THE EFFECT OF VOCATIONAL AGRICULTURE CLASS ENROLLMENT AND FARM EXPERIENCE ON ANIMAL SCIENCE KNOWLEDGE OF FIRST YEAR STUDENTS ENROLLED IN OKLAHOMA COLLEGES OF AGRICULTURE

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

As more knowledge becomes available and necessary for students to master, it becomes more important to determine the levels of known knowledge of a subject matter before grouping students into sections. Many schools and colleges in the institutions of higher education group students according to their abilities and aptitudes.

There are many factors that determine the level of knowledge possessed by students when entering institutions of higher education. In institutions of higher education some schools or colleges use certain prescribed criteria to group students into various sections of courses.

With more knowledge becoming available within the field of animal science, it seems practical to determine what previous experiences and abilities will best prepare the student for a study of animal science. This level of student knowledge may be measured by a test formulated to measure proficiency in animal science.

By grouping students into homogeneous capability groups, a more motivating condition for total learning by the entire enrollment may be created. It would allow the more capable students to advance at a faster rate, thereby creating a greater challenge

Nature of the Problem

Additional research in animal science makes an increasing amount of

information available each year for students to grasp and to understand. By placing students into homogeneous groups, students with similar background and understanding would achieve more total learning. Students with higher level capabilities and an understanding of animal science could advance at a more rapid level of learning, while those with less capabilities and understanding would advance at a rate commensurate with their understanding.

Students studying in the various departments of the Colleges of Agriculture in institutions of higher education in Oklahoma do not have the opportunity to take a pre-test to determine their proficiency in animal science at the time of entrance to college. This precludes the possibility of obtaining advance credit in any agricultural course. This study is exploratory in nature and has the purpose of determining certain factors which contribute to students' understanding and knowledge of animal science as measured by an examination.

Objectives of the Study

This study was designed to achieve the following basic objectives:

1. To determine the effect of vocational agriculture training in high school on the student's proficiency in animal science as measured by a proficiency test in animal science.
2. To determine the effect of other agricultural experiences on the student's proficiency in animal science as measured by a proficiency test in animal science.
3. To determine the relationship between high school grade point average and the student's proficiency in animal science as measured by a proficiency test in animal science.

4. To determine the relationship between the ACT composite percentile score of the student and the proficiency in animal science as measured by a proficiency test in animal science.

Scope and Limitations of the Study

One major limitation of the study was that of its being an exploratory study. An exploratory study "has the purpose of formulating a problem for more precise investigation or of developing hypotheses."[1] This study was to give a general look at a problem and to determine the feasibility of further research in the area of animal science. Since the study was exploratory in nature, it was confined to all students enrolled for the first time in the schools or colleges of agriculture in the institutions of higher education during the fall semester of 1965-66 at the following institutions:

1. Oklahoma State University
2. Northwestern State College
3. Panhandle Agriculture and Mechanical College
4. Cameron State Agricultural College
5. Connors State Agricultural College
6. Eastern Oklahoma Agricultural College
7. Murray State Agricultural College
8. Northeastern Agricultural and Mechanical College
9. Northern Oklahoma Junior College

This study was limited to determining the competencies of students

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[1] Claire Selltiz, Marie Johoda, Morton Deutsch, and Stuart Cook, Research Methods in Social Relations (New York: Holt, Rinehart and Winston, Inc., 1962), p. 51.

in animal science and to isolate the contributing factors affecting such knowledge.

Definition of Terms

For the purposes of this study the terms listed below are used as indicated:

1. ACT score - The composite American College Testing Program percentile ranges from one to ninety-nine and nine tenths per cent. It serves as a means to estimate how an individual or a group scores in comparison to a total group.
2. Animal science score - The animal science score represents the per cent of correct answers based on a possible one hundred per cent. The score resulted from an animal science proficiency test formulated by the writer to measure the understanding and the knowledge of animal science. The details of formulation and validation are in Chapter III.
3. Agricultural work experiences - These are work experiences in which students participate and which contribute to their knowledge and understanding of agriculture.
4. Farm experience - This term represents the total experience of farm life obtained by living on a farm within the past five years. There is no limitation as to the size of farm or the type of farm.
5. First year agriculture college student - These are students who are enrolled in their first semester at schools or colleges of agriculture in institutions of higher education in Oklahoma.

6. High school grade point average - The student's average high school academic grade point was based on A = 4, B = 3, C = 2, D = 1 and others = 0.

CHAPTER II

REVIEW OF LITERATURE

One purpose of a testing program is to attempt to measure ability and to secure necessary information for ranking one person as being better or worse than another person in a given situtation. To be of real value, the ranking must be based on dependable scores from dependable tests.

According to the Committee on Measurement Evaluation which is associated with the American Council on Education, tests have proved to be useful in predicting success in some of the most common academic areas of liberal arts, law, nursing, dentistry, engineering and medicine. They are being developed for use in predicting academic success in some of the so-called occupational fields either by achievement scores in institution-wide testing or by grade-point ratio. One reason tests do not function at a higher level of prediction is partially due to the failure of colleges to clearly identify the kind of abilities they want differentiated and described. There may also be some failure in the methods of evaluation used to appraise the educational objectives successfully. It is therefore necessary to select tests to fit existing circumstances and to judge the results only after a local effort has been made to adequately describe student achievement. This means that a highly succesful prediction test used in one situation may not necessarily apply in another. Each institution must consider local factors

carefully in setting goals for an efficient testing program.[1]

Validity of Tests

An appraisal instrument is valid if it measures what it claims to measure and a number of techniques are used for validation. VanDalen has stated:

> Logical or curricular validity is obtained when the investigator analyzes the particular ability, skill or course content that he intends to appraise and structures an instrument to measure the various aspects of that factor .... The method of "jury validation" is similar to logical validation except that the items to be included on the test are submitted to qualified experts who rate them as to their importance in contributing to the factor being measured.[2]

Garrett stated that "intelligence and aptitude tests possess content validity in so far as the items in them fulfill the author's definition of what he is measuring".[3]

Some testing specialists have stated, without empirical evidence, that the items on a test should be arranged in increasing order of difficulty, with the easiest items at the beginning. Brenner points out that a series of tests were constructed and the items were arranged in different orders on the basis of their difficulty. The different orders were then compared with respect to difficulty, reliability, and discrimination. In none of the experiments included in this test were the

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[1] The Committee on Measurement and Evaluation of the American Council on Education, College Testing, American Council on Education (Washington, D. C., 1959), pp. 15-16.

[2] Deobold B. Van Dalen, Understanding Educational Research (New York: McGraw-Hill Book Company, Inc., 1962), pp. 264-65

[3] Henry E. Garrett, Testing for Teachers, (New York: American Book Company, 1959), p. 31.

differently ordered tests significantly different in difficulty or in reliability. The differences in discrimination were inconsistent. The results obtained indicated that in the normal classroom situation, arrangement of items by their difficulties will not result in significant differences in any of the attributes evaluated.[4]

Dubnick stated that a three-way analysis of variances showed that interpolation of easy items had no significant effect on test performance. Arrangement of items and level of anxiety did not interact significantly to influence the subject's test performance.[5]

According to Gerbericle, Greene and Jorgensen, achievement tests of highly tangible knowledge and skill outcomes are most often based on content or curricular validity, although tests of such other cognitive outcomes as concepts, understandings and perhaps application may sometimes be similarly founded. A teacher who constructs an evaluation instrument or who carefully selects a standardized test is attempting to insure content validity by making certain that the test (1) deals with the types of educational outcomes he is attempting to achieve and hence wishes to measure and (2) is at the proper level of difficulty. There are various direct and indirect sources of evidence to guide in the consideration of content validity. Among these are textbooks, courses of study,

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[4]Marshall Hallock Brenner, "Test Difficulty, Reliability and Discrimination as Functions of Item Difficulty Order" (unpub. Ed. D. dissertation, Columbia University, 1962).

[5]Lester Dubnick, "Test performance as a Function of Test Anxiety and Item Difficulty (unpub. Ed. D. dissertation, Columbia University, 1962).

reports of committees and writings of subject and test specialists.[6]

Ahmann states that a test possesses content validity to the degree that it adequately samples a defined type of situation or subject matter. In the area of achievement testing, this sample problem is guided and controlled by the table of specifications which attempts to reflect the relative importance of the various sub-categories of subject matter.[7]

For an achievement test to have adequate content validity, it must be composed of test items which in total adequately reflect the relative importance of the cells composing the table of specification. Tests used to reveal the specific strengths and weaknesses of the students before instruction in a specific course is begun are defined by Ross as pretests.[8]

Determination of Academic Success by Various Factors

The counseling of new students may be aided by predictions of academic success based on a combination of the significant pre-admission and placement measures.

Fisher investigated the relationship which existed between certain selected criteria and first semester grade point average at Illinois State Normal University. The independent variables included the high

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[6] J. Raymond Gerberick, Harry A. Greene, and Albert N. Jorgensen, Measurement and Evaluation in the Modern School (New York: David McKay Co., Inc., 1962) p. 54.

[7] J. Stanley Ahmann, Testing Students Achievements and Aptitudes (Washington, D. C.: The Center for Applied Research in Education, Inc., 1962) p. 53.

[8] C. C. Ross, Measurements in Today's Schools (New York: Prentice-Hall, Inc., 1942) p. 370.

school percentile senior class rank, the ACT test scores, the size of the high school class, the high school academic composite and the high school academic units.

The academic composite proved to be the most significant predictor of the five independent variables included in the regression equations. In all three regression equations, the academic composite when combined with the ACT composite, accounted for more of the total variance than did high school class rank when combined with ACT.

Each of the independent variables added significantly to the multiple correlations. Their order of importance was as follows: (a) academic composite, (b) high school standard score, (c) ACT composite, (d) high school units, (e) high school size.

An analysis of covariance design listing the academic composite score as a constant, indicated that there were significant differences between the three environments investigated - selected suburban, metropolis and other.[9]

Dale E. Hassinger found in a study of the relationship of certain measures of scholastic competency and previous scholarship records that predictive variables used without reference to other measures are not reliable, but that a composite of the variables constitutes a moderately reliable basis for the prediction of scholastic achievement in engineering schools.[10]

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[9] James Lee Fisher, "Factors Affecting Academic Success" (unpub. Ph. D. dissertation, Northwestern University, 1964)

[10] Dale E. Hassinger, "The Relationship of Certain Measures of Scholastic Competency and Previous Scholarship Record to Achievement in Calculus in Engineering School at Oklahoma State University" (unpub. Ph.D. dissertation, Oklahoma State University, 1961) p. 23.

The predictive value of the high school grade point average and a select group of standardized tests for junior college achievement was investigated by Morice and his conclusions were: (1) The high school grade point average had considerable predictive value when predicting course grades for Junior college courses. (2) Single correlations between the standardized test scores and junior college course grades were significantly high in most simple correlation studies; therefore, in the majority of instances, the standardized tests were valuable predictive instruments. (3) Various combinations of the high school grade point average and standardized test scores did not yield significantly higher correlations with junior college course grades than the high school grade point average alone.[11]

Brady concluded that the best predictors of academic success in the first two years of college were the total high school average marks in high school social studies and rank in class.[12]

A study by Ryan in the area of Technical Drawing interpreted the results to indicate (1) there was no correlation between the amount of high school mechanical drawing and performance in college technical drawing. (2) College entrance test scores correlate positively with success on the college level and (3) grades earned in a specific course in high school influence success in a specific course on the college

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[11]Herbert Oscar Morice, "The Predictive Value of the High School Grade Point Average and Select Group of Standardized Tests for Junior College Achievement (unpub. Ed. D. dissertation, University of Houston, 1965)

[12]William Joseph Brady, "Twenty Quantitative Predictors of Academic Success in College Measured by Grade Point Average" (unpub. dissertation, The University of Connecticut, 1965)

level. (4) These findings have a broad range of implication for those responsible for curriculum construction and academic counseling as well as those concerned with the instruction of these courses.[13]

In a comparative study of first year academic achievement as related to predicted achievement of freshmen enrolled in elementary education at Frostbury State College, Stansberry found the best predictor of college grade point average was high school grades. The second best single predictor was self prediction.

The American College Test revealed the per cent of students from the total group that would not succeed, but did not identify the precise student who failed in first year college work.[14]

Adkins concluded that high school grade point average was highly predictive of college grade point average, and that other variables - mostly academic but including certain nonintellective factors - also serve somewhat to improve the prediction of college success.[15]

Burns, in an investigation of the value of the American College Testing program, the Scholastic Aptitude and the Purdue Placement Test as predictor of academic success of Purdue University Freshmen concluded: (1) All of the instruments considered provided some significant

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[13]Robert Dale Ryan "A Study of Student Performance in First Year Technical Drawing at St. Cloud State College as Related to Certain High School Courses and ACT Scores" (unpub. Ed. D. dissertation, Colorado State College, 1964)

[14]Charles Wayne Stransberry, "A Comparative Study of First Year Academic Achievement as Related to Predicted Achievement of Freshman Enrolled in Elementary Education at Frostbury State College" (unpub. Ed. D. dissertation, the Pennsylvania State University, 1965)

[15]Arlie A. Adkins, "Prediction of College Success at Middle Tennessee State College" (unpub. Ed. D. dissertation, The University of Florida, 1963)

measure of academic success and when combined with high school rank they all provide a useful addition to the prediction of academic success.[16]

In almost all colleges, test information is, in one way or another, combined with the high school records of the student in reaching a decision about his admission. Extremely few of the selective colleges use test scores alone even for preliminary screening. This is as it should be, for test scores provide only one indication of what a student is like and what he can do.

The American College Testing Program was established to meet the placement, guidance and admission-testing needs of those state colleges and universities which in the past have not been selective.[17]

Review of Agricultural Literature

Freeny states that the most important principles of animal science listed by high school instructors were: Nutrients of food and their use in the animal's body, genetic makeup of animals, role of heredity, vitamins and minerals in animal nutrition, feed requirements of farm animals, inbreeding, crossbreeding, digestion and absorption of food particles, management factors affecting reproductive efficiency of animals and how diseases and parasites spread.[18]

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[16]Richard Lee Burns, "An Investigation of the Value of the American College Testing Program, the Scholastic Aptitude Test and the Purdue Placement Tests as Predictors of Academic Success of Purdue University Freshmen (unpub. Ph. D. dissertation, Purdue University, 1963)

[17]Henry Chauncey and John E. Dobbins, Testing: Its Place in Education Today (New York: Harper and Row, Publishers, 1963) pp. 133-134.

[18]Jimmy Bob Freeny, "The Principles of Animal Science Important for the High School Student Preparing for College, Farming or Some Agricultural Related Occupation" (unpub. M. S. Thesis, Oklahoma State University, 1963)

The college and university instructors felt that high school students should have basic information in the following: The basic function of the animal's body, the general nomenclature of an animal, the digestive tract, the grading of animals, inbreeding, crossbreeding, maintaining animal health, the role of heredity, the digestion and absorption of food particles and the balancing of rations for animals.[19]

In a study of pre-college experiences as preparation for college courses in Agronomy, Beeks determined that: (1) Students without agricultural experiences had significantly higher means on the school and college ability test than those with agricultural experiences.

(2) Students with more than one year of vocational agriculture were better prepared in agronomy than those without such experiences.

(3) Students with more than one year of 4-H experience were better prepared in soils but not necessarily better prepared in field crops.

(4) Students living on a farm for more than two years were better prepared in agronomy than those without the experience.

(5) Students having experience in vocational agriculture but no 4-H were better prepared in agronomy than students with 4-H but no vocational agriculture.

(6) Students with any one of the experiences in agriculture were better prepared in agronomy than those with no agriculture experience.

(7) About forty-eight per cent of the farmer students of vocational agriculture scored above seventy per cent on the examination while nine per cent of the non-vocational agriculture groups scored above seventy per cent on the examination.

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[19] Ibid., p. 18.

(8) Thirty-eight per cent of the students having farm experience scored above seventy per cent on the examination as compared to about six per cent of the non-farm group.

Beeks concluded that students without agricultural experiences appear to have more ability than students with agricultural experiences when measured by the School and College Ability Test. Although with lower college ability, students with agricultural experiences are more adequately prepared to participate in the basic courses of agronomy than students without agricultural experiences. A number of students have demonstrated the ability necessary to be granted credit by examination if such a program were provided.[20]

A comparative study of initial achievement of agricultural college students by Thomas found that when students in the sample were divided into three basic groups that there were significant differences at the .05 level with respect to grades received in only one of the ten first year college courses. The three basic groups were (1) students not having studied high school vocational agriculture; (2) students having one or two units of high school vocational agriculture; and (3) students having three or more units of high school vocational agriculture and farm or non-farm background. In an introductory animal husbandry course the adjusted criterion means were highest for Group III, second highest for Group II and lowest for Group I. No significant differences were

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[20] John C. Beeks, "Pre-College Experiences as Preparation for College Courses in Agronomy" (unpub. Ed. D. dissertation, University of Missouri, 1964)

found between the farm or non-farm background groups.[21]

Pierce determined that students with vocational agriculture training did as well as students without vocational agriculture training in scholastic achievement at the Ohio State University.[22] Bender and Pierce also stated that there was no statistically significant difference at the .01 level of confidence between sons of farmers and of non-farmers in the mean cumulative point-hour ratio. There was no statistically significant difference at the .01 level of confidence between the mean point grades in nineteen selected subject areas completed by students with and without vocational agriculture in the College of Agriculture.

Students with vocational agriculture training were more persistent in college than were those students without vocational agriculture experiences.

It was also found that students in the upper one-third of their high school classes made a higher mean cumulative point-hour ratio in college than did those students in the middle one-third and lower one-third of their high school classes. Little or no relation existed between scholastic achievement and age when entering college or size of high school attended.[23]

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[21] James Donald Thomas, Jr., "A Comparative Study of Initial Achievement of Agricultural College Students" (unpub. Ph. D. dissertation, Purdue University, 1960)

[22] Dewey Pierce, "The Relation of Vocational Agriculture Experience to Scholastic Achievement at the Ohio State University" (unpub. Ph. D. dissertation, The Ohio State University, 1960.)

[23] Ralph E. Bender and Dewey Pierce, "College Success With and Without Vocational Agriculture in High School," The Agricultural Education Magazine, December, 1961, pp. 124-125.

Schmidt stated that it appeared that high school quality-point average was the best single predictor of achievement in the college of agriculture when achievement was considered in terms of first-quarter and final-quarter college quality-point averages. It was also determined that experiences in high school vocational agriculture had more to do with success by a student in the college of agriculture than did high school science courses.[24]

McCracken concluded that the academic ability of a student, as measured by quality-point averages obtained in high school and college, was highly associated with achievement in agronomy and to academic achievement in agronomy and to academic achievement in college. Academic ability was more highly related to success in college than the number of semesters of vocational agriculture training the student may have had in high school.

There was no instance where the number of semesters of high school vocational agriculture training correlated negatively with achievement in agronomy courses or with academic achievement in college.[25]

Smith reported that academic achievement for groups was predicted with considerable accuracy, particularly the upper one-third to two-fifths of a given group. High school rank was found to be a useful

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[24]Gerald J. Schmidt, "Relation of High School Vocational Agriculture and Science to Achievement in the College of Agriculture." (unpub. M. S. thesis, The Iowa State University of Science and Technology, 1961.)

[25]J. David McCracken, "Relation of High School Vocational Agriculture to Achievement in College Courses in Agronomy," The Agriculture Education Magazine, May, 1963, pp. 241-242.

concept for predicting success in college when applied to groups.[26]

Pumper found at the .05 level of significance the vocational agriculture student achieved at a higher level in agronomy and animal husbandry than non-vocational agricultural students; the farm students achieved at a higher level in agronomy and animal husbandry than the non-farm students.

It was concluded that vocational agriculture experiences provided adequate background training for students enrolling in the college of agriculture at the University of Wisconsin. It was further concluded that ability of the student, residence and vocational agriculture experiences were all related to the student's college success.[27]

According to Macomber, the high school student interested in going to a college of agriculture may well be counseled into taking vocational agriculture during the entire four year program. Students who studied vocational agriculture for four years during their high school career are not handicapped in their college studies.[28]

Bentley and Hemp found that the most important factor which influenced agriculture college students to choose careers in agriculture was the farm experience of the student. More freshmen than seniors were

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[26]Clodus Ray Smith and Glen Braid, "Factors Affecting Student Success in the College of Agriculture as Shown by Research," Staff Study, University of Maryland, College Park, 1960.

[27]Fred J. Pumper, "High School Background and Student Success in the College of Agriculture at the University of Wisconsin," (unpub. M. S. thesis, University of Wisconsin, 1961.)

[28]Floyd D. Macomber, "Performance Comparisons Between Vocational Agriculture Students and Non-Vocational Agriculture Students in the Four Year Program of the College of Agriculture at Cornell University," (unpub. M. Ed. thesis, Cornell University, 1961.)

influenced by their experiences in the Future Farmers of America Chapter and the study of vocations in high school.[29]

Students are also influenced by parents, teachers of agriculture, and by reading materials.[30]

According to Krebs, the college of agriculture appears to be getting a majority of its best students from among high school students who have taken two or more units of vocational agriculture. No significant relationship was found between units of credit in high school vocational agriculture and scholastic aptitude. Students with a higher number of high school credits in vocational agriculture tended to earn slightly higher average grades in college than those students with a smaller number of high school credits in vocational agriculture.[31]

American College Testing Program

The ACT test is composed of four areas: English Usage Test, Mathematics Usage Test, Social Studies Reading Test and Natural Science Reading Test.

ACT scores are reported as standard scores, national and ACT percentile equivalents. The percentile scores range from one to ninety-nine

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[29]Ralph R. Bentley and Paul D. Hemp, "Factors Influencing Agriculture College Students to Choose Agriculture as a Career," The Agriculture Education Magazine, April, 1958, pp. 222-236.

[30]Ralph R. Bentley and Paul E. Hemp, "Factors Influencing Agriculture College Students to Choose Their Fields of Specialization," The Agriculture Education Magazine, May, 1958, p. 259.

[31]Alfred H. Krebs, "College Success of Students Enrolled in the College of Agriculture, University of Illinois," Non Thesis Study, University of Illinois, Division of Agricultural Education, Urbana, 1961.

and nine tenths per cent and enables estimates to be made of how an individual or group scores in comparison to a total group.

The ACT program is designed to measure "...the ability of a student to perform those intellectual tasks he is likely to face in his college studies.[32] It is considered a good indication of scholastic aptitude for college work and provides indices of relevance to the selection of applicants. It is a prerequisite for entrance to many colleges.

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[32]American College Testing Program. ACT Scores on Your Campus (Iowa City, Iowa: American College Testing Program, Inc., 1962-63) p. 8.

CHAPTER III

METHODOLOGY

The purposes of this study were fourfold: (1) To construct a basic examination for use at Oklahoma State University and the Agricultural Colleges in Oklahoma in order to determine the proficiency of freshman agricultural students in animal science. (2) To determine the experiences that best prepare students for proficiency in animal science. (3) To make information available to the Animal Science Department of Oklahoma State University and the agricultural colleges in Oklahoma in order that they may evaluate the study to determine possibilities of sectioning students enrolled in animal science according to their abilities. (4) To serve as an instrument to assist teachers of Vocational Agriculture when counseling high school students in the area of animal science.

The population of this study consisted of all students enrolled for the first time in the schools or colleges of agriculture, in the institutions of higher education in Oklahoma for the fall semester of 1965-66. The following institutions were included: Cameron State Agricultural College, Connors State Agricultural College, Eastern Oklahoma Agricultural College, Murray State Agricultural College, Northeastern Agricultural and Mechanical College, Northern Oklahoma Junior College, Northwestern State College, Oklahoma State University and Panhandle Agriculture and Mechanical College.

A test in animal science was formulated, information was obtained in relation to the student's previous experiences, ACT percentile scores and high school grade point averages were obtained in order to accomplish the previously listed purposes.

An animal science test was formulated as a means of developing an instrument to use for determining the student's proficiency in animal science. To serve as an aid and guide in the formulation of the test, the head of the animal science department of each institution mentioned above or a designated representative was contacted by telephone followed by a letter explaining the nature of the study and what was hoped to be accomplished. An example of the letter used to contact the individuals is shown in Appendix A. A request was made for a copy of the final examination used by each institution for the beginning course in animal science. Upon receipt of the final examinations from all of the institutions, the examinations were reviewed, summarized, and a proposed animal science test was formulated to be used in measuring the proficiency in animal science for the purpose of this study.

The animal science test used in this study was first validated according to content. Also, a jury of two qaulified men reviewed the test and made suggestions for its improvement. These men were:

1. Dr. Robert Noble, Associate Professor, Animal Science Department, Oklahoma State University;
2. Dr. Everett Edington, Associate Professor, Agricultural Education Department, Oklahoma State University.

The original instrument was pre-tested by being administered to graduating senior students in the vocational agriculture departments of three high schools in order to determine the understandability of the

questions, the length of time necessary to administer the test and to reveal any weaknesses in the instrument.

The three high school vocational agriculture departments randomly selected to administer the pre-tests were located at Wakita, Oklahoma, in the Northwest District: Broken Arrow, Oklahoma, in the Northeast District; and Stigler, Oklahoma, in the Southeast District. The teacher in charge of each of the three departments was first contacted by telephone and a letter of instruction for administering the test followed. Also, a request was made by the writer to be notified of any change the teacher felt would improve the test. The letter and opinion sheet are shown in Appendix B and C respectively. The tests were administered during the latter part of the spring semester of the 1964-65 school year.

Upon review of the opinion sheets and comparison of the questions considered difficult to understand, it was found that no two schools had indicated that the same questions were not clear and understandable. Therefore, the test questions were not altered and were used in the same form for the final instrument.

The average length of time necessary for the senior high school students to complete the test was fifty minutes and this was considered a satisfactory schedule.

A member of the agricultural staff of institutions of higher learning participating in the study was contacted by telephone during August of 1965 to secure assistance and cooperation in administering the test. The nature and extent of the study was explained as well as the purposes of the study. Instructions for administering the test were given during the telephone conversation and the written instructions which were mailed to each staff member cooperating in the study are included as Appendix D.

The tests were administered by the cooperating staff members.

Due to administrative policy of various institutions, some of the animal science tests were administered during the orientation period while other institutions administered the test during a certain class period. All tests were administered and returned within three weeks after the beginning of school for the fall semester of 1965-66. The final instrument which was used in gathering the data is presented as Appendix E.

A personal information sheet used to obtain certain data about each student was filled out by the student at the time of taking the animal science test and is included as Appendix F.

The composite ACT percentile score and the high school grade point averages were obtained by two methods. Staff members who had administered the animal science tests secured the necessary information in those institutions prohibiting persons other than their own personnel to work with office records. The letter of instruction and the form to be completed are included in Appendix G and H respectively. The writer used the same form as indicated in Appendix H to collect the composite ACT percentile scores and the high school grade point averages in institutions where it was permissible.

Computation of the high school grade point average included only those courses which are considered to be academic or vocational in nature. Courses such as band, athletics and physical education were not considered. The scale used in computing the grade point average was four points for A's, three points for B's, two points for C's, one point for D's and no points for F's.

The following persons were instrumental in administering the

animal science test and/or assisting in obtaining the ACT scores and the high school grades:

1. Mr. Fred LeCrone, Associate Professor and Director of Student Personnel for the College of Agriculture, Oklahoma State University.
2. Mr. Glenn V. Thomas, Chairman, Agriculture Department, Cameron State Agricultural College.
3. Mr. Robert A. Hodges, Chairman, Agriculture Department, Connors State Agricultural College.
4. Mr. Forrest Hamilton, Chairman, Division of Agriculture, Eastern Oklahoma Agricultural and Mechanical College.
5. Dr. Jerry J. Martin, Chairman, Agriculture Department, Murray State Agricultural College.
6. Mr. J. C. Miller, Agriculture Department, Northeastern Oklahoma Agricultural and Mechanical College.
7. Mr. Joe Kreger, Agriculture Department, Northern Oklahoma Junior College.
8. Mr. Leo S. Brandt, Associate Professor of Agriculture, Northwestern State College.
9. Mr. Milton W. English, Professor and Head of Animal Science Department, Panhandle Agricultural and Mechanical College.

Hypotheses to be Tested

1. Regardless of agricultural experiences, a student's proficiency in animal science, as measured by a proficiency test, varies proportionately with his composite ACT percentile score and his high school grade point average.

2. First year agricultural college student scores on an animal science proficiency test increase in proportion to their farm experience and education in vocational agriculture.
3. Animal enterprises in the student's supervised farming program increases the knowledge and understanding of animal science as measured by an animal science proficiency test.

Limitations

This study was limited to the areas of determining the competencies in animal science as measured by an animal science proficiency test formulated by the writer. Also, the study was limited to the isolation of various factors which contribute to such competencies.

Further limitations are placed on the study because of being limited to the first year students enrolled in schools or colleges of agriculture in institutions of higher education in Oklahoma for the fall semester of the school year 1965-66.

Statistical Analysis

All data collected were hand graded, coded and punched on computer cards. In order to conserve time and increase accuracy, electronic computing equipment was used.

Ostle makes the following statement:

> When we possess information on two or more related variables, it is natural to seek a way of expressing the form of the functional relationship. In addition, it is desirable to know the strength of the relationship. That is, not only do we seek a mathematical function which tells us how the variables are interrelated, but also we wish to know how precisely the value of one variable can be predicted if we know the values of the associated variables. The techniques used to accomplish these two objectives are known as

> regression methods and correlation methods. Regression methods are those used to determine the 'best' functional relation among the variables, while correlation methods are used to measure the degree to which the different variables are associated.[1]

The regression coefficient of the high school grade point average and ACT scores were considered as multivariables and the ACT score as a single variable. The statistical design is a two by two factoral. Interaction effect of two levels of vocational agriculture education with two levels of farm experience was measured by use of the t test. The difference between levels of the variables were measured separately and independently by use of the t test. The analysis obtained by use of the above mentioned model are given in Appendices K, L and M.

The analysis of variance was used to analyze other variables which could contribute to the knowledge and understanding of animal science. Such variables as levels of supervised farming program of students who had received vocational agriculture education with farm experience and those without farm experience as well as those students who had not received vocational agriculture education with farm experience and those without farm experience were tested by use of the F test. The analysis obtained are given in Appendices I, J, N, O, P and Q.

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[1]Bernard Ostle, Statistics in Research (Ames, Iowa: The Iowa State University Press, 1964) p. 159.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Data presented in this chapter were secured from an animal science examination administered to all first year students enrolled in the school or college of agriculture at institutions of higher education in Oklahoma the first semester of the 1965-66 school year. Personal information concerning each student was obtained at the time of the examination. The ACT composite percentile and high school grades were obtained from the respective institutions.

The major purpose of this study was to determine if certain experiences in a student's background contribute to the knowledge and understanding of animal science as measured by an examination.

The mean high school grade point average, composite ACT percentile and animal science examination score of two levels of farm experience with two levels of vocational agriculture education are presented in Table I. Students having farm experience as well as receiving vocational agriculture education while in high school scored higher on an animal science examination than those with any other combination of farm experience and vocational education. These same students had the lowest mean composite ACT percentile score of any combination of farm experience and vocational agriculture education.

The mean high school grade point average for those students living on a farm and receiving vocational agriculture education was somewhat

higher than any other combination of farm experience and vocational agriculture education.

TABLE I

THE MEAN SCORES, HIGH SCHOOL GRADE POINT AVERAGE, COMPOSITE ACT PERCENTILE AND ANIMAL SCIENCE SCORE FOR FIVE HUNDRED THIRTY-FIVE STUDENTS BY LEVELS OF VOCATIONAL AGRICULTURE EDUCATION AND FARM EXPERIENCE

Group	Means		
	Covariable		Criterion
	Grade Point Average	ACT Score	Animal Science
No vocational agriculture education while in high school			
No farm experience	2.5582	44.8171	38.3415
Farm experience	2.7521	42.5614	41.4737
Received vocational agriculture education while in high school			
No farm experience	2.7378	32.1596	44.7766
Farm experience	2.7887	30.3444	47.4735

Farm experience and vocational agriculture education apparently resulted in an increased mean score achieved on the animal science examination. The mean score increase which might be attributed to farm experience without vocational agriculture education was 3.1322 and increase due to farm experience for those receiving vocational agriculture education was 2.6969. It seemed evident that experiences in vocational agriculture education contributed more to the mean animal science examination score than did farm experience.

Those students receiving vocational agriculture education, but not having farm experience scored 6.4351 points higher than those students receiving no vocational agriculture education and no farm experience.

Students receiving vocational agriculture education and farm experience scored 5.9998 higher than those students receiving no vocational agriculture education but received farm experience.

Students not receiving vocational agriculture while in high school and not having farm experience scored higher on the ACT composite percentile than any other combination of experiences. Students scoring the lowest on the ACT composite percentile were those receiving vocational agriculture education as well as farm experience. The entire group of students receiving vocational agriculture education had a lower mean ACT percentile score than students not receiving vocational agriculture education.

The high school grade point average was higher for students having vocational agriculture education than those not having vocational agriculture education.

It is the opinion of the writer that high schools vary considerably in the method and system of grading high school students. In many instances there was evidence that variation existed within an individual school system.

The mean of the ACT composite percentile score was lowest for students having received vocational education as well as farm experience. The mean ACT score increased 1.8152 points for those having vocational agriculture education and no farm experience over those students having both vocational agriculture education and farm experience. Students receiving no vocational agriculture education but having farm experience

scored 12.2170 points higher than those students receiving vocational agriculture education and farm experience. Students having no vocational agriculture education and no farm experience scored 12.6575 points higher than those students receiving vocational agriculture education but no farm experience.

Results obtained from the ACT composite percentiles could possibly be explained by the fact that students receiving vocational agriculture education graduated from small high schools where the curriculum offerings were limited.

The population was considered as four treatment groups. Treatment Group I included those students with no vocational agriculture education while in high school and no farm experience. Treatment Group II consisted of students having received no vocational agriculture education, but received farm experience. Treatment Group III received vocational agriculture education, but no farm experience. Treatment Group IV received vocational agriculture education and farm experience.

The unadjusted animal science mean score for each treatment group adjusted to the mean of the ACT score gave a positive adjusted animal science mean score as indicated in Figure 1.

Table II pertains to the actual and adjusted mean score on animal science examination affected by two levels of vocational agriculture education and farm experience for five hundred thirty-five students. Seventy students were not included in the animal science adjusted mean scores because of missing data concerning high school grade point average and/or ACT composite percentile.

The largest group of students, three hundred two, participated in both vocational agriculture education and farm experience and scored

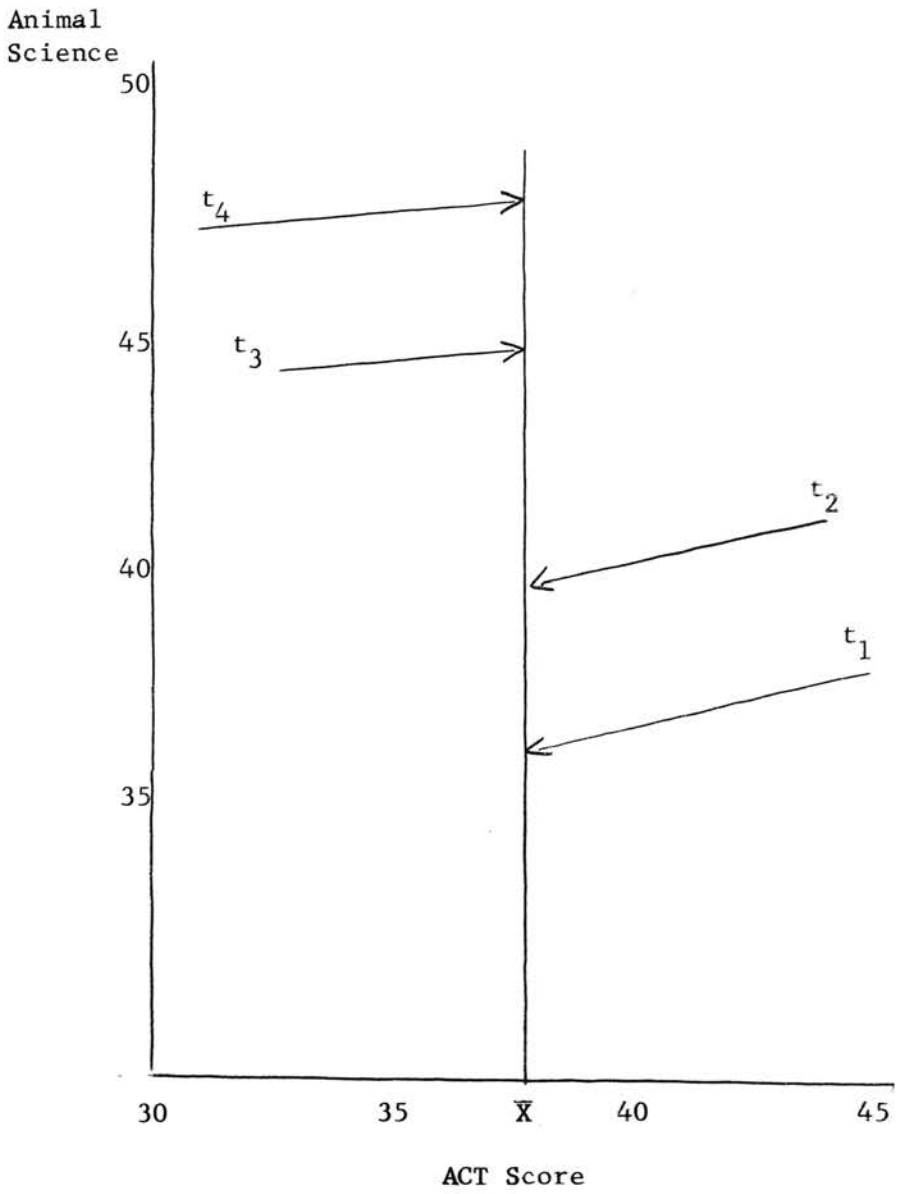

Figure 1. Effect of ACT Test Scores on Unadjusted Animal Science Scores by Treatment Levels.

higher on the animal science examination than any other combination of vocational agriculture education and farm experience. Their adjusted mean score was 48.0366 as compared to 36.7817 for students without vocational agriculture education and farm experience.

TABLE II

THE ACTUAL AND ADJUSTED MEAN SCORE ON ANIMAL SCIENCE EXAMINATION AFFECTED BY TWO LEVELS OF VOCATIONAL AGRICULTURE EDUCATION AND FARM EXPERIENCE FOR FIVE HUNDRED THIRTY-FIVE STUDENTS

Group	Number	Animal Science Mean Scores	
		Actual	Adjusted
No vocational agriculture education while in high school			
No farm experience	82	38.3415	36.7817
Farm experience	57	41.4737	40.2448
Received vocational agriculture education while in high school			
No farm experience	94	44.7766	45.0734
Farm experience	302	47.4735	48.0366

Students receiving vocational agriculture education, three hundred ninety-six, scored higher on the animal science examination than did their counterpart not receiving vocational agriculture education. The adjusted mean score for farm experience was 40.2448 while the adjusted mean score due to vocational agriculture education was 45.0734. Vocational agriculture education contributed 4.7286 points higher than did farm experience.

An illustration of slopes of ACT scores on animal science scores

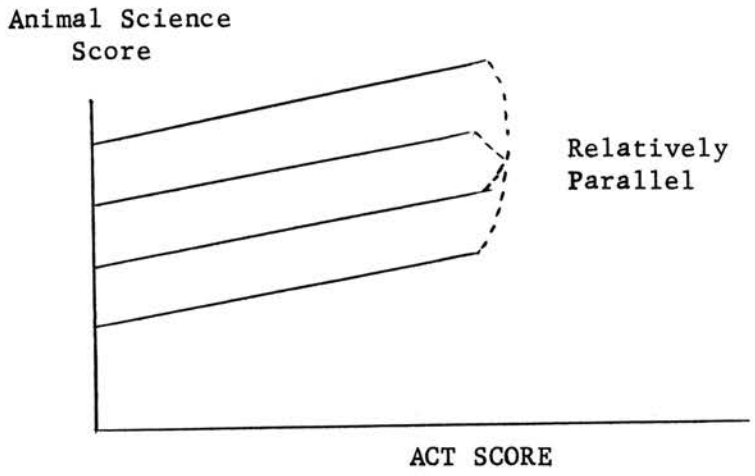

Figure 2. Slopes of ACT Scores on Animal Science Scores by Types of Treatment

are shown by types of treatment in Figure 2. The slopes for each treatment group are about equal. By use of the regression lines of each group, the adjusted animal science mean score was obtained. The adjusted animal science mean score was adjusted to the mean of all ACT percentile scores combined.

To measure the effect of high school grade point average and ACT composite percentile score, the regression coefficients were used. The regression coefficients are shown in Table III. In the computation the formula $\hat{Y} = a + \sum_{j=1}^{2} b_j X_j$ was used for the regression equation. $\hat{Y}$ is the predicted value of the animal science test score, with X_1 the known value of the ACT composite percentile score and X_2 the known value of high school grade point average. The regression coefficients are for each respective treatment group.

The regression coefficient of treatment group I indicates that as the grade point average increases by one point the animal science score decreased .4690 of a point. When the ACT composite score is considered

in combination with the grade point average, the animal science score increased .1543 of a point when the ACT composite score increased one point. As the ACT composite score is used alone the animal science score increased .1481 of a point for each one point increase in ACT composite percentile score.

TABLE III

REGRESSION COEFFICIENTS OF GRADE POINT AVERAGE AND ACT SCORE CONTRASTED WITH REGRESSION COEFFICIENTS OF THE ACT SCORE AS A SINGLE VARIABLE BY LEVELS OF VOCATIONAL AGRICULTURE EDUCATION AND FARM EXPERIENCE

Group	No.	Used in Combination: Grade Point Average	Used in Combination: ACT Score	Used alone: ACT Score
No vocational agriculture education while in high school				
1. No farm experience	82	-0.4690 (t=-0.2089)	0.1543 (t=2.9029)	0.1481 (t=3.3787)
2. Farm experience	57	-0.0382 (t=-0.0128)	0.1403 (t=2.1546)	0.1400 (t-2.4219)
Received vocational agriculture education while in high school				
3. No farm experience	94	4.0497 (t=1.7698)	0.1279 (t=2.1693)	0.1847 (t=3.6977)
4. Farm experience	302	0.9261 (t=.8301)	0.1251 (t=4.5365)	0.1375 (t-5.9460)
Common Beta's		1.1347	0.1319	0.1467

Common Beta values were computed in order to establish common values when considering grade point average and ACT composite percentile scores. The model for calculating the Common Beta values was the same as for the regression equation. All observations were used in this model.

Analysis of variance was used to determine the level of

significance between the observations measured separately and measured as a common effect. As indicated in Appendix I it was found that there was no significant difference at the .05 level between separate effect and common effect.

The t values in Table III indicate that grade point average as a covariable is not significantly different from zero at the .025 level. However, the ACT composite percentile score as a covariable is significant at the .025 level. Also, the t values of the ACT scores indicate homogenity of treatment groups.

Since the slopes of the ACT percentile score on animal science test scores of the four treatment groups are relatively equal as illustrated in Figure 2, the effect of the ACT score upon the treatment groups are relatively homogeneous. The data were treated as combined groups and the Common Beta value, 0.1467, for the ACT score was used.

To test the significance of the grade point and ACT coefficients, analysis of variance was used. As indicated in Appendix J there was a significant difference at the .05 level due to combined grade point and ACT coefficients. However when the effect of ACT was subtracted from the effect of grade point and ACT combination there was no significant difference at the .05 level.

The effect of vocational agriculture education upon the animal science scores is illustrated in Table IV. Students receiving vocational agriculture education scored higher in both categories of farm experience than did those students not receiving vocational agriculture education. Students receiving vocational agriculture education with farm experience scored 7.7918 points higher than those students without

vocational agriculture and farm experience. Students with vocational agriculture education and non-farm experience scored 8.2917 points higher than students without vocational agriculture education and no farm experience. Animal science grand mean score for students receiving vocational agriculture education was 8.0417 points higher than for students not receiving vocational agriculture education.

TABLE IV

EFFECT OF VOCATIONAL AGRICULTURE EDUCATION UPON ANIMAL SCIENCE SCORES

Group	Adjusted Means		Grand Mean
	Farm	Non-Farm	
Received vocational agriculture education while in high school	48.0366	45.0734	46.55500
Did not receive vocational agriculture education while in high school	40.2448	36.7817	38.51325

Examination of Table V shows the effect of farm experience upon the animal science examination score. Students with farm experience and

TABLE V

EFFECT OF FARM EXPERIENCE UPON ANIMAL SCIENCE SCORE

Group	Adjusted Means		Grand Mean
	Vocational Agriculture	Non-Vocational Agriculture	
Farm experience	48.0366	40.2448	44.14070
No farm experience	45.0734	36.7817	40.92755

vocational agriculture education scored 2.9632 points higher than those students with no farm experience but receiving vocational agriculture education. Students with farm experience and no vocational agriculture education scored 3.4631 points higher than did those students who did not have farm experience backgrounds or vocational agriculture education. The animal science score grand mean for students having farm experience was 3.21315 points higher than for students not having farm experience.

As indicated by the adjusted mean scores of the instrument administered, vocational agriculture education contributed more to the understanding of animal science than having farm experience. Farm experience contributes to the understanding of animal science but at a lesser degree. Each experience contributes to the knowledge of animal acience, but each contributes independently and separately from the other.

The interaction between the two major variables of farm experience and agriculture education was tested by the use of the t test. Table VI shows the divergence between the difference in the adjusted mean score due to vocational agriculture education and the divergence between the difference in the adjusted mean score due to farm experience was equal. The adjusted mean scores due to vocational agriculture were considerably higher than the adjusted mean score due to farm experience.

Interaction effect of two levels of vocational agriculture with two levels of farm experience was not significant at the .05 level; $t = 0.2253 < 1.960$. The analysis is in Appendix K.

Each variable considered separately and independently did have a significant effect upon the criterion measure. Vocational agriculture education was significant at the .05 level: $t = 7.1052 > 1.960$. Farm

experience also was significant at the .05 level: $t = 2.8965 > 1.960$. The analyses are in Appendices L and M respectively.

TABLE VI

INTERACTION EFFECT OF TWO LEVELS OF VOCATIONAL AGRICULTURE WITH TWO LEVELS OF FARM EXPERIENCES IN MEAN DIFFERENCES ON ANIMAL SCIENCE EXAMINATION

Group	Adjusted Means		Difference
	Farm	Non-Farm	
Received vocational agriculture education while in high school	48.0366	45.0734	2.9632
Did not receive vocational agriculture education while in high school	40.2448	36.7817	3.4631
Difference in adjusted mean score	7.7918	8.2917	.4999

The probability of mean differences of main effects and interaction of vocational agriculture and farm experience is shown in Table VII.

TABLE VII

PROBABILITY OF MEAN DIFFERENCES OF MAIN EFFECTS AND INTERACTION BEING DUE TO CHANGE

Source	Actual Differences Between Levels on the Animal Science Test	t Value	Probability
Vocational agriculture education	8.04175	7.1052	.001
Farm experience	3.21315	2.8965	.014
Interaction	.4999	.2253	.814

The t value for the difference between levels on the animal science test due to vocational agriculture education was 7.1052, which has a probability of .001. The t value for the difference between levels on the animal science test due to farm experience was 2.8965, which has a probability of .014. The interaction between vocational agriculture education and farm experience has a t value of .2253, which has a probability level of .814.

Observation of Table VIII indicates that students in vocational agriculture education generally live on farms and also have work experience.

TABLE VIII

EFFECT OF WORK EXPERIENCE UPON UNADJUSTED MEAN SCORE ON ANIMAL SCIENCE EXAMINATION FOR VOCATIONAL AGRICULTURE STUDENTS

Group	Unadjusted Mean Score			
	Work Experience		Non-Work Experience	
	No.	Score	No.	Score
Farm experience	265	47.5208	37	47.1351
Non-farm experience	86	45.0581	8	41.7500

Work experience affected the unadjusted mean score of animal science for vocational agriculture students very little for students having farm experience. Work experience for those students not having farm experience was of more importance in obtaining knowledge concerning animal science. However, all students did not necessarily receive work experience in the area of animal science.

The unadjusted mean score for students not living on a farm within

the past five years but having work experience scored 3.3081 points higher than those not living on a farm within the past five years and not having work experience.

The small number in three of the cells prevented any statistical test of difference.

Table IX includes all students receiving vocational agriculture education. It was possible for students to indicate that they had received more than one type of work experience but there was no evidence as to the extent of time and actual training obtained by the work experiences in which they participated.

TABLE IX

PROPORTION OF VOCATIONAL AGRICULTURE STUDENTS BY KIND OF FARM RESIDENCE AND KIND OF WORK EXPERIENCE

Work Experience	Farm Experience	Non-Farm Experience
	N = 331	N = 107
Livestock Farm	.4169	.4205
General Farm	.6676	.6635
Crop Farm	.5015	.4300
Sale Barn	.2386	.2336
Stockyard	.0936	.0654
Feed Store	.1389	.1215
Supply Center	.0272	.0747
Veterinarian	.1329	.1401
Others	.1631	.1869
None	.1209	.0934

The proportion of students participating in various work experiences was similar regardless of farm experience background. In each group the highest proportion had general farm work experience followed by crop farm experience and livestock farm experience. The lowest proportion was work experience in a supply center.

Veterinarian work experience was indicated by more respondents than was anticipated. It is possible that some students interpreted this to be any veterinarian type work done regardless of the level of supervision and not as an assistant or aid to a graduate veterinarian.

The effect of different levels of supervised farming program upon the mean animal science score of students with vocational agriculture education but no farm experience is indicated in Table X.

TABLE X

EFFECT OF DIFFERENT LEVELS OF SUPERVISED FARMING PROGRAM UPON THE MEAN SCORE OF NINETY-FOUR STUDENTS WITH VOCATIONAL AGRICULTURE EDUCATION BUT WHO HAVE NOT HAD FARM EXPERIENCE

Level of Supervised Farming Program	Mean Score		
	No.	Actual	Adjusted[a]
None or crop projects only	12	36.9	38.2
One animal science project	33	43.7	44.0
One animal science + crop projects	6	48.3	49.7
Two animal science projects	25	48.3	46.9
Two animal science + crop projects	6	45.5	45.2
Three animal science projects	12	46.1	46.4

[a] $F\ (5,87) = 1.25 < 2.29$ Not significant at the .05 level

The highest adjusted mean score was for the student who had one animal science project plus crop projects.

The adjusted mean score for students with no projects or crop projects only, indicates that their knowledge of animal science is derived more from the project program of vocational agriculture and of supervised individual study than from the total vocational agriculture program.

Analysis in Appendix N indicate that the adjusted mean scores are not significant at the .05 level.

A supervised farming program contributed to the knowledge of science of the three hundred two students receiving vocational education and farm experience as indicated in Table XI. Students having no

TABLE XI

EFFECT OF DIFFERENT LEVELS OF SUPERVISED FARMING PROGRAM UPON MEAN SCORE OF THREE HUNDRED TWO STUDENTS WITH VOCATIONAL AGRICULTURE EDUCATION AND FARM EXPERIENCE

Level of Supervised Farming Programs	Animal Science Mean Score		
	No.	Actual	Adjusted[a]
None or crop projects only	16	43.0	44.1
One animal science project	52	45.3	45.6
One animal science + crop projects	40	48.8	48.6
Two animal science projects	68	45.4	45.7
Two animal science + crop projects	49	48.5	47.9
Three animal science projects	77	50.3	50.1

[a] $F\ (5,295) = 2.345 > 2.21$ Significant at the .05 level

projects or having only crop projects had the lowest mean score of any group. Those with one animal science project plus crop projects scored higher than any combination of projects except students with three animal science projects. The previous table indicated that students receiving vocational agriculture education with no farm experience who had one animal science project plus crop projects made the highest mean score. Students receiving vocational agriculture education with farm experience having one animal science project plus crop projects scored higher than any other group except those having three animal science projects.

The supervised farming program which includes animal science projects adds to the knowledge and understanding of animal science. The information obtained through supervised study pertaining to the supervised farming program contributes to knowledge gained by the students. The supervised farming program as part of the total programs of vocational agriculture in Oklahoma is a vital phase of the learning experience for students.

Analysis of effect of different levels of supervised farm program upon the mean score for students with vocational agriculture education and farm experience as indicated in Appendix O is significant at .05 level.

Due to the limited number of students in the various levels of supervised farming program for students with farm experience but without vocational agriculture education, the levels of supervised farming program were classified into no projects or crop projects only and one to three animal science projects with or without crop projects as indicated in Table XII.

TABLE XII

MEAN SCORES OF STUDENTS WITH FARM EXPERIENCE WITHIN THE PAST FIVE YEARS BUT WITHOUT VOCATIONAL AGRICULTURE EDUCATION

Level of Supervised Farming Program	Animal Science Mean Score		
	No.	Actual	Adjusted[a]
None or crop projects only	35	39.9	39.6
One to three animal science projects with or without crop projects	22	43.9	44.4

[a] $F(1,54) = 2.109 < 4.00$ Not significant at the .05 level

The responsibility and duties required in the supervision of an animal science enterprise contributes to the increased knowledge in animal science. Students who participated in animal science projects had a higher adjusted animal science mean score, but it was not significant at .05 level as indicated in the analysis in Appendix P.

The adjusted mean score for students who did not have farm experience or vocational agriculture education as shown in Table XIII

TABLE XIII

MEAN SCORES OF STUDENTS WITHOUT FARM EXPERIENCE WITHIN THE PAST FIVE YEARS AND WITHOUT VOCATIONAL AGRICULTURE EDUCATION

Level of Supervised Farming Program	Animal Science Mean Score		
	No.	Actual	Adjusted[a]
None or crop projects only	77	38.6	38.5
One to three animal science projects with or without crop projects	5	34.0	36.0

[a] $F(1,79) = 0.245 < 3.92$ Not significant at the .05 level

indicates that the student's knowledge of animal science was limited. A majority of the seventy-seven students with no projects or crop projects only could be classified in the category of no projects and the number of students with one to three animal science projects with or without crop projects was limited because of the nature of the population used in the study.

It is the opinion of the writer that those students without farm experience and without vocational agriculture education who had some level of supervised farming program were students that were either members of the 4-H clubs or individuals that were motivated by other interests.

Analysis in Appendix Q indicates that the scores are not significant at the .05 level.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Purpose of the Study

The main purpose of this study was to determine whether or not certain experiences in a student's background contribute to the knowledge and understanding of animal science when measured by a written examination designed to broadly cover major concepts in animal science. An additional twofold purpose of the study was (1) to make information available to the Animal Science Department of Oklahoma State University and the agricultural colleges of Oklahoma in order that they might consider the possibility of sectioning students enrolled in animal science according to demonstrated knowledge and ability and (2) to provide an instrument useful to teachers of vocational agriculture in counseling high school students and in appraising their understanding and knowledge in the area of animal science.

Methodology of the Study

A two-by-two factoral design was implemented. Students were classified into two categories: (1) those having completed one or more years of study in vocational agriculture and (2) those students receiving no vocational agriculture education. All students were further classified into groups: (1) those students having lived on a farm within the past

five years and (2) those students not living on a farm within the past five years. The combination of these two sets of classifications make up four treatment categories. Six hundred and five freshmen students enrolled in Oklahoma institutions of higher education offering substantial work in agriculture participated in the study.

A test was developed for the purpose of measuring the knowledge and understanding of animal science possessed by these first year agricultural students. The instrument was composed of selected items from tests used in animal science courses at the Oklahoma institutions of higher education. The test was reviewed and approved by a jury of experts within the field. The instrument was administered by staff members of the respective institutions. In addition to taking the test, respondents completed a questionnaire designed to secure personal information.

High school grades and composite ACT percentiles were obtained from staff members of the institutions. The high school grade point average was computed.

Summary of the Findings

It was found that students' scores on the animal science test were in inverse relationship to their ACT percentile score. Those students scoring the highest on the animal science test were students having the lowest ACT percentile score. The groups of students who had the second and third highest animal science score were students who had the third and second highest ACT percentile score respectively. The two groups of students having the lowest ACT percentile score were students receiving vocational agriculture education. Most of these students

graduated from relatively small high schools. The limited educational experiences available in those schools may have contributed to a low ACT composite percentile score.

First year agricultural college students' scores on an animal science proficiency test increased in proportion to farm experience and education in vocational agriculture. The interaction effect of two levels of vocational agriculture education with two levels of farm experience was not significant. However, when vocational agriculture education and farm experience were considered separately, each was significant. The difference in animal science scores between students having had agriculture education and students not having had vocational agriculture education was 8.04 points. The difference in the animal science scores between students with farm experience and students without farm experience was 3.21 points.

The proportion of students participating in various work experiences was similar regardless of farm experience background. The animal science adjusted mean score increased as the animal science projects increased within the student's supervised farming program. For those students with vocational agriculture education and farm experience, the supervised farming program significantly increased their knowledge and understanding of animal science. The supervised farming program had no significant effect on animal science knowledge of the other categories of students.

The first hypothesis was the following: regardless of agricultural experiences, a student's proficiency in animal science, as measured by a proficiency test, varies proportionately with his composite ACT percentile score and his high school grade point average.

The two covariates, high school grade point average and ACT percentile score, together accounted for a significant amount of variation in animal science knowledge as measured by the animal science proficiency test. There was considerable variation in the high school grade point coefficients. Because of the heterogeneous effect of the grade point average variable on the treatment categories, it was decided not to use it in combination with the ACT score as a covariable. The ACT score explained almost as much variation when used by itself as a control variable in the analysis. There was no significant difference in the amount of variation explained by the ACT score alone when compared to its use in combination with the high school grade point average. The effect of the ACT score upon the treatment groups was relatively equal. Therefore, the common Beta value as a single variable was used. The null form of this hypothesis was rejected.

The second hypothesis was the following: first year agricultural college students' scores on an animal science proficiency test increased in proportion to farm experience and education in vocational agriculture. The difference in the animal science adjusted mean score because of the effect of vocational agriculture education was 8.04 points. The difference in the animal science adjusted mean score because of the effect of farm experience was 3.21 points. Each experience contributed to the knowledge and understanding of animal science but each contributed independently and separately from the other. According to the t test, both the vocational agriculture education and the farm experience was significant. The null form of this hypothesis was rejected.

The third hypothesis was that animal enterprises in a student's supervised farming increase the knowledge and understanding of animal

science was significantly increased by levels of the supervised farming program for those students receiving vocational agriculture education and having farm experience.

The null form of the hypothesis was rejected for students receiving vocational agriculture education and farm experience. However, the supervised farming program had no significant effect on animal science knowledge for all other students.

Conclusions

This study was undertaken to determine previous experience of students which may contribute to the knowledge and understanding of animal science as measured by an examination. The findings indicate that high school grade point average and ACT composite percentile score were indicators of higher scores on an animal science test.

Vocational agriculture education and farm experience contribute independently and separately to the student's knowledge and understanding of animal science. The understanding and knowledge of animal science were increased when animal science projects were included in the supervised farming program of students receiving vocational agriculture education and farm experience. The scope of animal science enterprises in the supervised farming program had no effect upon the knowledge and understanding of animal science.

Implications

This study determined that it was possible to isolate factors which contribute to the student's knowledge and understanding of animal science. Those students having farm experience, vocational agriculture

education while in high school, and some combination of animal science projects in their supervised farming program have more knowledge and understanding of animal science than any other combination of experiences investigated. Findings of this research would imply support for the conclusion that granting credit in a basic animal science course to entering students performing satisfactorily on an examination should be permitted for those students presenting evidence of having had the previously mentioned combination of experiences. Students without such a combination of experience would, of course, benefit by being sectioned into classes where the more basic understandings and principles of animal science received emphasis.

Additional investigation may be desirable which would contribute to farther statistical validation of the instrument used in this study. The review of literature also indicated a lack of investigation directed toward determining factors which might contribute to knowledge and basic understandings in horticulture, agricultural mechanics, poultry and dairy science as possessed by entering college students in Colleges or Schools of Agriculture.

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APPENDIX A

Coweta, Oklahoma
April 4, 1965

Dear Sir:

In isolating a topic for research and for writing a dissertation, I have chosen to formulate a test in Animal Science to determine the level of knowledge of first year agricultural students at Oklahoma State University and the colleges in Oklahoma offering Agriculture. Also, the factors that contribute to success or failure on the test will be correlated.

To be able to do this I need a copy of the final examination given at your institution to students enrolled in the first two courses of Animal Science. The examination will be kept confidential.

A summary of information will be sent to you upon completion of the dissertation with the hope that it will be of value to you in working with students at your institution. Your cooperation will be greatly appreciated.

Sincerely,

John C. Bruton

APPENDIX B

Coweta, Oklahoma
May 5, 1965

Dear Sir:

I am attempting to formulate a test in Animal Science to be administered to the Freshmen in the Schools of Agriculture at the colleges next year. The purpose of giving this test now is to determine the amount of time that is required to take the test and to determine if students understand the questions.

There will be no comparison of schools or of students, therefore it will not be necessary for the students to identify their paper unless it would be for your own information. When the papers are scored, I will be glad to send you your scores if you want them kept separately.

When you have completed giving the tests to the Senior Vocational Agriculture students in your department, please mail them to me at Coweta, Oklahoma.

John C. Bruton
Box 293
Coweta, Oklahoma

APPENDIX C

PLEASE FILL OUT THE FOLLOWING AND RETURN WITH THE TESTS.

1. Length of time used for the test. _____

2. The number of each question not clear to the students.

_____

_____

_____

3. Suggested improvements in the test.

_____

_____

_____

APPENDIX D

Muskogee, Oklahoma
September 5, 1966

Dear Sir:

The enclosed materials are the examinations that I spoke to you about on the phone the other day which are to be administered to beginning first year agriculture students.

When the materials were stapled together, the Information Sheet was placed last. If this could be filled out first, it would be more satisfactory. The allotted time should not exceed fifty minutes for the Information Sheet and for the Test. It may be that some do not finish the test in the allotted time, but it is preferred to give each person an equal amount of time in order to achieve a more accurate measure of scores.

It would be most satisfactory if the examination could be given within the first two weeks after classwork begins.

The enclosed stamps will be enough to return the tests by first-class mail. If you have additional expenses in connection with administering the tests, please let me know and I will be glad to reimburse you.

Thank you for your assistance and cooperation. I certainly appreciate it.

Sincerely,

John C. Bruton

APPENDIX E

A. Multiple Choice - place correct letter or letters in the blank left of the numbers.

_____ 1. The number of beef cattle per capita in the U. S. in 1964 has (a) decreased (b) stayed about the same (c) increased as compared to 1950.

_____ 2. The average percentage calf crop in the U. S. is about (a) 65-70% (b) 82-87% (c) 90-95%.

_____ 3. The per capita consumption of beef in the U. S. in 1964 was approximately (a) 85 (b) 90 (c) 95 (d) 100 (e) 105 lbs.

_____ 4. The three leading states in the number of beef cows 2 yr. and older are (a) Kansas (b) Missouri (c) Texas (d) Nebraska (e) South Dakota (f) Oklahoma.

_____ 5. The most important system of beef cattle production in Oklahoma is (a) purebred livestock production (b) stocker operation (c) stocker and feeder cattle production (cow and calf operation) (d) fattening cattle (e) baby beef production.

_____ 6. A breed of beef cattle that originated in France is (a) Charbray (b) Shorthorn (c) Angua (d) Charolais (e) Red Poll.

_____ 7. More risk is involved in a (a) stocker operation (b) cow and calf program (c) cattle feeding (d) baby beef production (e) fat calf production.

_____ 8. Breeds which originated in the British Isles are (a) Charolais (b) Angus (c) Horned Hereford (d) Beef master (e) Shorthorn.

_____ 9. A heifer calf born twin with a bull is called a Freemartin and she is (a) always sterile (b) sterile about 90% of the time (c) never sterile.

____ 10. The Santa Gertrudis was developed in (a) Texas (b) Oklahoma (c) Kansas (d) Colorado.

____ 11. The average length of pregancy with beef cows is (a) 260 days (b) 282 days (c) 295 days.

____ 12. The most important factor that determines the grade of feeder cattle is (a) conformation (b) age (c) breed (d) quality.

____ 13. The two highest priced wholesale cuts of beef carcass are (a) the round (b) rib (c) chuck (d) Olate (e) loin.

____ 14. The best indication of what is happening (expansion or contraction in the cattle business is indicated by the percentage of (a) steers (b) cows (c) heifers (d) bulls (e) stags slaughtered this year as compared to previous years.

____ 15. The principal feed used in a stocker operation is (a) roughage (b) creep feed (c) grain (d) mixed feed.

____ 16. The following steaks come from the wholesale cut, the loin: (a) blade steak (b) top round (c) T-bone (d) Porterhouse (e) club (f) arm steak (g) sirloin (h) bottom round.

____ 17. A good meaty beef carcass should have (a) 30-40% (b) 40-50% (c) 50-60% (d) 60-70% lean tissue.

____ 18. The leading area of swine production in the U. S. is (a) southwest (b) corn belt (c) southeast (d) northwest.

____ 19. The intra-mingling of fat into lean is called (a) marbling (b) muscling (c) finish (d) waste.

____ 20. The average length of gestation period of sows is (a) 190 (b) 160 (c) 132 (d) 112 days.

____ 21. Which is the largest production (a) spring pig crop (b) fall pig crop?

____ 22. A right angle spread over the top of a barrow indicates (a) desirable finish (b) lack of finish (c) too much finish.

____ 23. The price of hogs is usually lowest during what season of the year? (a) spring (b) summer (c) fall (d) winter.

____ 24. The dressed weight compared to the live weight is (a) dressing percentage (b) selling weight (c) dressed.

____ 25. The castrated male that does not show signs of sexual maturity is a (a) boar (b) stag (c) barrow (d) criptorcid.

____ 26. The one outstanding feature that distinguishes meat type swine from other swine is (a) finish (b) muscling (c) lack of finish (d) length.

____ 27. Name the breeds of swine developed in England (a) Poland China (b) Chesters (c) Berkshire (d) Duroc.

____ 28. The number of bushels of corn it takes to buy 100 pounds of live pork is (a) parity ratio (b) corn hog ratio (c) price ration (d) support prices.

____ 29. The per capita consumption of lamb in the U. S. is (a) less than 5 pounds (b) 10 pounds (c) 15 pounds (d) 65 pounds.

____ 30. At the present time total sheep number in the U. S. is about (a) 27 million (b) 35 million (c) 20 million (d) 50 million.

____ 31. Which group is the youngest slaughter lambs? (a) Spring lambs (b) Hot house lambs (c) Old crop lambs.

____ 32. In 1964 approximately (a) 10 million (b) 15 million (c) 20 million, sheep were slaughtered.

____ 33. The most important sheep country of the world is (a) U. S. (b) England (c) Australia (d) France.

____ 34. Slaughter lamb prices are usually highest during (a) spring (b) summer (c) fall (d) winter.

____ 35. Removing the tail of a lamb is (a) docking (b) castrating (cutting (c) Viscera.

____ 36. A castrated male lamb before showing signs of sexual activity is (a) stag (b) wether (c) ram (d) buck.

B. Completion: Fill in the blanks.

1. Name the five top grades of slaughter steers and heifers in order, _____, _____, _____, _____, _____.

2. Which is usually heavier, the hind quarter or the fore quarter? _____.

3. What are the 3 major factors that determine the grade of slaughter cattle? _____, _____, _____.

4. A group of steers gained 230 lbs. each in 85 days, each steer ate 1750 lbs. of feed. What was the feed conversion ratio. _____.

5. John Doe's annual cost per cow was $60. He had 100 cows and weaned 80% calf crop. If the calves weighed 400 lbs. each and sold for 21¢ per pound, how much profit or loss was there? _____.

6. A steer weighed 1050 lbs. and dressed 630 lbs. What was his dressing percentage? _____.

7. List the market classes of slaughter hogs. _____, _____, _____, _____, _____.

8. Name the 3 major systems of swine production in the U. S. _____, _____, _____.

9. Scales on the central market are checked periodically by employees of the _____.

10. Name the three major factors that affect the dressing percentage of swine. _____, _____, _____.

11. Who is the producers representative at the central market? _____.

12. Name two breeds of swine that are black with usually 6 white points. _____, _____.

13. The carcass from a US # 2, 200 lb. barrow has from _____ to _____ inches of fat back.

14. The _____ is the most important breed of sheep in the U. S.

15. The _____ is the only breed of medium wool sheep that will breed in the spring.

16. List the three major factors that determine the grade of a lamb carcass. _____, _____, _____.

17. The most valuable cut of the lamb carcass is the_____.

18. What is the major factor that determines the grade of wool? _____.

C. True or False: Place T or F in the blank to the left of each number.

_____ 1. Commission companies, as a general rule, take ownership to livestock.

_____ 2. The ownership of livestock on the central market changes hands when the buyer says "I will take them".

_____ 3. A prime chuck will normally outsell a good chuck of the same weight.

_____ 4. The most expensive or highest priced steak is usually the T-bone.

_____ 5. Most of the leading slaughter cattle markets are in the general area of the Rocky Mountain region.

_____ 6. Fill is the loss in weight during shipment.

_____ 7. Federal inspection of slaughter houses is required for all companies doing inter-state business.

_____ 8. Federal grading of beef is compulsory.

_____ 9. The average length of the estrus cycle for gilts and sows is 21 days.

_____ 10. Length is a good indication of muscling.

_____ 11. Federal inspection is compulsory for all plants.

_____ 12. The carcass from a US #3 barrow has over 1 inch of back fat.

_____ 13. Offal (in percentage) is the difference between live weight and dressing percentage.

_____ 14. The heart and lungs are vital organs contained within the first cavity of the body.

_____ 15. The extra feed and water in the digestive tract at the time of slaughter is called fill.

_____ 16. The usual breeding season for most sheep (ewes) is the last of summer and fall.

_____ 17. Spring lambs are born in the spring.

_____ 18. Federal grading of lamb carcasses is compulsory.

_____ 19. Most of the feeder lambs go to market in September and October.

_____ 20. As wool increases in length, the shrinkage usually decreases.

_____ 21. The major factor that determines the grades of wool is length.

_____ 22. Redness in bones indicates a young animal.

_____ 23. The most important factor that determines dressing percentage in slaughter lambs is finish.

APPENDIX F

PERSONAL INFORMATION

Name_____ Age_____

Year high school was completed. _____

From what high school did you graduate? _____

Name the city and county where located._____, _____

Were you enrolled in Vocational Agriculture in high school? Yes_____,

No_____.

If so, for how many years did you enroll? _____.

What major enterprises did you have in your Supervised Farming Program?

_____, _____, _____,

_____.

What was the highest total investment of any one year in your Supervised

Farming Program? _____.

Were you a member of the 4-H Club while in high school? Yes____, No____.

If so, how many years were you a member? _____.

What major enterprises did you have as 4-H projects?_____,

_____, _____, _____.

What was the highest total investment of any one year of your 4-H

project program? _____.

Have you lived on a farm in the last five years? Yes_____, No_____.

If so, what major enterprises were on the farm?_____,

_____, _____, _____

What was the average net receipts for the entire farm for the last five years? _____.

What agricultural work experience have you had other than the home farm? (Check) Work on livestock ranch _____, Work on general farm_____, Work on crop farm _____, Work at sale barn _____, Work at stock yards _____, Work at feed store _____, Work at livestock supply center _____, Work with veterinarian _____, Others (list)_____, _____, _____, _____.

APPENDIX G

Muskogee, Oklahoma
December 8, 1965

Dear Sir:

Enclosed is a list of the students from your school which participated in the test earlier this year and that we discussed by telephone.

The first column is the ACT composite percentile based on national norms for college bound students; the second column is the ACT standard score and the remaining columns are for the number of each grade which was made in academic subjects during high school. It will not be necessary to compute the grade average.

Your assistance is certainly appreciated and let me know the expense involved.

Thank you,

John C. Bruton

APPENDIX H

Student's Name	ACT Composite Percentile	ACT Standard Score	No. Grades Earned in Academic Subjects During High School				
			A's	B's	C's	D's	F's

APPENDIX I

ANALYSIS OF VARIANCE TO TEST FOR THE COMMON GRADE POINT AVERAGE AND ACT COEFFICIENTS

Source	df	SS	MS	F
Total	531	67132.2656		
Separate effect	8	7992.6355		
Common effect	2	7613.5787		
Difference	6	379.0568	63.1761	.558
Error	523	59139.6301	113.0777	

$F_{.05(6,523)} = .558 < 2.12$

APPENDIX J

ANALYSIS OF VARIANCE TO TEST FOR SIGNIFICANCE OF GRADE POINT COEFFICIENT

Source	df	SS	MS	F
Total	531	67132.2656		
Due to GP and ACT	2	7613.5787	3806.789	33.83
Due to ACT	1	7425.4902		
Difference	1	188.0885	188.0885	1.67
Error	529	59518.6865	112.5117	

$F_{.05(1,529)} = 1.67 < 3.86$

$F_{.05(2,529)} = 33.83 > 3.02$

APPENDIX K

ANALYSIS FOR THE INTERACTION EFFECT OF TWO LEVELS OF VOCATIONAL AGRICULTURE WITH TWO LEVELS OF FARM EXPERIENCE IN MEAN DIFFERENCE ON ANIMAL SCIENCE EXAMINATION

Interaction:

$$40.2448 + 45.0734 - 36.7817 - 48.0366 = 0.4999$$

$\lambda' \hat{\tau}$ = 0.4999

x = -0.4405

$\lambda' c \lambda$ = $.56 \times 10^{-6}$

$s^2 \lambda' \hat{\tau}$ = 4.9218

$s \lambda' \hat{\tau}$ = 2.2185

t = 0.4999 ÷ 2.2185

t = 0.2253

$\pm_{.05}$ = .2253 < 1.96

APPENDIX L

ANALYSIS FOR EFFECT OF VOCATIONAL AGRICULTURE EDUCATION UPON ANIMAL SCIENCE SCORES

$\frac{1}{2}(48.0366 + 45.0734 - 40.2448 - 36.7817) = 8.04175$

$\lambda' \hat{T} = 8.04175$

$(x) = -24.8745$

$4s^2\lambda'\hat{T} = (.04548126)\ (112.6543) = 5.12366$

$s^2\lambda'\hat{T} = 1.28091$

$s\,\lambda'\hat{T} = 1.1318$

$t = 8.04175 \div 1.1318$

$t = 7.1052$

$\pm_{.05} = 7.1052 > 1.96$

APPENDIX M

ANALYSIS FOR EFFECT OF FARM EXPERIENCE UPON ANIMAL SCIENCE SCORE

$\frac{1}{2}(48.0366 + 40.2448 - 45.0734 - 36.7817) = 3.21315$

$\lambda' \hat{\tau} = 3.21315$

$(x) = -4.0709$

$4s^2\lambda' \hat{\tau} = (.4369331)\ (112.6543) = 4.9222$

$s^2\lambda' \hat{\tau} = 1.23055$

$s\,\lambda' \hat{\tau} = 1.1093$

$t = 3.21315 \div 1.1093$

$t = 2.8965$

$\pm_{.05} = 2.8965 > 1.96$

APPENDIX N

ANALYSIS OF COVARIANCE TO TEST THE EFFECT OF DIFFERENT LEVELS OF SUPERVISED FARMING PROGRAM UPON THE MEAN SCORE OF NINE-FOUR STUDENTS WITH VOCATIONAL AGRICULTURE EDUCATION BUT WHO HAVE NOT HAD FARM EXPERIENCE

Source	df	yy	SS-Due	SS-About	df	MS	F
Treatment (Between)	5	1193.2285					
Error (Within)	88	12519.0801	1384.3739	11134.7062	87	127.9851	
Treatment + Error (Total)	93	13712.3086	1774.2235	11938.0851	92		
Difference for testing adjusted treatment means				803.3789	5	160.6758	1.255

$F_{.05(5,87)} = 1.255 < 2.29$

APPENDIX O

ANALYSIS OF COVARIANCE TO TEST THE EFFECT OF DIFFERENT LEVELS OF SUPERVISED FARMING PROGRAM UPON THE MEAN SCORE OF THREE HUNDRED-TWO STUDENTS WITH VOCATIONAL AGRICULTURE EDUCATION AND FARM EXPERIENCE

Source	df	yy	SS-Due	SS-About	df	MS	F
Treatment (Between)	5	1595.3125					
Error (Within)	296	32777.9844	3204.0482	29573.9360	295	100.2506	
Treatment + Error (Total)	301	34373.2969	3623.7939	30749.5029	300		
Difference for testing adjusted treatment means				1175.5669	5	235.1134	2.345

$F_{.05(5,295)} = 2.345 > 2.21$

APPENDIX P

ANALYSIS OF COVARIANCE TO TEST THE MEAN SCORES OF STUDENTS WHO HAVE HAD FARM EXPERIENCE WITHIN THE PAST FIVE YEARS BUT WITHOUT VOCATIONAL AGRICULTURE EDUCATION

Source	df	yy	SS-Due	SS-About	df	MS	F
Treatment (Between)	1	220.5127					
Error (Within)	55	8815.6982	957.2819	7858.4164	54	145.5262	
Treatment + Error (Total)	56	9036.2109	870.8169	8165.3940	55		
Difference for testing adjusted treatment means				306.9776	1	306.9776	2.109

$F_{.05(1,54)} = 2.109 < 4.00$

APPENDIX Q

ANALYSIS OF COVARIANCE TO TEST THE MEAN SCORES OF STUDENTS WHO DID NOT HAVE FARM EXPERIENCE WITHIN THE PAST FIVE YEARS AND WITHOUT VOCATIONAL AGRICULTURE EDUCATION

Source	df	yy	SS-Due	SS-About	df	MS	F
Treatment (Between)	1	100.3613					
Error (Within)	80	9910.0781	1176.8560	8733.2222	79	110.5471	
Treatment + Error (Total)	81	10010.4395	1250.0831	8760.3563	80		
Difference for testing adjusted treatment means				27.1342	1	27.1342	0.245

$F_{.05(1,79)} = 0.245 < 3.92$

VITA

JOHN C. BRUTON

Candidate for the Degree of

Doctor of Education

Thesis: THE EFFECT OF VOCATIONAL AGRICULTURE CLASS ENROLLMENT AND FARM EXPERIENCE ON ANIMAL SCIENCE KNOWLEDGE OF FIRST YEAR STUDENTS ENROLLED IN OKLAHOMA COLLEGES OF AGRICULTURE

Major Field: Agricultural Education

Biographical:

Personal Data: Born near Sasakwa, Oklahoma, March 2, 1924, the son of Charley C. and Pearl Bruton.

Education: Graduated from Sasakwa High School, Sasakwa, Oklahoma in 1942; attended Army Education Program, Electronic Trades, Warton, England, 1946; attended Murray State School of Agriculture, September, 1946 to January, 1948; received the Bachelor of Science degree with a major in Agricultural Education in May, 1949; received the Master of Science degree in May, 1956. Attended Northeastern State College, University of Tulsa and New Mexico State University; fulfilled the requirements for the Doctor of Education degree with emphasis on Agricultural Education, May, 1967. All three degrees were earned at Oklahoma State University.

Professional Experience: Served the United States Army February, 1944 to May, 1946; Vocational Agriculture Instructor at Salina High School, Salina, Oklahoma, July, 1949 to June, 1951; Vocational Agricultural Instructor at Coweta High School, Coweta, Oklahoma, July, 1951 to February, 1965; Biology Instructor in Muskogee Public Schools, Muskogee, Oklahoma, September, 1965 to February, 1966; Vocational Counselor in Muskogee Public Schools, Muskogee, Oklahoma, February, 1966 to the present time. Member of Phi Delta Kappa, Oklahoma Education Association, National Education Association, Oklahoma Vocational Association, American Vocational Association and The National Council of Local Administrators of Vocational Education and Practical Arts.