attributes and agricultural job characteristics. The questions were presented in two different forms, five-point Likert scale and ranking.

### ***Methodology***

The study entails two types of analysis. The first is descriptive statistics which is used to determine the preference of students, both agriculture and non-agriculture, for the name of an agriculture faculty. Students were asked to rank seven names for a faculty of agriculture.

The second part of the analysis uses factor analysis to identify possible perceptions that students have regarding agriculture. Factor analysis will allow the discovery of the basic structure underlying the set of measures found in the survey (Kinnear and Taylor, 1996). In other words, it will allow the grouping of similar perception variables into one factor which may be closely associated with student name preferences. It is then possible to use these preferences to create or alter an agricultural faculty's name to reflect these perceptions.

Factor analysis is a method of transforming a group of variables into new non-correlated variables called factors (Aaker et al, 2001). Each factor is a linear combination of its

original variables. Factors are arranged in order of decreasing variance and as a result the first factor is the most informative while the last factor is the least informative. For example, if variables A, B and C were highly correlated they may be represented by a factor. If variables D, E and F are highly correlated and different from the variables in the first factor, they could be represented by another factor (Kim and Boyd, 2004). Simply put, factor analysis is a procedure that takes a large number of variables or objects and searches to see whether they have a small number of factors in common which account for their inter-correlation (Kinneer and Taylor, 1996).

## ***Results***

### **Section 1: Faculty Name Preference**

#### ***Combined Results (Agriculture and Non-Agriculture Students)***

Students were asked to choose from a list of seven potential faculty names and the results showed that students prefer a faculty name that has some reference to agriculture (Table 3.1). The top two choices for a faculty name, Agricultural Sciences and Agribusiness (22.84%) and Agricultural and Food Sciences (17.24%), both contained a reference to agriculture. However, the two choices that made no reference to agriculture, Life Sciences (11.21%) and Food Systems (10.78%), were least preferred by the students. These results are interesting, since it is believed by some that the general population has a negative or indifferent perception of agriculture.

In a separate question, within the survey, the participants were asked if their perception of agriculture was positive and to rank their perception on a five-point Likert scale. The results, shown in Figure 1, show that students tended to agree that they have a perception

of agriculture that is positive. This positive perception of agriculture may contribute to students' choice of names containing the word "agriculture."

The most preferred faculty name, Agricultural Sciences and Agribusiness (22.84%) (Table 3.1), addresses both the scientific and the business/economic sides of the faculty. This is an interesting choice as it may reflect that students are interested in different options that an agriculture faculty has to offer. It may be beneficial for agriculture faculties to represent their agribusiness/agricultural economic programs in their faculty names. This is especially true if such programs make up a considerable part of their faculty.

### ***Agriculture Students Results***

The results for the agriculture students were very similar to the overall combined results (Table 3.1). The agriculture students chose the same faculty name, Agricultural Sciences and Agribusiness (37.74%), as was seen in the combined results. One major difference between the combined results and the agriculture students' results was the preference for the name Life Sciences. In the combined results the names containing Life Sciences did reasonably well (11.21%), ranking as high as third, while agriculture students were relatively unresponsive of the names that mentioned Life Sciences. This may be a result of agriculture students viewing Life Sciences as covering a more broad area, including faculties such as human nutritional sciences or even medicine, in addition to business and science.



### ***Non-Agriculture Students Results***

The results for the non-agriculture students were very similar to the combined results. The most preferred name remained the same with the top ranked faculty name being Agricultural Sciences and Agribusiness (18.44%). There were only slight differences between the combined and non-agriculture rankings and those differences were only by a few percentage points. This outcome was to be expected as non-agriculture students comprise a majority of the students surveyed.

### ***Comparing Agriculture and Non-Agriculture Students***

While the differences between the two separated groups and the combined results have been shown, it is of interest to analyze the differences between the two separated groups. For the faculty name, the two groups showed some differences as only one name received similar levels of support. The name Food Systems and Agribusiness was supported by both 9.43% of agriculture students and 11.73% of non-agriculture students (Table 3.1).

For other names, such as the ones referring to life science, comparing agriculture and non-agriculture students showed a wider difference in name perception. For example, Life Science and Agribusiness was supported by 18.44% of non-agriculture students, while 3.77% of agriculture students supported the name (Table 3.1). This may be due to different interpretations of life science, by agriculture and non-agriculture students.

While agriculture students may view life science as an area outside of the agriculture industry, non-agriculture students may connect life science with the agriculture industry, as the non-agriculture students may have limited experiences with agriculture.

While both groups of students selected Agricultural Sciences and Agribusiness as their top selection, there were some differences in the level of support from each group. 37% of agriculture students prefer this name while 18.44% of non-agriculture students prefer this name. Additionally, agriculture students overwhelmingly supported the names that contained the word or abbreviation of the word agriculture while the other names that included life science or food systems were less favored.

## **Section 2: Analysis of Students' Perception of Agriculture vs. Life Science Careers**

As previously mentioned, it is important for stakeholders to consider what certain names or words represent in the minds of students. In order to understand and explain this importance, a cross-tab analysis on two questions from the survey was conducted. The first question asked the students what their perception was of the career of an Agriculture graduate, while the second question asked what their perception was of the career of a "Life Sciences," graduate. The words "Life Sciences," were chosen as they seem to be appearing more and more in the names of faculties of agriculture across North America.

The options for each question were farmer/farm related work, working in a rural area, science/business or other. Looking at the results of these questions reveals significant difference in the perceptions of careers in agriculture and careers in life sciences. The students viewed an agriculture graduate as having a career involving farm related work, as well as rural work (62.50%, Figure 3.2). The name Life Sciences had a much different perception in the eyes of students, as they view such a faculty's graduates having a career

related to science and business (62.07%, Figure 3.2). The number of students that believe an agriculture graduate is involved in science or business (34.91%, Figure 3.2) is lower than the number of students who believe a graduate of a life sciences program will work in an area related to science and business. Additionally, students believed that a life science graduate is less likely to be working on a farm or in a rural area (34.05%, Figure 3.2).

As was the case for the selection of a faculty name, the results from these questions were separated into agriculture and non-agriculture students. Major differences in career perception can be seen when comparing these results. Only about 44% of agriculture students thought that a career in agriculture meant a career on the farm or in a rural environment (Figure 3.3). In contrast 70% of non-agriculture students associated a career in agriculture with work on a farm or in a rural area (Figure 3.4). Additionally, while just over 50% of agriculture students thought a career in agriculture involved a career in science or business (Figure 3.3), only 30% of non-agriculture students felt the same way (Figure 3.4). This is an important result, illustrating that a majority of non-agriculture students associate an agricultural career as being involved in farming or working in a rural environment.

The perceptions of a career a life science has also been examined based on two separate groups. Regarding a career in life science, agriculture students view it least associated with farming and rural work, while non-agriculture students link it more with farming and rural work. Overall agriculture students tend to link agricultural careers more with

science and business, while non-agriculture students connect a career in agriculture more with farming or rural work

This once again shows how important a name can be in attracting potential students. In this case, students who are looking toward a scientific or business related career would be much more inclined to look at a Life Sciences faculty than an Agriculture Faculty, even though they might be one and the same.

### **Section 3: Factor Analysis of Influences on Students' Preference for Faculty Names**

Given that students appear to prefer a faculty name containing the word "agriculture," in their top two choices for a faculty name, factor analysis is used to identify students' perceptions regarding opportunities and concerns that they associate with agriculture. Factor analysis allows the determination of basic structure of the set of measures used in this survey (Kinnear and Taylor, 1996). It reduces a large number of variables into smaller groups of variables called factors. Each factor is comprised of variables that are highly correlated and, in this case, reflect student perceptions of agriculture. These factors may then be used by agriculture faculty shareholders to choose a faculty name that appeals to these student perceptions.

As shown in Table 3.2, which displays the rotated factor matrix, the sample size is equal to 232 (N=232) with 15 observable variables. The table was generated through the Principal Component Analysis extraction method and the Varimax rotation method. SPSS 12.0 was used to perform the analysis. Using Guttman's Eigenvalue criterion and a

scree plot a total of five factors were determined. Each variable in the factors has a factor loading, which has some similarities to a correlation coefficient and represents how much each variable contributes to that factor (Hatcher, 1994). Therefore a variable that has a factor loading that is higher than another variable, contributes more to the factor.

### ***Importance of Factor Analysis***

Factor analysis results provide a better understanding as to opportunities and concerns that students relate to the word “agriculture.” These opportunities and concerns can affect student perceptions of an agriculture faculty, which in turn can influence their decision whether or not to enter such a faculty.

The first factor grouping, favorable opportunities for women and minorities, contains the variables that examine the image of job opportunities in agriculture for women (.775), image of job opportunities in agriculture for minorities (.627), image of opportunities in agriculture faculties for women (.803) and image of opportunities in agriculture faculties for minorities (.765) (Table 3.2). As shown above, the factor loadings for each of the individual variables are closely related in size, with factor loadings in parentheses. One slight difference can be seen between the image of opportunities for women and minorities, as the loadings for women (.775) are higher than the respective loadings for minorities (.627), indicating that the women variable contributes slightly more toward the factor than the minorities’ variable. All of these variables are regarded as representing a positive image and, as a result, students positively associate opportunities for women and minorities in agriculture with the word “agriculture.”

The second factor grouping, concerns regarding agriculture, is different than the first group in that its variables represent negative attributes of agriculture. This factor grouping contains two factors, environmental concern and concern of large scale farms (Table 3.2). Within the environmental concern factor are three variables: association of agriculture with the family farm (.491), association of agriculture with rural landscapes (.712) and association of agriculture with environmental issues (.475) (Table 3.2). The variable association of agriculture with the family farm is found in this factor as students may associate a decline in the number of family farms with an increased number of larger, more polluting farms that are a concern for the environment. Similarly, the variable association of agriculture with rural landscapes is found in this factor as students may not associate clean and natural rural environments with agriculture. Instead they may see agriculture, through its use of chemicals and intensive livestock production, as being a polluter of the environment and therefore an environmental concern. Within the concern of large scale farms factor there are two variables: association of agriculture with the family farm (.695) and association of agriculture with large scale farms (.922) (Table 3.2). The variable association of agriculture with the family farm is found in this factor as students may associate the reduction in the number of family farms with an increase in the number of large scale farms. As a result, students may believe that large scale farms are a concern as they are contributing to the decline of the more traditional and friendlier family farm. While students have an overall view of agriculture that is positive, as shown in Figure 3.1, these factors represent negative attributes of agriculture and therefore

students may negatively associate this particular factor grouping with the word “agriculture.”

The third and final factor grouping in this factor analysis considers job opportunities in agriculture. There are two variables found within the positive association of business with agriculture variable: association of agriculture with business (.881) and association of agriculture with good income (.567) (Table 3.2). The other factor in this factor grouping is quality of jobs in agriculture, which has two variables as well: association of agriculture with good income (.872) and association of agriculture with high job satisfaction (.415) (Table 3.2). These factors both reflect positive student perceptions of agriculture and therefore students associate a positive business aspect and favorable job opportunities with the word “agriculture.”

With the top two preferred faculty names containing the word “agriculture,” it is important to understand the image that the word is portraying. As shown through factor analysis, students have positive perceptions of agriculture providing favorable opportunities for women and minorities and favorable job opportunities, although there are specific concerns related to large farms and the environment. By understanding these student perceptions of the word “agriculture,” agricultural faculties may be better able to focus on the positive aspects of students’ perceptions of agriculture and therefore direct their promotional and marketing efforts in a more cost efficient manner. By highlighting and promoting the positive perceptions that students have of agriculture and while trying

to overcome the negative perceptions, faculties may be able to attract more potential students and improve student enrollment.

## **Summary**

This paper examined the preferences of university students regarding names for agriculture faculties. The study applied descriptive statistics and factor analysis, using 232 survey data responses that were collected in Canada. The respondents consisted of students in an agriculture faculty (22.8%) and students in non-agriculture faculties (77.2%). The results indicate that students prefer a faculty name that includes a reference to both science and agribusiness. Students also prefer faculty names that have some reference to agriculture, as names with the word agriculture were selected by 51.72% of students (Agricultural Sciences and Agribusiness (22.84%), Agricultural and Food Sciences (17.24%), Agri-Sciences and Agribusiness (11.64%)) (Table 3.1). A majority of students (64.22%) were found to have a positive perception of agriculture, which would explain their attraction to names containing the word agriculture (Strongly agree (25%), Agree (39.22%)) (Table 3.1).

Given limited resources that are available for marketing and promotion of academic programs, it is important that these funds are used effectively. If the name of a faculty is a deterrent to students and the faculty is marketing that name, then that faculty is actually providing a disincentive to students trying to decide on a faculty to enter. Therefore, it is important that faculties have a proper name, not only to attract students, but to also ensure efficient use of faculty funds. There are several important results from this paper that can be used to market an agricultural faculty.



The first and possibly most important implication is how a faculty name refers to the programs that it offers. Many faculties currently only refer to either science or agribusiness in their name, but do not include both. By not including both, faculties may be missing potential students, many of whom may not realize the scientific or agribusiness opportunities that these faculties present. This is supported by the survey results, as students preferred a name that indicates that a faculty offers both science and agribusiness programs (22.84%, Table 3.1). Therefore, it is likely beneficial to a faculty of agriculture to include a reference to both science and agribusiness in their faculty name.

A second implication for the marketing of agricultural faculties is that the use of the word agriculture appears to not be a deterrent. This study reveals that overall, students have a positive perception of agriculture (average of 3.74, Figure 3.1) and this is supported by their preference for names containing the word agriculture (51.72%, Table 3.1).

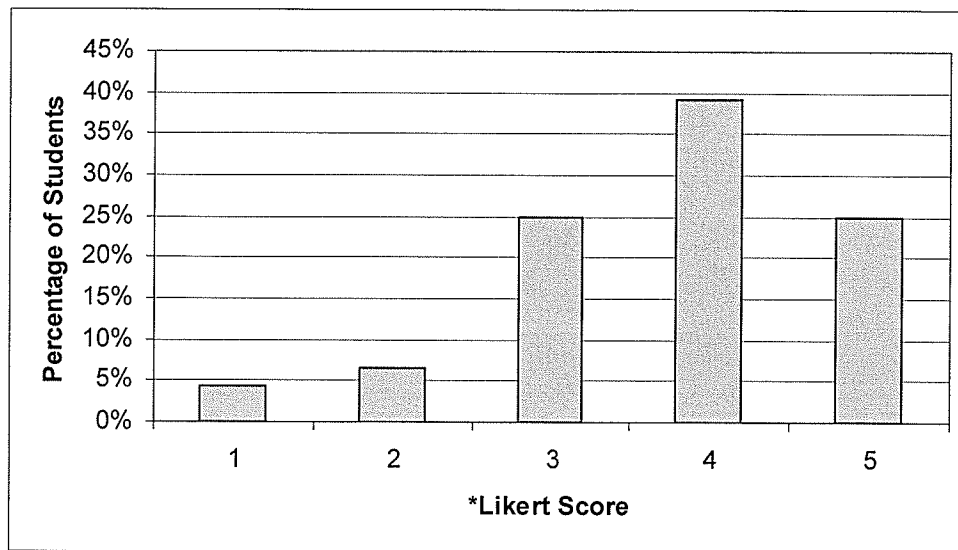
However that is not to say using the word agriculture in the faculty name is not without its drawbacks. While students were not deterred by the word agriculture, they did have a fairly strong belief as to the type of career experienced by an agriculture graduate. A majority of students associated such a career with working on a farm or rural area and not in science or business (62.50%, Figure 3.2). Therefore, it is not likely in the best interest of a faculty to simply call itself a faculty of agriculture. Instead it may be more beneficial to use the word agriculture in conjunction with the words science and agribusiness.

The final implication in this study examines student perceptions that were categorized into dimensions, using factor analysis. Results showed that perception/minority interests, business and career characteristics were positive perception dimensions found to be significant to students regarding agriculture, while large scale farms and environmental concerns were negative dimensions (Table 3.2). It is important that faculties focus on the positive factors or dimensions in agriculture when undertaking marketing efforts, as the word “agriculture,” was included in the top two faculty names selected by students (Table 3.1).

**Table 3.1** Student Name Preferences for an Agriculture Faculty

Name	Student Segment		
	All Students	Agriculture Students	Non-Agriculture Students
	%	%	%
Agricultural Sciences and Agribusiness	22.84%	37.74%	18.44%
Agricultural and Food Sciences	17.24%	26.42%	14.53%
Life Sciences and Agribusiness	15.09%	3.77%	18.44%
Agri-Sciences and Agribusiness	11.64%	22.64%	8.38%
Life Sciences	11.21%	0.00%	14.53%
Food Systems and Agribusiness	11.21%	9.43%	11.73%
Food Systems	10.78%	0.00%	13.97%

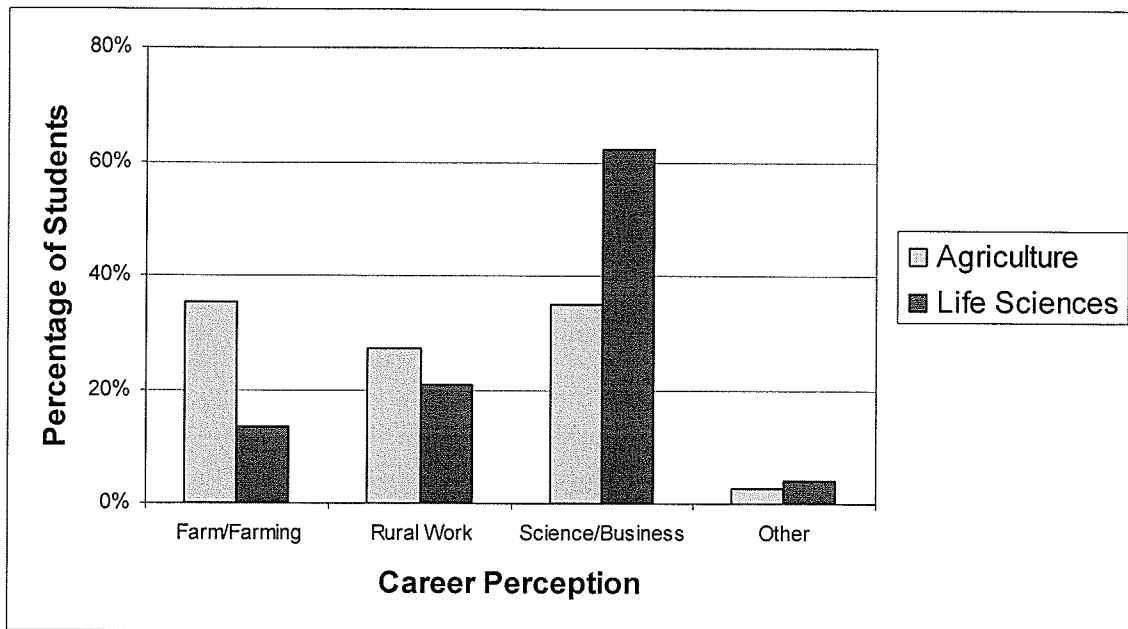
**Figure 3.1** Student Perception of Agriculture



\*(1 = lowest perception value, 5 = highest perception value)

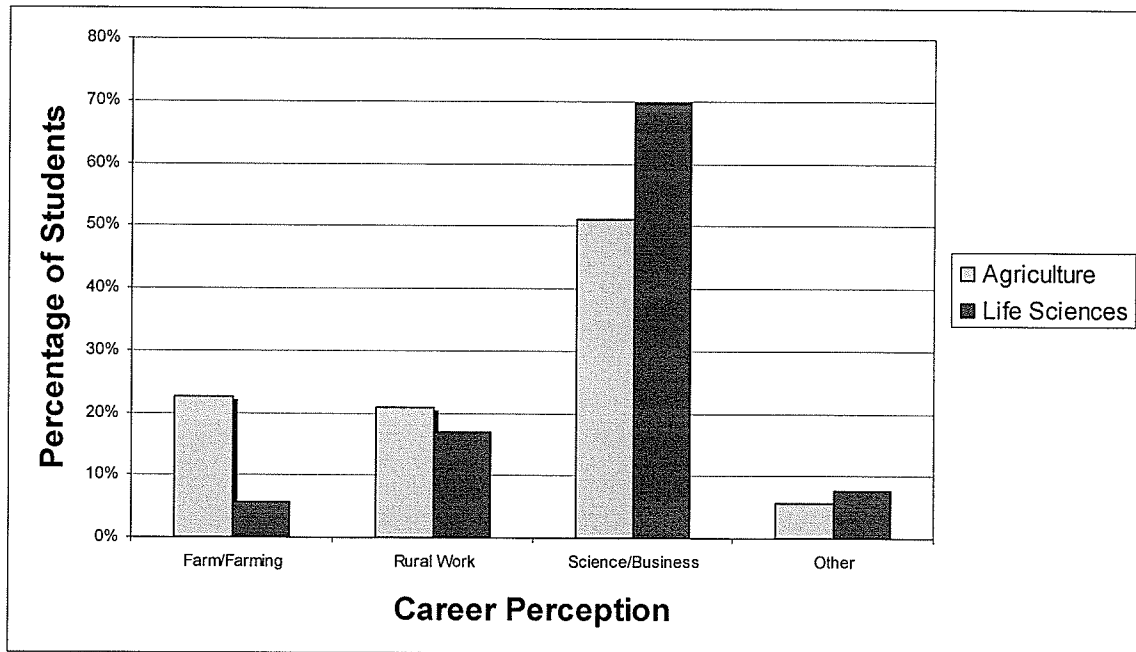
**Figure 3.2** Combined Students Perception of Agriculture vs. Life Science Career

Percentage of Students



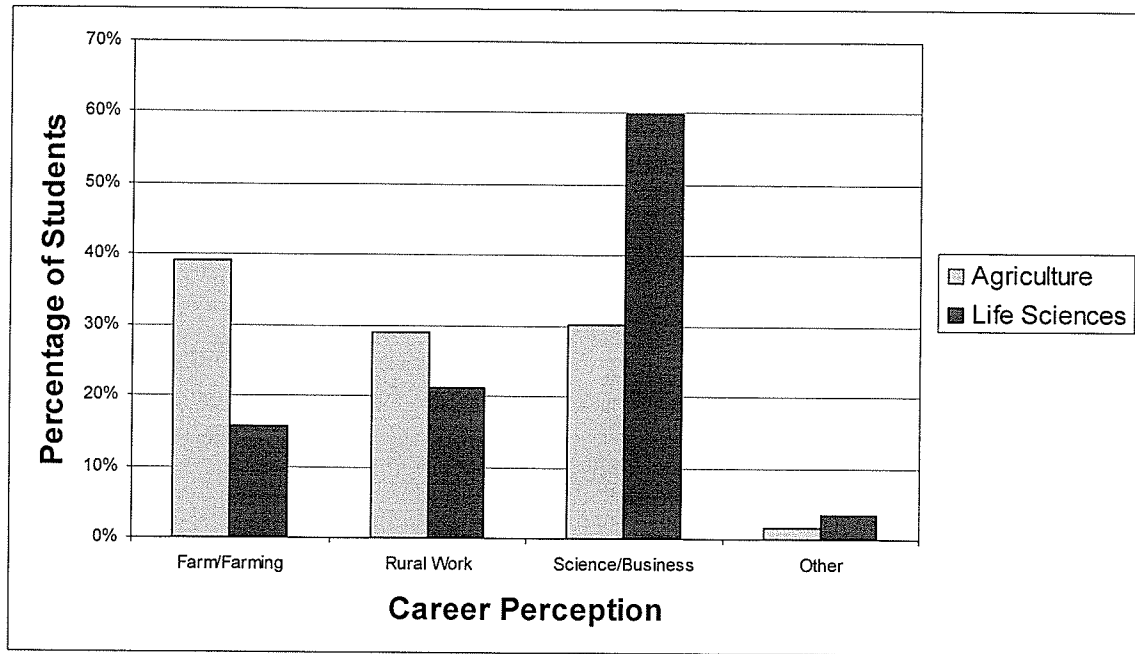
**Figure 3.3** Agriculture Students Perception of Agriculture vs. Life Science Career

Percentage of Students



**Figure 3.4** Non-Agriculture Students Perception of Agriculture vs. Life Science Career

Percentage of Students



**Table 3.2** Factor Loadings: Analysis of Students' Perceptual Dimensions of Agriculture

Observed Variables (Survey Questions)	Factor Groupings				
	Group 1: Favorable Opportunities for Women and Minorities in Agriculture	Group 2: Concerns Regarding Agriculture		Group 3: Favorable Job Opportunities in Agriculture	
	Factor 1 Favorable Opportunities for Women and Minorities in Agriculture	Factor 2 Environmental Concern	Factor 3 Concern of Large Scale Farms	Factor 4 Positive Association of Business with Agriculture	Factor 5 Quality of Jobs in Agriculture
Association of Agriculture with the Family Farm*		0.491	0.695		
Association of Agriculture with Rural Landscapes		0.712			
Association of Agriculture with Environmental Issues		0.475			
Association of Agriculture with Large Scale Farms			0.922		
Association of Agriculture with Business				0.881	
Association of Agriculture with Good Income					0.872
Association of Agriculture with High Job Satisfaction*				0.567	0.415
Image of Job Opportunities for Women in Agriculture	0.775				
Image of Job Opportunities for Minorities in Agriculture	0.627				
Image of Opportunities for Women in Agriculture Faculties	0.803				
Image of Opportunities for Minorities in Agriculture Faculties	0.765				

\*Variable for which score scales were reversed, in order to maintain consistency among variables

Note: A 6<sup>th</sup> factor, science, was identified but was removed as it only contained one variable  
Extraction Method: Principal Component Analysis. Rotation Method: Varimax.



## **Chapter 4: A Survey of Student Perceptions for Names of Departments of Agricultural Economics and Agribusiness**

### ***Introduction***

In the past two decades there has tended to be a steady decline in the level of student enrolment in many departments of agricultural economics across universities in both Canada and the U.S (Blank, 1998). While the exact cause, or causes, of this reduction is difficult to determine, one area that is often overlooked by those seeking to attract students to a university department is that of a first impression. More often than not that first impression a student has of a department comes in the form of a name.

University departments often expend considerable funds in efforts to attract both undergraduate and graduate students, often including both domestic and international students. In the case of universities the first contact a student has with a department is through its name, whether it is in a brochure, pamphlet or registration guide. As a result, a proper or attractive name may impact whether a student will look further into that program, or go in another direction. If a department has a less suitable name, then its resources spent on marketing, no matter how much, are likely to be less effective.

The purpose of this paper is to examine potential names for an agribusiness/agricultural economics department that are appealing to students. A survey of alternative department names is used to determine which names of a department that students most preferred.

## ***Background***

The authors are not aware of any research conducted in the area of university student perceptions of specific names of university agricultural economics or agribusiness departments. However, there are studies which examine aspects that are relevant to the naming of an agricultural economics or agribusiness department.

Blank (1998) found that many undergraduate programs in agricultural economics have moved toward an agribusiness curriculum. This study is important as it highlights the need for agricultural economics and agribusiness departments to maintain a name that positively and accurately reflects its program of study. If the core attributes of these programs are changing, as this study suggests, then some agricultural economics and agribusiness departments may wish to examine or alter their names to reflect what their program is actually offering and what it may wish to offer in the future.

This is further supported by Heiman, Miranowski, Zilberman and Alix (2002) who concluded that students' interests have shifted away from traditional economics and toward agribusiness and resource economics. By maintaining the same name, which reflects agricultural economics, agricultural economics and agribusiness departments may possibly be providing some disincentive to the students whose interests are now more focused on agribusiness and on broader economic areas such as consumer and food economics, environmental economics and resource economics. By selecting a more current name that reflects these changing student interests, faculty stakeholders may be able to attract more potential students.

A third study which examined changes in agricultural economics and agribusiness departments was conducted by Dooley and Fulton (1999), who found that agricultural economics has not recently been and is not expected to be as high an enrollment area as agribusiness. Additionally, they found that more agricultural economics programs have experienced declines in enrollment when compared to agribusiness programs and may continue to do so in the future. This study further shows that agribusiness is beginning to and may become the primary teaching area in agricultural economics and agribusiness programs.

In addition to these three papers there are other studies that examine the issue of changes occurring for agribusiness and agricultural economics departments. Connor (1996) concluded that management/business can be expected to continue as a major program in agriculture faculties. Akridge, Dobson and Holschuh (1994) found that many graduate agriculture economics programs have increased their focus on agribusiness management and that departments of agricultural economics have an important role to play in agribusiness graduate and professional education arena. Woolverton and Downey (1999) determined that students have shifted to agribusiness programs and found opportunities in the agribusiness industry, but that employers in the industry continue to face a lack of qualified job applicants. Furthermore, they highlight this void of applicants as an opportunity for university agribusiness departments to continue their strong increases in student enrollment, which they have been experiencing in recent years.

While few studies have considered student preferences for specific names of a university agricultural economics or agribusiness department, there are studies that provide valuable insight into why the names of such departments need to be re-evaluated. As these departments move toward a more agribusiness approach, from traditional agricultural economics, it is important to maintain a name that represents the department and the programs it is offering. This, combined with shifting student interests, provides sufficient incentive for departments to alter or change their agricultural economics and agribusiness department names in order to improve student enrollment and better reflect their program of study. This study will take a closer look at this issue and provide a perspective that may help understand the importance of agricultural economics or agribusiness department names with regards to student recruitment.

### ***Data Collection***

The data for this analysis was collected through a survey questionnaire that was administered at the University of Manitoba in Winnipeg, Canada. The data was collected in University Centre, a general meeting place for students from all faculties. Students were randomly approached to conduct the survey and were voluntary participants. Additional responses were obtained from students in the Faculty of Agricultural and Food Sciences. Agriculture students were surveyed in order to ensure a comparison could be made between agriculture and non-agriculture students. No student was forced to take part in the survey as it was completely voluntary.

In total, 232 responses were attained over a two day period. Of those 232 respondents, 22.8% were enrolled in an agricultural faculty while the remaining 77.2% were enrolled in faculties other than agriculture.

The survey questionnaire entails four sections: socio-demographics, environmental aspects of agriculture, agriculture industry attributes and agricultural job characteristics. The questions were presented in three different forms, including five-point Likert scale, binary scale and ranking.

## ***Methodology***

The analysis used in this study is based upon descriptive statistics which is used to determine the preference that students, both agriculture and non-agriculture, have for the name of an agribusiness/agricultural economics department. Students were asked to rank a set of seven names for an agribusiness/agricultural economics department.

## ***Results***

### **Agribusiness/Agricultural Economics Department Name Preference**

#### ***Combined Results (Agriculture and Non-Agriculture Students)***

The highest ranked name, Agribusiness and Applied Economics (32.76%), received more than double the count for the next highest name (Table 4.1). The reason behind this outcome may be a little difficult to explain, but may lie in the students' perception of the word "applied." One complaint that students in any department sometimes have is that some of the material being taught in classes has limited application, as it will not be regularly used upon graduation. The word "applied" indicates to students that the material being taught is applicable and useful in the career path that they have chosen.

As a result students may be more comfortable entering a program that they believe is going to be beneficial to their career.

Another interesting aspect of students' preference for department names is the use of the word "agriculture." The only name which contained the word "agriculture," Agribusiness and Agricultural Economics, ranked second to last and was preferred by only 7% of students (Table 4.1). The reason for this outcome may lie in the students' perception of the agriculture industry and the career that it entails. If students believed that agriculture did not present many opportunities in the business field, then such a name would not be beneficial to a department. In order to determine whether or not students believed that agriculture involved a business aspect a separate survey question was asked. The results indicated that students did not think of business when thinking of agriculture, as only 25% of the students responded that they thought of business when they thought of agriculture (Figure 4.1). Since a majority of the students did not associate agriculture with business, they also may not prefer a name for an agribusiness/agricultural economics department that contained the word "agriculture."

### *Agribusiness Students*

The results show that agribusiness students prefer the same name, Agribusiness and Applied Economics (39.62%), as all students (Table 4.1). As was explained earlier, the reason for this preference may stem from the perception of the word "applied." Students may feel that such a word refers to a program that offers training that is applicable to real

world applications, which is a desirable attribute, and as a result be enticed by such a name.

A second name with a strong showing is the name “Agribusiness and Consumer Economics,” which was preferred by almost 30% of agriculture students (Table 4.1). One explanation for the support of this name may lie in the perception that agriculture students have of the agriculture industry, as well as their perceptions of consumers. Agriculture students may view the word “consumer,” as being an appropriate word for the name of a department as they may associate agricultural products with consumer food products. If this is the case then agriculture students would likely have a positive view of a name containing the word “consumer,” which is shown to be true in the results of this paper.

One name that was not well received by agriculture students was “Agribusiness and Resource Economics,” which was preferred by less than 2% of agriculture students (Table 4.1). This is somewhat surprising as many people associate agriculture with natural resources as the industry relies on the natural environment for growing crops and raising livestock. However, it may be that agriculture students have a different view of the words natural resources, maybe more related to geological or environmental science. As a result the agriculture students might feel that natural resources does not accurately represent an agricultural department and, as shown in the results, reject such a name.

### ***Non-Agriculture Students Results***

The results for the non-agriculture students were very similar to the combined results with the top ranked business/economic department name being “Agribusiness and Applied Economics,” (30.73%, Table 4.1). There were only slight differences between the combined and non-agriculture rankings and those differences were only by a few percentage points. This outcome was to be expected as non-agriculture students comprise a majority of the students surveyed.

### ***Comparing Agriculture and Non-Agriculture Students***

There are a few differences between agriculture and non-agriculture students with regards to preferences for the name of an agribusiness/agricultural economics department. The major difference occurred over two of the seven name options. Agriculture students were much more receptive to the name, “Agribusiness and Consumer Economics,” selecting that option 28.3% of the time (Table 4.1). This is compared to non-agriculture students who chose that name only 8.38% of the time (Table 4.1). This difference may be the result of the perceptions the two groups have about agriculture and about the word “consumer.” As noted earlier, many agriculture students may view the word “consumer,” as being an appropriate word in the name of an agricultural economics or agribusiness department, as they may view agricultural and consumer food products as being related. However, the opinions expressed by those outside of the agriculture faculty may offer a different viewpoint. Those students, who did not receive the consumer economics name as well as the agriculture students, may perceive consumer economics as being a field found in an economics or marketing department rather than in a faculty of agriculture.



They therefore did not prefer a consumer economics name for an agribusiness or agricultural economics department.

The other major difference in terms of the department name was the name “Agribusiness and Resource Economics.” This option was selected by 15.64% of non-agriculture students, while only 1.89% of agriculture students selected this name (Table 4.1). To explain this difference it is once again important to consider differing perceptions. To the non-agriculture students, who gave the name more support, such a name may represent the natural resources that are associated with agriculture. Fields of flowing crops, green pastures and livestock operations all bring to mind natural resources. With these images in mind the non-agriculture students would consider an agribusiness/agricultural economics department to be a resource economics department. However, as noted earlier, resource economics may have a different perception in the eyes of agriculture students. To these students it may represent more of a geological or environmental type of economics.

### ***Marketing Implications***

University departments have a limited amount of money to spend each year, within which a certain amount is set aside for marketing and promotional activities. To many university departments the amount of money available for marketing is small compared to their needs. As a result, it is important that departments use their funds effectively, including those for marketing. Some departments could be misallocating their money if they are trying to market a department whose name is less favorable. If the name of a department is unfavorable to students, then that department is actually providing a

disincentive to students trying to decide on a department to enter. Therefore it is important that departments have a proper name, not only to attract students, but to also ensure efficient use of marketing and recruitment funds.

For agribusiness/agricultural economics departments, students viewed the name “Agribusiness and Applied Economics,” as being the most appealing by a large margin (32.76%, Table 4.1). The key to this name appears to be the word “applied.” Using that word seems to indicate to the students that the program offers an education that will be useful to their careers. With this in mind it is apparent that agribusiness/agricultural economics departments may benefit by having the word “applied,” in their department name.

### **Summary**

This study has used descriptive statistics to gain a better understanding of student preferences for agribusiness/agricultural economics departments. In total, 232 survey data responses were collected with the respondents consisting of students in an agriculture faculty (22.8%) and students in non-agriculture faculties (77.2%).

The results show that a large percentage of students (32.76%) prefer a name for an agribusiness/agricultural economics department that includes the word “applied” (Table 4.1). An explanation for this preference may be that a name with the word “applied,” represents a program that is offering an education that is focusing on skills that will be used in the workforce. Since this is a desirable program quality, students were attracted to this name.

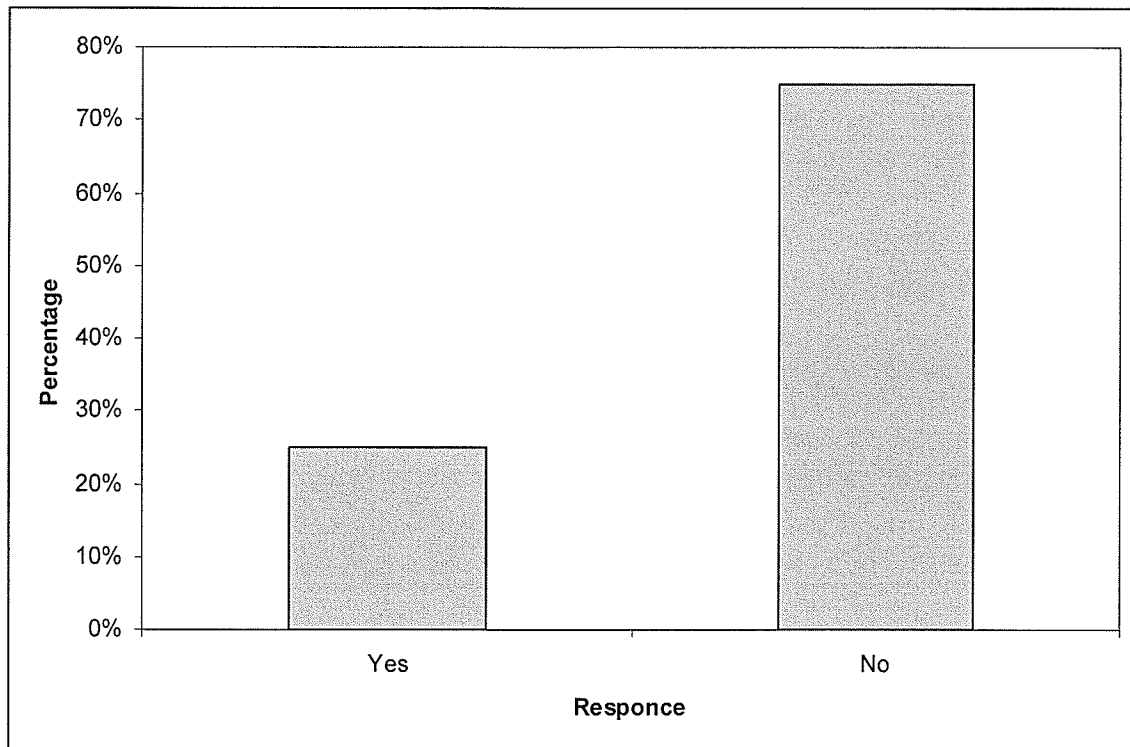
There were names that students did not respond positively to and they include the name that makes reference to agriculture. This may have been a result of students not correlating agriculture and business with one another. This finding was further supported by a separate question in which students were asked whether they associate agriculture and business with one another. The results show that only 25% of all students believe that agriculture and business are associated with one another and this may have been a significant factor in students not preferring the name which makes reference to agriculture.

The results in this paper provide some insight into how students perceive names of university agricultural business/economics departments. The results may be used by department stakeholders to gain knowledge about university agricultural economics and agribusiness department names and provide some guidance in selecting a new department name or revising a current department name. By doing so department stakeholders may be able to select a department name that best reflects their department and students interests, thereby creating a name that will attract potential students and increase student enrollment.

**Table 4.1** Student Name Preferences for an Agribusiness/Agricultural Economics Department

	All Students	Agriculture Students	Non-agriculture students
Name	%	%	%
Agribusiness	15.95%	13.21%	16.76%
Agribusiness and Applied Economics	32.76%	39.62%	30.73%
Agribusiness and Environmental Economics	12.50%	11.32%	12.85%
Agribusiness and Resource Economics	12.50%	1.89%	15.64%
Agribusiness and Agricultural Economics	6.90%	3.77%	7.82%
Agribusiness and Consumer Economics	12.93%	28.30%	8.38%
Agribusiness and Managerial Economics	6.47%	1.89%	7.82%

**Figure 4.1:** Students Who Associate Agriculture with Business



## Chapter 5: Summary

The papers in this thesis have provided an insight into the perceptions that university students have of the agriculture industry and of university faculties of agriculture and agricultural economics and agribusiness departments. These perceptions no doubt influence a student's enrollment decision and can lead a student to either enter or not enter a faculty of agriculture or agricultural economics and agribusiness departments. By relating this study to their own programs, university agriculture faculties may be able to increase their enrollment by highlighting these perceptions in their marketing efforts. The data used in these studies was collected through a survey questionnaire that was administered on the University of Manitoba campus, in Winnipeg, Canada. The data obtained was then used to create an ordered probit model and a factor analysis model, in addition to providing descriptive statistics.

In the first paper students' overall perception of agriculture and their perception of different aspects of the agriculture industry were examined. From this analysis it was determined that students overall, both agriculture and non-agriculture, have a perception of agriculture that is positive. This paper also identified several factors that may influence a student's perception of agriculture, both positively and negatively. Positive factors included students who are Caucasian, the number of years a student has been in university, students who associated rural landscapes with agriculture, students who positively associated agriculture with the environment, students who associated science with agriculture, students who believed that women are provided a good working

environment in agriculture and students who believed that minorities are provided a good working environment in agriculture.

Negative factors influencing student perceptions of agriculture included students who are Aboriginal, students who associated large scale business corporations with agriculture, students who associated manual labor with agriculture, students who associated low income with agriculture and students who associated low job satisfaction with agriculture.

The second paper in this study is concerned with names of agricultural faculties. This paper found that there are certain faculty names that students find appealing, while there are others that may prove to deter students. Students preferred faculty names that highlighted the scientific and business aspects of agriculture, while they were less likely to prefer names that referred to Food Systems or Life Sciences. Also examined in this paper were dimensions of student perceptions of agriculture, which are important, as students preferred names that contained the word "agriculture." Results showed that perception/minority interests, business and career characteristics were positive perception dimensions found to be important to students regarding agriculture, while large scale farms and environmental concerns were negative dimensions. Finally this paper examined differences in career perceptions that students had when they were presented with potential faculty names. It was found that students related the career of an Agriculture Faculty graduate with farming or rural work, while a Life Sciences graduate was viewed to have a career in science or business.

The third and final paper examined student perceptions of agricultural economics and agribusiness department names. The students' most preferred name, "Agribusiness and Applied Economics," indicated that students prefer an agricultural economics and agribusiness department name that portrays an education that is applicable to a student's career. The paper also found that students least preferred the names "Agribusiness and Agricultural Economics," and "Agribusiness and Managerial Economics."

In summary, this thesis has attempted to provide an insight into how students perceive the agriculture industry and names of university agriculture faculties and agribusiness departments. By analyzing student perceptions, this study has provided significant background information for university agriculture faculties looking to alter their marketing efforts to improve student enrollment. By using the results found in the papers presented, university agriculture faculties may be able to improve student enrollment by appealing to the positive aspects of students' perceptions regarding agriculture.



## References

- Aaker, D.A., Kumar, V., and Day, G.S. (2001). *Marketing Research* (7th ed.). New York: John Wiley & Sons.
- Akridge, J., Dobson, W. and Holschuh, M. (1994). Positioning Agricultural Economics Departments to Serve Agribusiness Graduate and Professional Education Markets. *American Journal of Agricultural Economics*, 76(5), 1193-1198.
- Blank, Steven C. (1998). A Decade of Decline and Evolution in Agricultural Economics Enrollments and Programs, 1985-96. *Review of Agricultural Economics*, 20(1), 155-167.
- Bristow, D. and Asquith, J. (1999). What's in a Name? An Intracultural Investigation of Hispanic and Anglo Consumer Preferences and the Importance of Brand Name. *Journal of Product and Brand Management*, 8(3), 185-203.
- Connor, J. (1996). Undergraduate Teaching of Management in Agricultural Economics Departments: Discussion. *American Journal of Agricultural Economics*, 78(5), 1238-1241.
- Dennis, F. (2000). An Ordered Probit Analysis of Public Values for Use in Multiple Objective Decision-Making. *Computers and Electronics in Agriculture*, 27, 127-137.
- Dooley, F. and Fulton, J. (1999). The State of Agribusiness Teaching, Research and Extension at the Turn of the Millennium. *American Journal of Agricultural Economics*, 81(5), 1042-1049.
- Frick, M., Birkenholz, R., and Machtmes, K. (1995). Rural and Urban Adult Knowledge and Perceptions of Agriculture. *Journal of Agricultural Education*, 36(2), 44-53.
- Frick, M., Birkenholz, R., and Machtmes, K. (1995). 4-H Member Knowledge and Perception of Agriculture. *Journal of Agricultural Education*, 36(3), 43-49.
- Frick, M., Birkenholz, R., Gardner, H., and Machtmes, K. (1995). Rural and Urban Inner-City High School Student Knowledge and Perception of Agriculture. *Journal of Agricultural Education*, 36(4), 1-9.
- Grannis, J., and Thilmann, D. (2002). Marketing Natural Pork: An Empirical Analysis of Consumers in the Mountain Region. *Agribusiness*, 18 (4), 475-489.
- Grewal, D., Krishnan, R., Baker, J. and Borin, M. (1998). The Effect of Store Name, Brand Name and Price Discounts on Consumers' Evaluations and Purchase Decisions. *Journal of Retailing*, 74(3), 331-352.

- Hatcher, L. (1994). A Step-by-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling. Cary, NC: SAS Institute Inc.
- Heiman, A., Miranowski, J. Zilberman, D. and Alix, J. (2002). The Increasing Role of Agribusiness in Agricultural Economics. *Journal of Agribusiness*, 20(1), 1-30.
- Humphrey, J., Stewart, B., and Linhardt, R. (1994). Preservice Elementary Education Majors' Knowledge of and Perceptions Toward Agriculture. *Journal of Agricultural Education*, 35(2), 27-30.
- Jones, K., Bowen, B., and Rumberger, C. (1998). Influence of Student and School Factors on African American Enrollment in Agricultural Science Courses. *Journal of Agricultural Education*, 39(2), 39-49.
- Kim, R., and Boyd, M. (2004). Identification of Niche Market for Hanwoo Beef: Understanding Korean Consumer Preference for Beef using Market Segment Analysis. *International Food and Agribusiness Management Review*, 7(3), 1-19.
- Kinney, T.C., and Taylor, J.R. (1996). *Marketing Research: An Applied Approach* (5th ed.). New York: McGraw-Hill.
- Matthews, B., and Falvey, L. (1999). Year 10 Students' Perceptions of Agricultural Careers: Victoria (Australia). *Journal of International Agricultural and Extension Education*, 6(1), 55-67.
- Morphew, C. (2002). A Rose by Any Other Name: Which Colleges Became Universities. *The Review of Higher Education*, 25(2), 207-223.
- Newsom-Stewart, M., and Sutphin, H. (1994). How Tenth Grade Students Perceive Agriculture and Environmental Science: Comparison by Gender and Ethnicity. *Journal of Agricultural Education*, 35(3), 50-56.
- Roosen, J., Lusk, J., and Fox, J. (2003). Consumer Demand for and Attitudes Toward Alternative Beef Labeling Strategies in France, Germany and the UK. *Agribusiness*, 19 (1), 77-90.
- Statistics Canada (January 2003). *2001 Census: Analytic Series, Aboriginal Peoples of Canada: A Demographic Profile*. Retrieved August 18, 2005 from, Web site: [www12.statcan.ca/english/census01/products/analytic/companion/abor/contents.cfm](http://www12.statcan.ca/english/census01/products/analytic/companion/abor/contents.cfm)
- Statistics Canada (November 06, 2003). *Selected Cultural and Labour Force Characteristics (58), Age Groups (5A), Sex (3), and Visible Minority Groups (15), for Population 15 Years and Over, for Canada, Provinces, Territories and Census Metropolitan Areas, 2001 Census -20% Sample Data*. Retrieved August 18, 2005 from Web site: <http://www12.statcan.ca/english/census01>

Statistics Canada (March 2005). *Population Projections of Visible Minority Groups, Canada, Provinces and Regions*. Retrieved August 18, 2005 from Web site: <http://www.statcan.ca:8096/bsolc/english/bsolc?catno=91-541-X>

Talbert, B., and Larke, A. (1995). Factors Influencing Minority and Non-Minority Students to Enroll in an Introductory Agriscience Course in Texas. *Journal of Agricultural Education*, 36(1), 38-45.

West, G., Larue, B., Touil, C., and Scott, S. (2001). The Perceived Importance of Veal Meat Attributes in Consumer Choice Decisions. *Agribusiness*, 17 (3), 365-382.

Woolverton, M. and Downey, W. (1999). A Look at Agribusiness Education Since the National Agribusiness Education Commission's 1989 Report: The Lincoln Report Revisited. *American Journal of Agricultural Economics*, 81(5), 1050-1055.

Wright, D., Stewart, B., and Birkenholz, R. (1994). Agricultural Awareness of Eleventh Grade Students in Rural Schools. *Journal of Agricultural Education*, 35(4), 55-60.