A SURVEY

Background, Career Objectives and Performanc Of Students in Introductory Animal Science

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Introduction

Those who are involved with teaching introductory Animal Science courses are aware of the many changes that have occurred and are occurring in the student make-up of classes. There have been several reports that have stated the increasing number of urban students majoring in Agriculture (Anderson and Elkins, 1978; Burger and Brandenburg, 1979; Mayer, 1980; Mortensen, 1981; Waldren et al., 1983). We must recognize these changes and be willing to restructure courses to meet the needs and expectations of these students.

At Texas A&M University, approximately 1000 students are enrolled each year in Animal Science 107, a two hour lecture, and in Animal Science 108, a two hour-one credit laboratory. This number of students in a single introductory course provided an excellent data base to (1) determine the students background and experience with animals prior to entering college, (2) determine the career objectives of these students and how they perceive the opportunities available in Animal Science and (3) relate the students performance in the introductory course to various measures of performance prior to entering college.

Before proceeding further, it should be emphasized that this study deals with a general survey of the course. It is not intended to be a detailed analysis to prove that Animal Science majors are statistically smarter (or less smart) than students of any other major. Obviously, class composition, background and career interests may be different at other universities. However, many of the trends observed in this study would apply to students in agricultural colleges and universities across the country.

Materials and Methods

The records of 967 students who were enrolled in the introductory Animal Science course at Texas A&M University during the 1983-84 academic year were evaluated. Students were asked at the beginning of the course to supply information on their background, experience with farm animals and career interests. Admission records of these students were used to obtain SAT scores, high school quarter rank, high school class size and self-reported high school grades in English, Math and Biology.

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Results and Discussion

Table 1 illustrates the distribution of students in the course by classification. We have traditionally thought of the course as a freshman course, but less than one-half (47.6%) of the students were classified as freshmen. Many of the sophomores and most of the juniors and seniors were students from other majors, or they were transfer students who had recently transferred into Animal Science.

Table 1. Numbers in Introductory Course by Classification.

Classification	Number	Percent
Freshman	460	47.6
Sophomore	327	33.8
Junior	130	13.4
Senior	37	3.8
Other	13	1.4
Total	**967**	**100.0**

Table 2 contains the number and percent of students in the course by major. Other majors including Chemistry, Business Analysis, Petroleum Engineering and Physical Education take the introductory course, but these students represent only about 5% of the total enrollment. The remaining 95% are in some area of agriculture or general studies. Approximately one-fourth (26.7%) of the students were Animal Science majors with a similar number majoring in Agricultural Economics (23.1%) and Biomedical Science (28.2%). The course is required of all Animal Science majors, most Agricultural

Table 2. Numbers in Introductory Course by Major.

Major	Number	Percent
Agricultural Economics	223	23.1
Agricultural Education	35	3.6
Agricultural Journalism	16	1.7
Agronomy	12	1.2
Animal Science	258	26.7
Biomedical Science	273	28.2
Food Science	5	.5
General Studies	48	5.0
Horticulture	5	.5
Poultry Science	4	.4
Range Science	24	2.5
Wildlife and Fisheries	10	1.0
Zoology	4	.4
Other*	50	5.2
Total	**967**	**100.0**

* Chemistry, Business Analysis, Petroleum Engineering, Electrical Engineering, Physical Education.

Economics majors and is one of the pre-professional course requirements for admission to the College of Veterinary Medicine. This explains the high percentage of Biomedical Science students. In later tables, only majors from Agricultural Economics (AGEC), Agricultural Education (AGED), Animal Science (ANSC) and Biomedical Science (BIMS) will be presented. These majors comprised more than 80% of the course enrollees.

Table 3 contains information on the background and career objectives of the students. We were aware of an increasing number of non-farm students in the course, but the fact that 71% of the class indicated no previous farm background was larger than expected. This should not be surprising considering the large number of majors other than Animal Science. However, sixty-three percent of the Animal Science majors indicated no farm background, a trend which has increased significantly in the past 20 years. We expect this trend to continue in the future since large numbers of students are from major metropolitan areas such as Houston and Dallas.

Table 3. Farm Background and Career Objectives of Students.

Item	Total class		ANSC majors	
	Number	Percent	Number	Percent
Farm background:				
Yes	278	28.7	95	36.8
No	689	71.3	163	63.2
Ambition:				
Raise livestock	129	13.3	63	24.4
Animal industry	135	14.0	32	12.3
Veterinarian	417	43.2	152	59.0
Agri-business	158	16.3	3	1.2
Human medicine	31	3.2	0	—
Teaching	32	3.3	0	—
Undecided	65	6.7	8	3.1

It is also interesting to note the career objectives of students and to observe the large number of students whose primary objective is to become a veterinarian. Forty-three percent of the class and 57% of the Animal Science majors listed Veterinary Medicine as their career objective. One of the challenges of advisors and counselors comes with the realization that less than 5% of these students will be accepted into the College of Veterinary Medicine. We must continue to make students aware of the challenges and opportunities that are available to them. Many students from urban areas have no real concept of the career possibilities or job opportunities that are available in the various fields of agriculture and often require further counseling in order to make a wise career choice.

Table 4 is a further reflection of the lack of previous animal experience by most of the students. Considering the large, farm animal species, most students had the most experience with cattle and horses. Although this experience may vary in other regions of the country, two to three years of experience would be considered "limited" with regard to animal agriculture. A significant point to be considered is the lack of experience evident in Biomedical Science students who aspire to become veterinarians. Their experience is largely limited to dogs and cats and probably reflects the type of practice they will be interested in establishing.

Table 4. Average Years of Experience With Animals by Major.

Major	Type of experience					
	Beef	Dairy	Swine	Sheep	Horses	Dog & cat
AGEC	2.74	.36	.98	.81	2.31	5.31
AGED	3.41	.48	2.31	1.34	2.84	6.42
ANSC	2.52	.52	.94	.77	3.42	6.36
BIMS	.83	.21	.32	.29	1.97	9.88

In an effort to relate students' performance at the introductory college level to SAT scores and other measures of high school performance, correlations were made between the variables (Table 5). SAT scores were significantly correlated with grades received in lecture and lab as well as all other variables. Grades in lecture and lab were significantly correlated with high school grades but had no relation to high school class size. After reviewing the correlations in Table 5, it should be pointed out that they offer limited information concerning class performance. For example, the correlation between SAT scores and grade received in lecture ($r = .27$) tells us that the higher the SAT score, the better the grade received in lecture. However, the r^2 statistic would tell us that more than 90% of the variation in grades received in lecture is due to something other than SAT scores. SAT scores are useful tools to assist in advising students; however, they are probably more a reflection of what a student has been exposed to rather than a reflection of the student's learning ability.

Summary of Conclusions

1. Only 37% of the Animal Science majors indicated a farm background before entering college in comparison to 29% of the total class.
2. The majority of the Animal Science majors (59%) and 43% of all students listed Veterinary Medicine as their career objective.

Table 5. Correlations Between University and High School Performance.

Variable	1	2	3	4	5	6	7	8
1. SAT score	1.00	.27**	.25**	-.24**	.15**	.22**	.26**	.21**
2. Grade in lecture[a]		1.00	.73**	-.31**	.03	.24**	.27**	.23**
3. Grade in lab[a]			1.00	-.29**	-.06	.24**	.24**	.28**
4. HS quarter rank[b]				1.00	.02	-.37**	-.39**	-.29**
5. HS class size					1.00	-.14**	-.07	-.06
6. HS English grade[c]						1.00	.36**	.29**
7. HS math grade[c]							1.00	.34**
8. HS biology grade[c]								1.00

[a] A=4, B=3, C=2, D=1, F=0.
[b] High school quarter rank (1=top quarter, 2=second quarter, etc.).
[c] Self-reported grades (A=4, B=3, C=2, D=1, F=0).
**(P<.01).

3. Students indicated an average of less than three years experience with any class of animals other than dogs and cats.
4. Grades received in lecture and lab were significantly correlated with SAT scores and high school academic performance, but were unrelated to high school class size.

Literature Cited

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Special Considerations With Enterprise Laboratories

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Despite many other advances and changes occurring within higher education, instructors continue to count on effective laboratory support as an essential and basic dimension for teaching and learning.

Laboratories are of as many different shapes, sizes and descriptions as there are laboratories. With the occupational emphasis found in many of the academic offerings of two-year colleges or technical institutes, the enterprise laboratory holds a special appeal as a replica of the real world. Realism makes enterprise laboratories an exciting educational tool that is in high demand by faculty for motivating and preparing students through discovery and experience. However, enterprise laboratories require special considerations by educational administration, particularly if we are to achieve the most educational support for dollars spent.

Common Attributes of Laboratories

Whatever the laboratory, I believe we can agree there are certain basic common attributes. Some of these are:

1) In general, laboratories are more expensive and more complex than the usual classroom, seminar or conference room arrangement.
2) Laboratories have a direct impact on the quality and amount of educational yield in related teaching activities.
3) Laboratories are valuable and effective only in as much as they are expertly utilized by the faculty and students.
4) Good laboratory instruction like all instruction of merit simply does not occur unless carefully planned and supported by thorough involvement of faculty and students.
5) There are inherent non-instructional benefits to the total institution as a result of outstanding laboratories.

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Enterprise Laboratories

Over the past twelve years the Agricultural Technical Institute has developed an impressive set of laboratories for a small institution.

In addition to the twenty-two traditional laboratories for chemistry, botany, soil science, nutrition and similar agriculturally related laboratories, the Institute has also developed five major enterprise laboratories with a value in land, facilities, equipment, plants and animals between 4 and 5 million dollars. Specifically these five enterprise laboratories consist of:

1) An 1800 acre Apple Creek farm including:
   a. Swine operation; 80 sows - farrow to finish - 1500 hogs annually.
   b. Cow/calf operation - 150 brood cows plus feeding floor - 125 to 500 head yearly.
   c. Cropping program over 900 acres plus hay production on approximately 400 acres.
   d. Sawmill and 450-500 acres of woodlands.
2) Dairy operation - 56 head — moving to 75 head on line with a new one million dollar dairy under construction in April 1986.
3) 100 head horse operation - standardbred, pleasure horse and breeding with new breeding facilities under construction Spring 1986.
4) 400 bee colonies for pollination and honey production — pollinates adjacent Agriculture Research Center crops — moved into new teaching laboratory in 1985.
5) Horticulture enterprises including over 20,000 square feet under glass or plastic for production and specimen production. Also 10 acre nursery at Apple Creek Farm.

The 1985-86 operating budget exclusively for the five enterprise laboratories will exceed $600,000 not counting faculty and support personnel salaries involved in their operation.