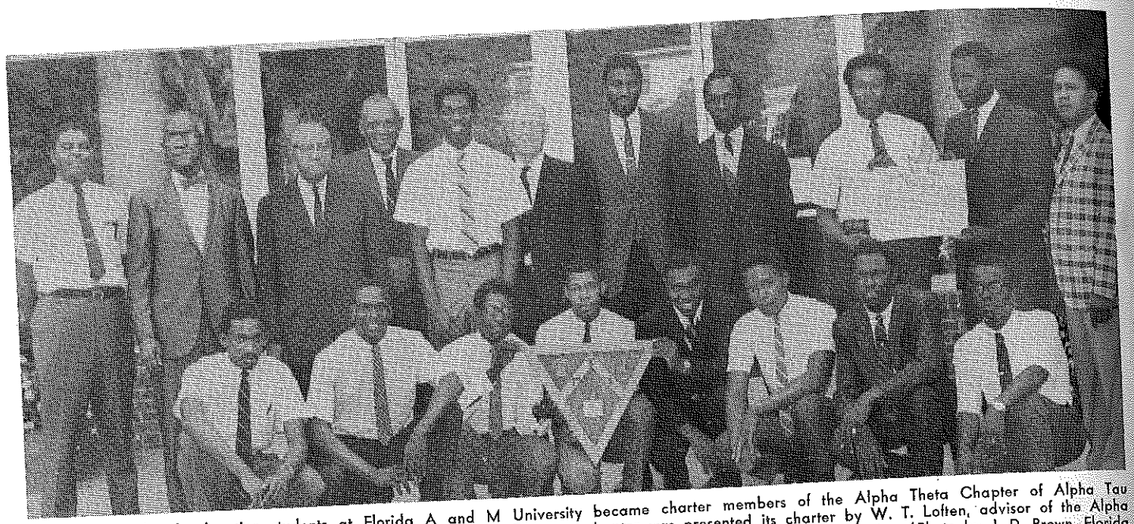
Stories in Pictures

ROBERT W. WALKER
University of Illinois



Thirteen agricultural education students at Florida A and M University became charter members of the Alpha Theta Chapter of Alpha Tau Alpha Fraternity in an initiation held on the campus recently. The new chapter was presented its charter by W. T. Loften, advisor of the Alpha Tau Alpha chapter at the University of Florida. Junious D. Brown is advisor of the Florida A and M chapter. (Photo by J. D. Brown, Florida A and M University)

Mississippi FFA chapters receive excellent cooperation from local and state newspaper editors. FFA members plan an article with Carl McIntire, Sunday Editor of the Clarion-Ledger—Jackson Daily News, Jackson, Mississippi. (Photo by Vocational-Technical Public Relations Director, Mississippi Department of Education)

AGRICULTURAL EDUCATION

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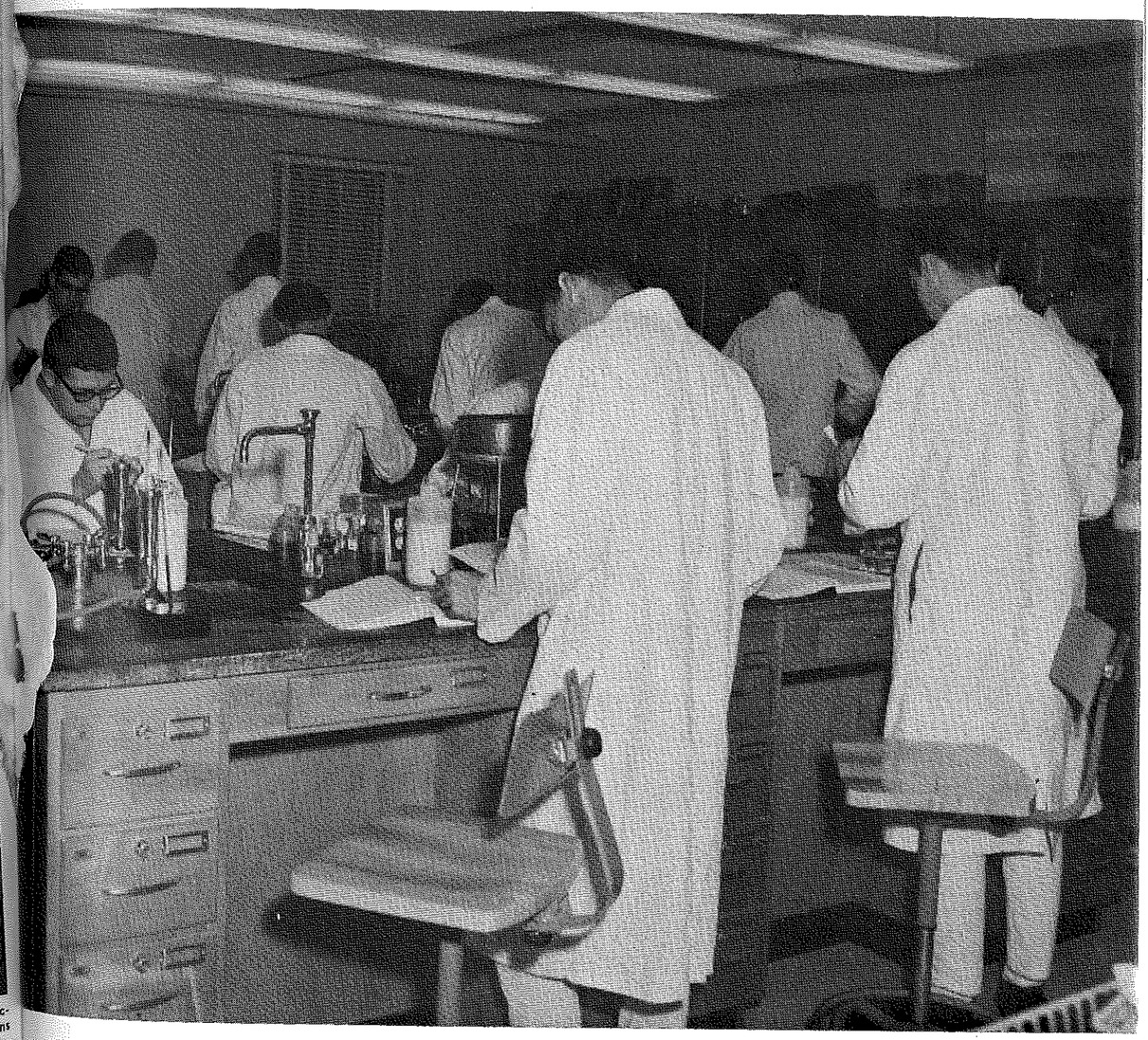
Agricultural Education



Featuring —

INSTRUCTIONAL PROGRAMS IN AGRICULTURAL PRODUCTS

THE
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EDPRESS

Editorials

From the Editor . . .

Agricultural Education in the City


J. Robert Warmbrod

Will the seventies be the decade when agricultural education becomes an important part of public education in cities and urban areas? Many agricultural educators feel that cities and urban areas offer unusual opportunities for developing and expanding appropriate programs of agricultural education. However, the prospect is not bright for other than token program development in cities, if our efforts are aimed primarily at transferring to an urban setting the program and activities of a successful, rural-oriented vocational agriculture program. Cleveland, Philadelphia, Boston, Los Angeles, and New York City provide noteworthy examples of agricultural education in large cities. But these programs, particularly their vocational aspects, serve only a minuscule percentage of all students in the school systems. Are these programs prototypes of what is possible, or for that matter, of what is needed?

In any event, the development of agricultural education programs in cities and urban areas must begin with the people and the environment in which they live. First, we need to realize that there is, and will probably continue to be in the foreseeable future, a rather sharp incongruity between agriculture and the city. Translated this means that few urban elementary and secondary students are aware of what agriculture is or the place it plays in our economy and society. Even fewer of these students consider an occupation involving knowledge and skill in agriculture a possible or suitable occupational choice or think about studying agriculture as a sensible elective. So an important task is the development of programs designed to acquaint students with the many facets of agriculture, including career exploration and orientation. Realistically this means general, practical arts, and nonvocational instruction in agriculture. We are naive to believe that city schools will offer, or that students will enroll in, a number of courses in agriculture in elementary, junior high, or senior high schools. Consequently, instruction in and about agriculture must be a part of on-

(Continued on next page)

Guest Editorial . . .

A New Goal: Providing Food for People


W. Howard Martin

Agriculture is food—and more—food comes first. Food generally receives heavy emphasis in agricultural instruction. In vocational instructional programs, traditionally, emphasis is given to food production. Food producing efficiency is a valued ability to have in a society. The world needs more of it, and agricultural education will continue to contribute to this end.

Each profession needs to give continuing attention to its goals. We in agricultural education have yet to come up with a modern-day version of "establishment in farming." These thoughts argue that "providing food for people" should become at least one goal to which our profession bears witness.

The modern world finds many groups contributing to efficiency in food production and to other functions involved in providing food for people. Indeed, vocational education in agriculture is moving toward the acceptance of the more comprehensive goal of efficiency in providing food for people.

The more comprehensive goal, as one of those which give direction in agricultural instruction, is well suited to current life conditions. Schools at different levels can plan instructional programs to contribute to this goal, whether serving an urban or rural community. Instruction for any given group can be given a desired focus ranging from production of pecans to milk distribution in ghetto areas. Yet, in each instance instructors and learners can identify with a goal of vital significance to society.

This more comprehensive goal, also, is likely to better serve the profession in communicating with legislative bodies regarding its program and needs. "Providing food for people" is a goal of broad appeal. There is much evidence that even in America, the land of agricultural surpluses, that we have much yet to do in providing food for people.

This type of goal is compatible with the new look in vocational education. The instructional concerns covering all functions call for the best possible use of talents from

(Continued on next page)

W. Howard Martin is Professor of Education, University of Connecticut, Storrs.

going and new courses in the natural and social sciences and in broadly based occupational orientation courses. Nonvocational education in agriculture will be a new venture for us, but it can be a substantial part of meaningful agricultural education in cities and urban areas.

On the other hand, we know that there are many employment opportunities in cities which require knowledge of agriculture. Most of these occupations require specialized knowledge and skill in some phase of agriculture. An appropriate strategy is to label vocational and technical programs in cities by the specialty to which they pertain—floriculture, turf management, laboratory animal technology—rather than vocational agriculture. There are unlimited opportunities in cities for secondary, post-secondary, and continuing education programs in specialized areas of agriculture. The number of persons who enroll in vocational and technical programs can be substantial, although the percentage of all secondary, post-secondary, or continuing education students studying an agricultural specialty will not be high. As we develop programs for disadvantaged persons in cities, we would be wise to realize that agriculture is probably not the most popular choice of inner-city residents as the route one takes to break the cycle of social and economic deprivation.

There are other traditions of vocational agriculture that must be altered if appropriate agricultural instruction in urban schools is to become a reality. For example, there will be a need for teachers of agriculture whose specialty is consulting with and assisting teachers of other subjects as they teach about agriculture. Most urban students wishing to explore agriculture will do just that and will not become three- or four-year "career students" as has been the case with many of the most highly successful vocational agriculture students. Vocational and technical courses in cities will of necessity be one or two years in length which is also at variance with past practice in many cases.

Provisions for laboratory and occupational experience in city and urban programs must be substantially different from what is effective in rural areas. Schools will be required to provide extensive laboratory facilities and, in many cases, provide simulated or actual occupational experience. The need for and the nature of youth organizations for urban students studying agriculture should be thoroughly investigated. I suspect that before too long we will begin to wonder why we ever thought that a youth organization which was rural both in name and outlook could be foisted on students in cities. We need to examine closely whether the arguments for a youth organization for urban boys and girls studying agriculture in the 1970's are the same or as strong as the arguments for a youth organization for rural boys studying agriculture in the 1920's.

"You can take 'vo-ag' out of the country, but you can't take the country out of 'vo-ag.'" The slogan may be trite, but it also bears an element of truth. Effective and meaningful agricultural education in the city must be different in fact, as well as name, from vocational agriculture in rural areas.—JRW

vocational educators with specialization in diverse fields.

To bear witness to the goal requires that members of the profession develop dialogue to check on the commonality of their beliefs and values in this goal. It also requires continued efforts on the part of each member to convey to clients and constituents his commitment to this program. Words alone will not suffice. Our deeds and actions must reflect a continuing concern to conduct education needed to insure efficiency in "providing food for people."

Themes for Future Issues

March	***Instructional Programs in Forestry***
April	***Instructional Programs in Agricultural Production***
May	***General and Practical Arts Education in Agriculture***
June	***Evaluation in Agricultural Education***
July	***Agricultural Education in Post-Secondary Schools***
August	***Adult Education in Agriculture***
September	***FFA: Past — Present — Future***
October	***Ideas for Effective Teaching***
November	***Research in Agricultural Education***
December	***Innovations in Agricultural Education***

THE COVER PICTURE

Students in the food processing technology curriculum at the New York State University Agricultural and Technical College at Morrisville receive a strong background in science courses related to food processing. (Photo by Glenn H. Olmstead, Agricultural and Technical College, Morrisville, New York)

Instruction for Employment in Agribusiness

ELEANOR GILMER and ELVIN WALKER
Georgia Department of Education

Recent studies of Georgia's agricultural industry reveal that agribusiness provides two-thirds of the total income in the State. Agribusiness firms comprise 66 per cent of all manufacturing firms in the State, 62 per cent of Georgia's payrolls, and 68 per cent of the expenditures for new plants and equipment.

Who is training young men and women to fill the jobs available each year in the vast agricultural industry? Some training is received on the high school level in classes of vocational agriculture, and there are those who enroll in colleges of agriculture to prepare for professional occupations in agribusiness. Vocational educators in Georgia felt a need for a program in agricultural marketing on the post-high school level.

Agricultural Marketing

In 1968 a course in agricultural marketing was added to the curriculum of the Valdosta Area Vocational Technical School near Valdosta, Georgia. The curriculum for this one- or two-year course is composed of 24 instructional units and includes business organization, math of distribution, salesmanship, credit and collection, retail store operation, human relations, accounting, communication skills, animal science, soils and fertilizers, agricultural economics, plant science, farm business management, agricultural chemicals, livestock and disease and agricultural mechanization.

Approximately half of the student's time is devoted to subjects of an agricultural nature and half to courses relating to business and marketing. The second year offers further business subjects and seminars relating to decision-making to lead to mid-management positions in sales and distribution.

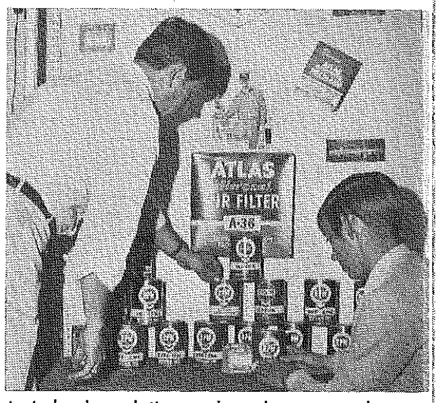
Job Opportunities

B. J. Allen, teacher of the courses, indicates that there are a number of good job opportunities available to agri-marketing students. Products of farms and ranches move to processors and through to markets. Farmers and ranchers require machinery, chemicals, fertilizers, and services. Further examples would be jobs for salesmen, store managers, agricultural field servicemen, demonstrators, mid-manager positions in food processing companies, or farm products inspectors.

Most of the students in the agricultural marketing course are from a six-county area. The education requirement for enrolling in the marketing course is that students either have a farm background or have previous agricultural courses. Students should be a high school graduate or the equivalent.

J. L. Branch, Georgia State Supervisor of Agricultural Education, anticipates that several other area vocational-technical schools in Georgia will offer the agricultural marketing course in the future.

"There is a need for more courses of this type in our post-secondary schools," Mr. Branch explained. "As farming in our State has diversified, more opportunities are available in the agribusiness industry. Georgia is a leader in poultry, peanut, pecan, forest products, and a number of allied industries. More than 70 per cent of Georgia's industrial jobs depend on farm and forest production."



Agricultural marketing students learn to make displays of products used by farmers as well as products marketed by farmers.

Eleanor Gilmer

Miss Eleanor Gilmer is Information Officer, Publications and Information Service, Georgia Department of Education, Atlanta. Elvin Walker is Assistant Supervisor of Agricultural Education, Georgia Department of Education, Tifton, Georgia.

Elvin Walker

POST-SECONDARY EDUCATION IN AGRICULTURAL MARKETING

PAUL E. CURTIS and WILLIAM J. HENEBRY
Parkland College
Champaign, Illinois

The Parkland College Agri-Marketing program is designed to prepare students to enter mid-management positions in the grain business after two years of preparation. Most of the graduates will work in local grain elevators in mid-management or management positions. Some graduates will have other interests such as grain merchandising, grain processing, or other aspects of the handling, processing or marketing of grain. The first class graduated June 1969 and are now working in various positions at salaries ranging from $7,000 to $8,500.

Instruction

The program of instruction includes courses in agricultural economics, agricultural marketing, agronomy, feeds and nutrition, soils, salesmanship and principles of agricultural business management during the freshman year. During the first year students also take courses from other areas of the college in modern business mathematics, accounting and bookkeeping, and communications skills. During the sophomore year general training is provided in the social sciences and business communications areas. Specialized courses are provided in the proper use and understanding of agriculture credit, grain futures as a hedging tool, grain grading, and the principles of grain drying, handling and storage.

One course that is popular with the students and encourages competition among members of the class is agricultural marketing problems. This course makes use of the College's IBM 360 computer and the Purdue Farm Supply Business Management Games. The students feel that these games help them to apply all of the principles of economics, marketing, business management, mathematics, and accounting they have previously studied.

Students are divided into teams which include a general manager, a feed manager, and other management positions. Each team makes decisions as to the number of tons of bulk or bag feed and fertilizer they wish to sell and at what price. Complementary decisions must also be made concerning labor, transportation, storage space, credit, and money for investment.

All of these decisions and others are then fed into the computer and the results are printed out for all teams. If a team over-expands in any area, it is hurt financially; if it doesn't have enough labor or facilities, it is charged overtime labor and a high rental figure for facilities; if its prices are too high or its credit policy too strict, sales are reduced. The goal is to be the team with the highest net worth. The real reward, however, is understanding practical applications of sound business management principles.

Laboratory Experience

A significant part of many of the courses is the laboratory. Freshmen are kept in the classroom for training. During the sophomore year many field trips are taken to local grain elevators, grain terminals, grain inspection centers, grain buying offices, the Chicago Board of Trade, the Chicago Mercantile Exchange, and equipment designers and manufacturers. Students also attend various conferences such as the Agricultural Industries Forum and the Corn Conditioning Conference as well as the annual meetings of the Illinois Grain and Feed Industry Association and the Farmers Grain Dealers Association.

Employment Experience

The real test of a student's capabilities comes when he is placed in a grain elevator during the spring quarter of the sophomore year for actual on-the-job experience. Students work in all phases of the grain elevator business—from the dump pit to the Texas house and from grain sampling to bookkeeping.

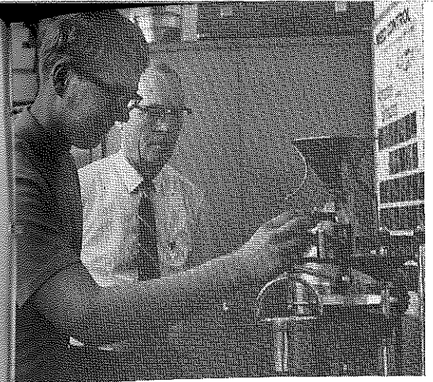
While they are on-the-job, a bi-weekly visit is made by the college supervisor who counsels with the student and the supervisor, usually the grain elevator manager, and evaluates the student's progress. On alternate weeks when the supervisor is not making visits, students return to the College one evening a week for a seminar in which all students participate in a discussion of mutual impressions and problem-solving.

At the end of the on-the-job training period several evaluations are made. The college supervisor gives the student his evaluation of the student's performance; the student evaluates the training station and the entire agri-marketing program suggesting ways that it can be improved; and the on-the-job supervisor evaluates the student and the College program. In several instances, students have remained with the business as a permanent employee. The program of study is now completed, so students are eligible for permanent, full-time employment.

Paul E. Curtis

Paul Curtis is Lead Instructor in Agriculture and William Henebry is Instructor in Agri-Marketing at Parkland College, Champaign, Illinois. Dr. Curtis holds a Ph.D. in agronomy from the University of Illinois where he conducted research and taught plant breeding and plant physiology. Mr. Henebry, with 23 years of experience as a grain elevator manager, teaches specialized grain marketing courses.

William J. Henebry



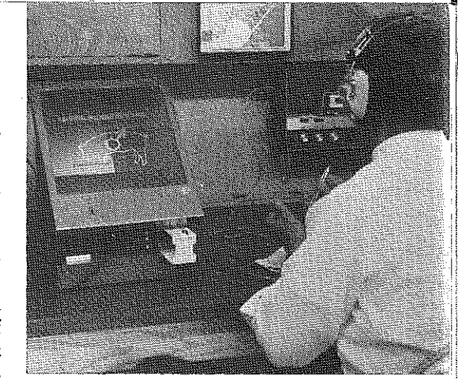
Students in the Agri-Marketing program at Parkland College study grain grading under the supervision of the instructor.

Advisory Committee

An agribusiness advisory committee is often consulted regarding the agri-marketing program as well as an agri-supply program designed to prepare for employment in the fertilizer or agri-chemical industry. Advisory committee members represent various levels of management and areas of interest including grain elevator managers, grain buyers, district and state representatives of grain and agri-chemical companies, and a grain marketing specialist from the University of Illinois.

One highlight of the 1969 program was a presentation by each member of the graduating class on some aspect of the College's program and his evaluation of it to the agribusiness advisory committee. This was presented at a dinner given in honor of the graduates. Members of the committee listened attentively, took notes, and asked questions of the class. The entire proceedings were recorded on videotape for later evaluation. Several changes have already been considered and completed as a result of that evaluation.

The program has received outstanding support by industry. Three $100 scholarships were awarded during 1968-69 and two more were awarded this year by the Farmers Grain Dealers Association. The scholarships are presented to students in the agri-marketing program who have demonstrated scholastic achievement and have shown promise of development in the field. Much advise and encouragement has also been received from the Illinois Grain and Feed Association as well as other agribusiness groups.



Some courses at Parkland College are taught using the audio-tutorial or self-teaching approach. This student is studying a unit on swine breeding.

Key to Success

The key to tthe success of any program depends on the students enrolled. Agri-marketing students at Parkland College generally rate high in enthusiasm and ability. Most of them have farm backgrounds and have been enrolled in agriculture occupations programs in high school, so they have a good knowledge of agriculture when they enroll in the program. They are aware of country grain elevators, but few have had experience in any phase of operation, much less the intricacies of management. It is our goal to provide students the knowledge and skill for entering and functioning property in this fascinating area of agribusiness.

BOOK REVIEW

THE PORK INDUSTRY: PROBLEMS AND PROGRESS by David G. Topel. Ames, Iowa: Iowa State University Press, 1968, 236 pp. $8.00.

This book is divided into seven parts that adequately cover the pork industry. It is brief enough to hold the attention of the reader. Part one deals with marketing and consumer acceptance of pork. Chapter one directs attention to the four major areas that will help one better understand the problem faced by the pork industry. The concluding chapter of part one presents the views of the major segments involved in merchandising pork products.

Part two depicts future roles in supplying protein requirements such as relationships of supply, demand, and price; efficiency of grain conversion; and non-meat products. The nutritional influences on high-quality production are discussed in part three.

Disease problems such as health maintenance, outlook of disease problems, and role of disease research are explored in part four. The importance of selection and breeding characteristics on muscle quality are reviewed in part five. Part six provides the reader with information as to how physiological stress is related to production practices and muscle quality. The concluding part deals with labor problems pertinent to the producer and the meat packing industry.

The contributors and the editor of this book are eminently qualified by training and experience. Each has distinguished himself as an author, teacher, scholar, researcher, and business executive. The book is written in such a manner as to claim the attention of the producer, students in technical agricultural programs, and students in junior and senior colleges. This book should be available as a reference book on the shelves of libraries wherever pork is produced.

O. R. Holiday
Arkansas A.M. and N. College

Building Comprehensive Instructional Programs in Agriculture

GLENN Z. STEVENS, Teacher Education
The Pennsylvania State University


Glenn Z. Stevens

Teachers of agriculture all over the nation currently are involved in assisting local school administrators in writing annual and long-range plans for occupational education. A 1969 publication issued jointly by the U.S. Office of Education and Department of Labor titled *Vocational Education and Occupations* is a valuable resource. It lists USOE code numbers and content descriptions for courses in the seven instruction areas in agriculture. In other columns there are Dictionary of Occupational Titles (D.O.T.) codes for appropriate jobs and references to worker traits required.

An Illustration

To illustrate, 01.0104 is an Office of Education code number. The 01. means Agriculture, 01.01 is Agricultural Production, and 01.0104 is the Farm Business Management part of the instructional program.

An occupation for which this unit of study is appropriate is Manager, Farm (agric.) which is designated by the D.O.T. code 409.168 in which the 4 represents the occupational *category* of Farming, Fishery, Forestry and related occupations. The 40 specifies the occupational *division* of Plant Farming, and 409 means that the occupational *group* is not elsewhere classified (n.e.c.).

To continue, the second three-digit set of numbers indicates the degree of relationship to data, people, and things. The 1 means that a farm manager coordinates *data* (a highly complex relationship). The 6 specifies a relatively simple speaking-signaling involvement with *people,* and the 8 refers to no significant relationship with *things* (as a manager the farmer is not a farm hand). The worker traits required are described under headings for physical demands, working conditions, and training time.

Planning Programs

What has all this to do with planning instructional programs? Very much, indeed! If students are to have access to vocational education that is purposeful, continuing, individualized, practical, and attainable, the school must offer courses that are relevant to a worthwhile occupational objective of each student. Agriculture teachers are familiar with the illustration given above. Farm business management instruction is for farm managers and for high school students preparing to become farm managers. Do teachers, counselors, the employment service, and industry personnel managers know what units of instruction in agricultural supplies are needed by a grain processor or fertilizer salesman? Do placement persons know the many jobs open to graduates of programs in horticulture or agricultural resources? Have Bureau of Labor Statistics manpower projections been consulted and regional surveys made?

Comprehensive Program

The charts accompanying this article present a comprehensive program of courses in agriculture for high schools. While prepared for Pennsylvania, perhaps communities in other states will find that the structure of courses can be adapted. There are four basic courses in agriculture which may be taught with as much, or as little, emphasis on agricultural production as needed by most students and the ability of teachers will support.

Four basic courses in agricultural mechanics can provide comprehensive skill training. If each course is elective and on a semester basis, an opportunity is offered for students to individualize their programs by electing only the units that contribute to their specific occupational goals.

On each chart the six courses named last are those that apply to the instructional areas of agricultural supplies, agricultural mechanics, agricultural products, ornamental horticulture, agricultural resources, and forestry. The subject matter and learning experiences in each are outlined and defined in detail in U.S. Office of Education, *Standard Terminology for Curriculum and Instruction in Local and State School Systems,* State Records and Reports Series: Handbook VI, Washington, 1969. Every school district that decides to build new instructional programs in agriculture to serve the needs of large numbers of students interested in growth occupations of the future will find the three publications discussed in this article to be of invaluable assistance.

Attitude, Program, and Money

The first Annual Report of the National Advisory Council for Vocational Education (July 1969) states that three reasons our nation has not yet adequately provided public school occupational education for millions of disadvantaged, handicapped and underemployed young people are *attitude, program, and money.* Through activities such as the FFA and supervised occupational experience, teachers of agriculture have demonstrated a model for success in creating proper *attitudes* toward career development.

Student goals are in terms of behavioral objectives, and self-evaluation yields the satisfaction of achieving mastery of specific competencies. The public is willing to provide the *money* for education that really makes a difference in the lives of people. Our professional responsibility is to design the *programs.* The National Advisory Council Report has this to say about programs:

> Within high schools the student should have multiple choices. A separate vocational school or a distinct vocational track should be exceptions, not rules, in a technical and changing society. Communication and computation skills become revelant in a context that relates them to an employment objective. All students must be allowed to move in to and out of vocational-technical programs and to select mixtures of vocational-technical and academic courses. Students should be released from school to acquire employment experience, and should then be taken back for further education. Students should be able to go to school the year around. It is inconceivable that we plan to continue to let our school plant lie idle three months of the year. Rural schools must give their students opportunities to train for urban jobs, since many of them are bound for the city.

You can adapt the comprehensive outline of courses presented here to meet the needs of boys and girls in your community. When you accept the challenge that young, adult men and women also should have access to continuing, individualized counseling, placement, and instruction you will have a variable, relevant occupational education system.

A Comprehensive Program of Courses in Agriculture for High Schools

Basic Courses in Agriculture and Specialized Courses for the Agricultural Industry

U.S.O.E. Code Number		Grades for which most appropriate
01.00	**The Agricultural Industry** A. Agricultural production, agricultural supplies, and agricultural products B. Agricultural resources, forest resources, and ornamental horticulture	9 or 10
01.0101	**Animal Science** A. Cattle: Dairy and beef B. Livestock, poultry, small animals	10 or 11
01.0102	**Plant Science** A. Grain and forage crops B. Horticultural and specialty crops	10 or 11
01.0104	**Agricultural Business Management** A. Farm business management B. Off-farm agricultural business management	11 or 12
01.02	**Agricultural Supplies:** Feed, seed, fertilizer chemicals, petroleum, and hardware	10, 11, 12
01.03	**Agricultural Mechanics Business Organization, Management, and Operation:** Farm and industrial, materials handling equipment, and structures	10, 11, 12
01.04	**Agricultural Products Processing and Marketing:** Milk, meat, poultry and eggs, fruits and vegetables, cereal grains, flour and oil seeds, and other food and non-food products	10, 11, 12
01.05	**Ornamental Horticulture:** Flowers, landscaping and turf, production, marketing, and services	10, 11, 12
01.06	**Agricultural Resources:** Soil, water, air, wildlife management, and recreation land services	10, 11, 12
01.07	**Forestry:** Forest production and harvesting, wood utilization, and forest recreation services	10, 11, 12

Any combination of courses can be used to best meet specific student, community, and labor market (manpower) needs. One credit is earned for 120 hours of instruction and one credit for 120 hours of supervised occupational experience.

Courses in Agricultural Mechanics

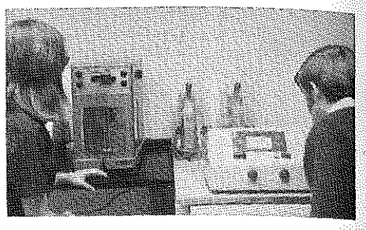
U.S.O.E. Code Number		Grades for which most appropriate
01.0305	**Agricultural Mechanics** (Farm and off-farm) Introduction to Agricultural Mechanics 1. Tool skills: wood and related materials 2. Tool skills: metal, including welding	9 or 10
01.0301	**Agricultural Mechanics** (Farm and off-farm) Agricultural Power and Equipment 1. Tractor maintenance 2. Farm and industrial machinery	10 or 11
01.0301 01.0307	**Agricultural Mechanics** (Farm and off-farm) Small Engines and Electricity 1. Small engines 2. Agricultural electricity	10 or 11
01.0302 01.0306	**Agricultural Mechanics** (Farm and off-farm) Agricultural Structures and Equipment 1. Buildings 2. Materials handling equipment	11 or 12
01.03	**Agricultural Supplies Mechanics**	10, 11, 12
01.03	**Agricultural Mechanics** (Off-farm)	10, 11, 12
01.03	**Agricultural Products Mechanics**	10, 11, 12
01.03	**Horticulture Mechanics**	10, 11, 12
01.0303	**Agricultural Resources Mechanics**	10, 11, 12
01.0304 01.03	**Forestry Mechanics**	10, 11, 12

Each course includes instruction in and preparation for career planning, supervised occupational experience, and FFA leadership development. Courses may be one credit each; they may be one-half credit or two credits per year. The first four courses may be primarily agricultural production or a balanced offering appropriate to all occupational objectives in agriculture.

These courses include the seven instruction (and occupational) areas of vocational and technical education in agriculture. Maximum flexibility for students can be provided by adapting the subject matter to semester, one-year, or two-year courses.

Preparing Technicians for the Food Processing Industry

HAROLD D. SIMPSON
Wilkes Community College
Wilkesboro, North Carolina



Students in the food processing technology program work in the College's quality control laboratory.

In recent years the southeastern states have taken a leading role in the food processing industry. North Carolina has become so involved in food processing that a former governor stated that it was one of the state's fastest growing industries.

Because of the growth of this industry and the increasing demand for trained personnel, the Community College System approved a two-year Food Processing Technology Degree for Wilkes Community College, Wilkesboro, North Carolina. The purpose of the program is to give students an understanding of the principles, methods, skills, and techniques essential for successful employment and advancement in the food processing industry.

Students

Students entering the food processing curriculum should have a better than average high school background in science and mathematics. Biology, chemistry, and two years of algebra are preferred. The student should be one who does not mind getting his hands dirty in the processing plant. The term used for this type of student is "working foreman" or one who has both technical and practical knowledge of the food industry.

The Program

During the first year students visit food processing plants and become acquainted with the flow-lines of dairy product processing, poultry processing, red meat processing, and vegetable-fruit processing. These visits help students decide which phase of the food industry they desire to work with. However, most of the first year is taken up with studies in fundamental courses.

During the first year students take three English courses including report writing, three basic food science courses, two technical mathematics courses including statistics, and three chemistry courses. General microbiology and food plant management are also required the first year.

During the second year students take Speech, Advanced Microbiology, Food Processing Mechanics I and II, Food Regulations and Control, and Quality Control. Also, during each of the three quarters of the second year students take product courses including Professing Poultry, Processing Red Meats, Processing Dairy Products, and Processing Fruits and Vegetables.

One of the practical aspects of teaching the product courses is that when dairy processing is being taught part of the laboratory work is performed in the local dairy; when poultry processing is being taught much of the laboratory work is performed in the nearby poultry processing plant. Local industries have been extremely helpful in opening their doors to students so that they can apply what has been learned in the classroom to an actual, on-the-job situation.

Internship

A unique part of the food processing program is a summer internship. During the summer between the first and second years, students are encouraged to seek employment in food processing firms. The student's college instructor arranges with the firm for the student to work at as many different jobs as possible during the summer. Therefore, a variety of job experiences are gained by students which relate to the product courses taught during the second year.

Graduates

Food processing technology is an excellent field of study for girls as well as boys. Girls perform well in laboratory analysis because they tend to be meticulous in their work. Boys frequently enter supervisory positions because of their leadership ability. In most food industries, both food analysis and processing supervisors are needed.

Graduates of the food processing program find employment in production management, production supervision, quality control, sales and marketing, grading and inspection, and distribution of food products.

Since the food processing program has only been in existence at Wilkes Community College for three years, one class of students has graduated. The graduates have been well received by the food processing industry. All six graduates taking the program full time (a number of students are enrolled part time and work full time in industry) have been employed by the food industry.

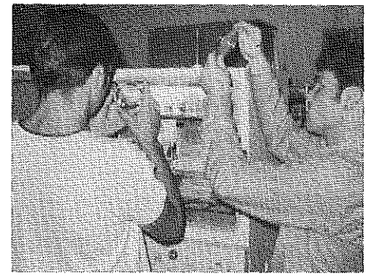
The average salary received by the graduates is over $6,000 per year plus a number of fringe benefits. The food industry likes to employ the graduates because of their related training and on-the-job experiences. Industry has found that only a minimum amount of job orientation and training is needed in order to utilize the graduates.

Recruiting Students

The basic problem of any new curriculum is enrollment. It is a difficult task to acquaint, educate, and recruit qualified students. Much of the instructor's time is taken visiting high school counselors and speaking to science classes in order to acquaint students with job opportunities in food processing technology and related fields. With the population increasing at a rapid rate, the food processing industry and food processing technologists have a bright future.

A Post-High School Program in Food Processing

WAYNE G. KOENE, Agriculture Coordinator
Fond du Lac Technical Institute
Fond du Lac, Wisconsin



Students in food manufacturing check microbial growth in petri dishes in a course on microbiology.

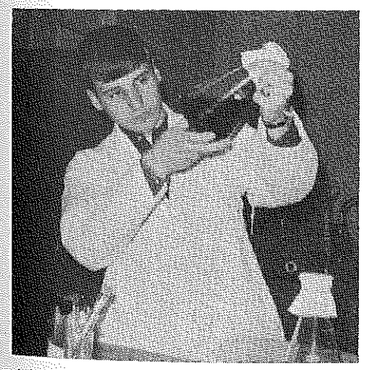
Wisconsin has traditionally been known as "America's Dairyland." In fact, this is the slogan printed on all Wisconsin automobile license plates.

This claim can easily be justified by the fact that the state leads the nation in the production of fluid milk, cheese, dry milk, malted milk powder, and sweetened condensed milk. Wisconsin ranks second in butter, unsweetened condensed milk, and dry skim milk.

Lesser known but equally significant to Wisconsin's agricultural resources is the fact that the state also leads the nation in the production of processed vegetable products, specifically green peas and beets. Production of sweet corn, early fall cabbage, cranberries, and sauerkraut is second with high national rankings for the production of maple syrup, early fall carrots, lima beans, snap beans, and pickles.

Food Processing Curriculum

It is obvious that the demand for technicians in the food processing industry in Wisconsin is especially acute. To meet the needs of the industry, a two-year post-high school curriculum in food manufacturing was begun at the Fond du Lac Technical Institute in Fond du Lac, Wisconsin, in the fall of 1967. The program is a part of the educational program of the Board of Vocational, Technical and Adult Education—District 10 of which the Fond du Lac Technical Institute is a member school. District 10 was chosen among the eighteen vocational districts in Wisconsin to conduct the program because of its proximity to the geographical center of the state's food processing industries.



Advanced courses include exercises in food preservation and manufacture of food products. Here a canning-freezer major checks the fermentation of wine made as a class project.

Students in the food manufacturing technology curriculum have a choice of two major areas of specialization: dairy industry and canning-freezing industry. Students in both majors are required to take courses in general bacteriology, food chemistry, food plant sanitation, food plant equipment operation and maintenance, quality control for food industries, survey of the food industry, communication skills, business math, economics, psychology, American institutions, and personnel management.

Specialized training is given to the dairy majors in dairy microbiology, dairy marketing, and advanced dairy product processing. Canning-freezing majors take courses in food microbiology, water and its uses, and advanced food preservation techniques. Both groups have opportunities to take elective credits in other academic areas such as advertising, marketing, welding, typing, business administration, business law, and public speaking.

A popular elective is the summer work experience internship. Students receive three credits for participating in the program by working in a food industry during the summer between their first and second year. The minimum requirement is 240 total hours of work that is supervised by the employer and a school representative.

Graduates

Students graduating from the program receive an Associate Degree. They are qualified for mid-management entry positions in food industries such as quality control technicians, laboratory supervisors, personnel supervisors, foremen, raw product supervisors, fieldmen, salesmen, inspectors and graders, for example.

Of the initial class of five students, three were placed in nearby food industries immediately upon graduation. The other two are currently in military service. One graduate is an assistant laboratory supervisor for a large dairy producing fluid milk, cottage cheese, and ice cream products; another is a canning foreman for Wisconsin's newest and largest pea and sweet corn canning factory; the third is working in a commercial bakery.

Now in its third year of operation, the current enrollment in the program is twenty-one. There is nearly equal distribution of dairy and canning-freezing majors at the present time.

It is anticipated that there will be more job opportunities than graduates based on current experience. For example, there were approximately four to five job offers directed to each of the 1969 graduates through the school's student services department which assists in placement of all the school's graduates. In fact, one student was placed six months before graduation!

(Continued on page 201)

TEACHING ABOUT OCCUPATIONS AND QUALITY CONTROL IN MEAT PROCESSING

DONALD E. McCREIGHT, Teacher Education
University of Rhode Island

Donald E. McCreight

This article is based on Dr. McCreight's Ph.D. dissertation, "A Vocational Teaching Experiment on Occupations and Quality Control in the Processing of Meat," which was completed at The Pennsylvania State University in 1969. Glenn Z. Stevens, Professor of Agricultural Education at The Pennsylvania State University, was Dr. McCreight's major adviser.

According to the National Commission on Food Marketing, meats are the most important group of foods in the consumer's budget. Consumers spend 24.5 percent of the food dollar for meat and meat products. Meat animals comprise 43 percent of the total net farm sales of food products. Since meat animals represent the largest single item sold by farmers and the largest single food item purchased by consumers, it is logical that curriculum materials for the processing of meat should be developed and used by teachers of agriculture.

Meaningful Instruction

In traditional agricultural production programs, students are taught to identify breeds of livestock, to judge livestock, and to identify cuts of meat. Why does instruction stop at this point? Can meaningful instruction be provided for high school students in processing meat and meat products?

In a curriculum in food handling and distribution developed at the University of Connecticut, the authors proposed a need for experiences which aid secondary and post-secondary students in acquiring a broad knowledge of food products and quality control. It was concluded that teachers of agriculture should be involved in providing this instruction to prepare students for food handling and distribution occupations.

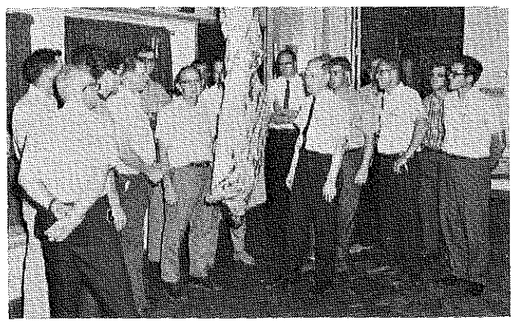
Smeltz[1] analyzed occupational titles and competencies in twenty-five agricultural food products processing plants in Pennsylvania. The study included five of the largest meat processing plants in Pennsylvania. Each personnel director rated the competency levels needed to enter and to advance for all occupational titles in the meat processing plant. Meaningful occupational title groups and competency groups were determined for the processing of meat and meat products.

An Experiment

Using this information two student resource units, one on occupations and one on quality control in the processing of meat were developed and tested. Four hundred high school students in twenty-four Pennsylvania schools were in the vocational teaching experiment. The accompanying chart illustrates the course outline for occupations and quality control in processing of meat.

A teacher's guide was developed to aid advance teacher preparation and increase the use of instructional resources. The guide included student objectives, key questions, suggested references, suggested resource personnel, suggested field trips, and procedures for using the student exercises. The use of the teacher's guide increased student achievement.

A set of colored slides and script was developed to depicit occupations in the processing of meat and meat products. One-half of the students in the teaching experiment used the slides and student resource unit on occupations in the processing of meat, but did not receive formal instruction. The other students received formal class instruction by the teacher of agriculture using the colored slides and the unit on occupations in the processing of meat. Student achievement was greater for the formal class instruction.



Teachers discuss meat inspection with a state veterinarian during inservice education.

[1]Smeltz, L. C. *An Analysis of Occupational Titles and Competencies Needed in Agricultural Food Products Processing Plants.* Thesis, D.Ed., The Pennsylvania State University, 1969.

Course Outline for Occupations and Quality Control in Processing of Meat

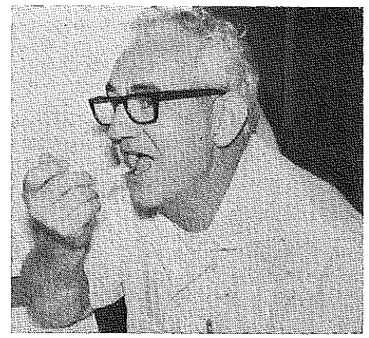
UNIT I: Occupations in the Meat Processing Industry
- —Job Opportunities in Meat Processing Plants
- —Occupational Information: nature of the work and worker traits, physical demands, working conditions, training time, and future trends
  - A. Workers: worker, processor
  - B. Production Supervisors: production supervisor, department head
  - C. Mechanics: truck driver, maintenance mechanic, engineer
  - D. Quality Control Technicians: grader, inspector, buyer, quality control technologist
  - E. Office Workers and Salesman: bookkeeper, office manager, salesman, sales manager
  - F. Managers: production manager, general manager

UNIT II: Quality Control in the Meat Processing Industry
- —What Meat Quality Control Means to the Consumer
- —Grading Meat and Meat Products
  - A. Identifying Meat and Meat Products: physical characteristics and composition of the carcass; meat cuts (wholesale and retail); and processed products
  - B. Testing Meat and Meat Products: physical tests for color, firmness, texture, marbling, taste, and tenderness; chemical tests for protein and moisture
- —Inspecting Meats and Meat Products
  - A. Inspection Laws: federal, state, local
  - B. Inspection Tests of Meat: bacteriological tests, biochemical tests
  - C. Sanitation Practices: worker, equipment, environment
- —Preparing, Storing, and Distributing Meat
  - A. Preparing: boning, grinding, mixing, cooking, curing, packaging
  - B. Storing: time, temperature, other environmental conditions
  - C. Distribution: transportation environment to include delivery conditions, retail holding, and display and consumer holding
- —What Quality Control Means to Meat Plant Employees

A Course for Teachers

In the summer of 1969, the third in a series of courses to prepare teachers for instruction in Agricultural Food Products was conducted. Teachers who had been in the teaching experiment, realizing the need for more knowledge and skill, enrolled in the course.

Twenty teachers of agriculture participated in a one-week, credit course on meat animal evaluation offered by the Department of Food Technology in cooperation with the Departments of Agricultural Education and Animal Science at the Pennsylvania State University. The course included topics relating to live animal evaluation; slaughter of livestock; operation of the meat animal evaluation center; chemistry of meat and meat products; cutting, evaluating, and grading meat; meat inspection programs; pricing of meat and meat products; cooperation of the packer and producer; laboratory tests for meat; and a taste panel to evaluate meat products.



The final taste test

The course started with the production of a quality meat animal, and ended with a consumer-oriented panel to taste the final meat product.

Teachers of agriculture can provide meaningful instruction in the processing of meat and meat products and the processing of other agricultural food products.

A Post-High School Program in Food Processing

(Continued from page 199)

Advisory Committees

Extensive use is made of two advisory committees for the program. A state food manufacturing advisory committee, meeting once per semester, recommends changes in curriculum, course content, and instructional emphasis. The other committee, a local advisory group, deals primarily with equipment recommendations. Both committees are also very active in assisting with recruiting and placing students, summer internship programs, and other matters of concern. Members are drawn largely from representative food industries in the state and midwest.

A close liaison has been established with the University of Wisconsin Food Science Department and professional organizations such as the Wisconsin Canners and Freezers Association, the Wisconsin Dairy Foods Association, the Wisconsin Cheesemakers Association, and the Institute of Food Technologists.

Teaching Staff

The teaching staff in the Food Manufacturing Department is comprised of two full-time instructors and two instructors with part-time teaching responsibilities for the department. All have educational backgrounds in the food area plus extensive work experience in the food industry.

Teaching methods are based on close student-teacher relationships through lectures, practical laboratory exercises, use of experts in the field as resource speakers, and extensive field trips to nearby food industries and, occasionally, to state and national food expositions and conferences. All classes are held in a modern school built in 1964. An extensive remodeling program for the benefit of the program was completed during the summer of 1969. The size of the laboratory was doubled along with purchase of much additional sophisticated laboratory equipment to increase the effectiveness of the instructional program. The Fond du Lac Technical Institute now has optimum capacity for at least forty new students in the program each year—twenty in each major. Unfortunately, the biggest problem encountered so far has been in the recruiting of students.

A New Approach to Vocational Agriculture in India

LOWELL E. HEDGES
Coordinator of Curriculum Development and Instruction
Elgin Local Schools
Marion, Ohio

Babu Lal has completed his first year in vocational agriculture at the Demonstration School, Regional College of Education, Ajmer, India. He plans to continue in the vocational agriculture program and enter farming with his father and older brother at the village of Ratidang. Babu Lal has a farming program which includes twenty hybrid White Leghorn hens that are in full production, along with a 20′ by 20′ plot of land that he uses for growing Hybrid Mexican wheat.

Babu Lal (second from left) and his father are taught to identify weeds in wheat by the teachers of agriculture during a home visit.

It is toward this kind of student that the new vocational agriculture program in India is aimed. Babu Lal is representative of thousands of boys who have terminated their education for various reasons who are now working at home with their families and are most likely to become Indian farmers. In India, approximately 82 per cent of students drop out of school before they are fourteen years old.

To break the long-standing cycle of inefficient, unproductive, "traditional" agriculture, it is necessary that these prospective farmers be trained to provide adequately for themselves and their families and to make a contribution to the community, state, and nation as competent rural citizens.

• A Teacher Offers Help

I had the experience of assisting the Regional College of Education at Ajmer develop educational programs that would help solve this problem. After teaching vocational agriculture in Ohio for ten years, I found the two years in India to be one of the most interesting and challenging experiences of my teaching career.

The five-man Indian Agriculture Education staff at Ajmer was an enthusiastic and energetic group. They were trained in India and dedicated to the development of productive agriculture and relevant education in agriculture. My contribution was primarily in the areas of planning and procedures and in adapting some of the successful concepts of agricultural education in the United States to the Indian conditions.

• A New Approach

Indian teachers of agriculture enrolled in a summer workshop in 1966 conducted by the four Regional Colleges of Education examined agricultural education programs in their secondary schools and arrived at this conclusion: "The main defect of the present education (system) in agriculture is that it is narrowly conceived, laying too much emphasis on bookish knowledge, overcrowded with insignificant details, insufficiently adapted to individual differences, dominated by examinations, and out of time with life. It is more subject centered. The instruction being imparted in agriculture is so theoretical and divorced from the practical application that it does not serve any useful purpose."

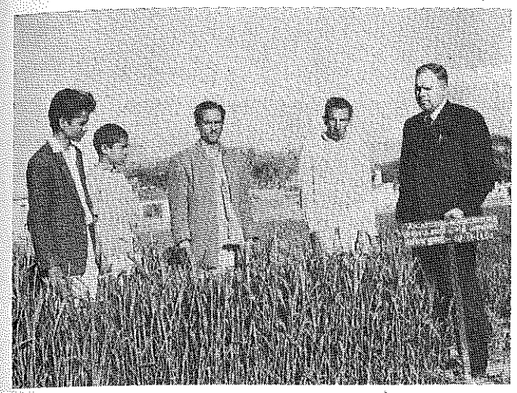
They concluded that an agricultural education program needed to be designed and implemented that would serve the needs of the vast pool of untrained youth who are to become farmers of India. A program to train farm boys to become modern, productive farmers was started in July, 1967, in the Demonstration Multipurpose Higher Secondary School attached to the Regional College of Education, Ajmer, Rajasthan. The program was designed to prepare a farm boy for establishment as a successful full-time, self-employed farm operator and responsible rural citizen. Criteria and procedures were adopted to insure that students would be enrolled who were most likely to become farmers.

• The Students

The students in the vocational agricultural education program established at Ajmer came from four villages as far as five miles from the Demonstration School. About 600 people would be the average population for the villages.

Boys selected for the program had to meet certain qualifications. Only those boys enrolled who had an opportunity to move into full-time managerial operation of a farm, were physically capable of doing normal farm work, were within walking or cycling distance of the Demonstration School, were within the age range of fourteen to twenty years, and had completed at least their primary education. Eighteen boys were enrolled in the first class.

The students attended classes at the school only during the fall and winter months when farm work was at a minimum. This arrangement permitted them to work full-time at home during the planting and harvesting seasons in spring and summer. Approximately sixty days were allotted for working at home full-time during the normal school year. This procedure provided approximately a 170-day school year, exclusive of holidays and vacations for the vocational agriculture students.



Lowell Hedges (right), U. S. Consultant in Agricultural Education of The Ohio State University Education Project in India, surveys a student's project with the teacher and the student's family.

The daily schedule provided for four hours of formal school work. The boys came to the Demonstration School at 11:30 a.m. and went home at 3:30 p.m. This four-hour schedule was developed in cooperation with the parents, teachers, and village leaders.

The two high school agriculture teachers taught this course along with their regular agriculture program in the Demonstration School. Each teacher taught two hours and both supervised the home-farm occupational experiences of the students. During the planting and harvesting seasons when the boys were not in school, their activities on the farm were supervised by the teachers.

• Farming Programs

One main reason for the success of the vocational agriculture program is the on-the-farm instruction provided by the two teachers. On-the-farm instruction and supervision make possible the translating of theory into practice. The teachers average about two visits per month per student. To make their visits, the teachers either walk, use a bicycle or motorscooter, or use the College's Jeep.

Each student at the beginning of the program had a 20′ by 20′ plot of land on his home farm to use for demonstration purposes. This seems like a small sized project, but considering the fact that farms in the area average from one and a half acres to about twelve acres in size, the school felt very fortunate in achieving this size of plot. On these plots, the students sowed Mexican wheat under the supervision of the teachers. The students used improved production practices in preparing the seedbed, seeding, fertilizing, irrigating, and controlling weeds.

A yield check on a per acre basis showed that the projects yielded in some cases more than double the average local yield of wheat. The home projects seemed to have had a favorable impact on the parents and other farmers in the villages.

• How Well Has It Worked?

From the point of view of the students, parents, village leaders, local secondary school teachers, and the agricultural education staff at the Regional College, the vocational agriculture program for farm boys is feasible and beneficial. Students are able to translate theory into practice through their home projects. They have educated local farmers through these home projects also.

On the national level, a proposal for 300 such vocational agriculture programs for farm boys was made in September, 1967, by a national government committee on agricultural education. The Ministry of Agriculture was given the responsibility for administering and supervising the programs. This proposal was to be completed within the remainder of the Government's fourth Five-Year Plan (1968-1971).

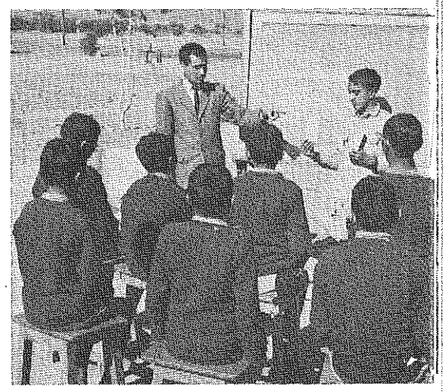
• Summary

A start has been made in India to prepare farm boys for establishment as successful full-time, self-employed farm operators and responsible rural citizens. The selection of students is one of the key ingredients for the success of the program. The proper student has to be enrolled in the program. He should be a farm boy who has a desire and an opportunity to farm in the future.

An unsolved problem is the recruitment and training of enough teachers to man the vocational agriculture programs once they are established. Teachers are needed who sincerely believe in the vocational aspect of teaching agriculture.

Successful vocational agriculture programs will also require knowledgeable supervision on the state and national levels. The absence of supervisory personnel, as well as teachers, is the subject of the present planning taking place.

Agricultural education in India seems to be on its way to becoming truly "vocational" and a potential force in the struggle to improve agricultural production and the standard of living for rural India.



Vocational agriculture courses for village boys include instruction in mathematics to aid students in calculating seed, fertilizer, and irrigation needs.

Educational Programs for Laboratory Animal Caretakers and Meat Inspectors

LEON A. MAYER and LLOYD J. PHIPPS
University of Illinois

Agricultural educators need to give more attention to manpower needs that are not related to farming. There has been a tendency in broadening the scope of vocational agriculture from production agriculture to all occupations requiring knowledge and skill in agriculture to give priority to farm-related occupations. The time has arrived, however, to study and develop educational programs for persons in occupations requiring knowledge and skill in agricultural subjects that are not ordinarily considered agricultural occupations by laymen.

The applied animal science occupational category includes many agricultural occupations. Some applied animal science occupations are typical farm or non-farm occupations which are basically production oriented. Included in the applied animal science occupational category, however, is a significant number of non-production oriented occupations. Both the non-production and the production oriented jobs in the applied animal science occupational category require knowledge and skill in applied animal science for effective job performance.

Two applied animal science occupations analyzed in a study conducted at the University of Illinois were the occupations of meat inspector and the laboratory animal caretaker. These occupations are typical of the non-production oriented applied animal science occupations. The research project involved a field study of manpower needs and competencies required by workers in animal laboratories and in meat inspection agencies.

Manpower Needs

The study revealed that approximately 250 animal laboratories in the United States employ an estimated 5,000 laboratory animal caretakers, and that the demand for these personnel will probably double by 1975. There is an urgent need for and a national concern for increasing the technical competence of animal laboratory caretakers. The demand for trained workers will increase even more in the future because of the development and use of special research animals in increasingly sophisticated research programs.

On a regional basis, the thirty animal laboratories surveyed within a thirty-county area of northern Illinois employed a total of 354 animal caretakers at four job levels. These laboratories estimated that 492 additional animal caretakers would need to be hired during the next five years, with about 80 percent of this number needed at the beginning-worker job level.

The study revealed that approximately 51,170 persons were employed as federal meat and poultry inspectors in the United States. Federal officials anticipated that approximately 600 meat and poultry inspectors would need to be hired each year during the next five years. In the thirty-county northern Illinois area surveyed, federal and state meat and poultry inspection agencies currently employ approximately 232 meat and poultry inspectors. Approximately 215 additional meat and poultry inspectors will be hired during the next five years at the new-worker job level.

The animal laboratories and the meat inspection agencies surveyed indicated that they would like to hire trained personnel for beginning worker jobs, but that a supply of trained laboratory animal caretakers and meat inspectors did not exist in northern Illinois. Systematic occupational education programs for these jobs were found to be non-existent in northern Illinois. Consequently, the establishments were forced to recruit new workers from the open labor market and to devote six months to a year to on-the-job training. They would upgrade minimum qualifications for applied animal science jobs if a source of trained workers could be developed.

Competencies Needed

When asked to respond to a questionnaire to determine the competencies needed for optimum job performance, thirty administrators, supervisors, and experienced workers from animal laboratories and meat inspection agencies identified the following competencies as needed by new workers in laboratory animal caretaker jobs.

Leon A. Mayer

Lloyd J. Phipps

This article reports the findings of Dr. Mayer's Ed. D. dissertation, "Occupational Education for Meat Inspection and Animal Laboratory Caretaker Jobs," which was completed at the University of Illinois. Leon A. Mayer is Off-Campus Representative, Division of University Extension, University of Illinois, Dixon, Illinois. Lloyd J. Phipps is Chairman of the Department of Vocational and Technical Education, University of Illinois, Urbana.

—Identifying species and breeds of laboratory animals.

—Recognizing normal growth rates, final sizes, and form and appearance of normal, healthy laboratory animals.

—Recognizing structural parts of animals, their functions and abnormalities; the normal process of parturition and possible abnormalities; the hormonal changes associated with pregnancy; and common nutritional deficiencies of laboratory animals.

—Knowing common physiological systems; the growth and reproductive processes; elementary terminology of genetics; breeding habits and cycles, hormonal and physical bodily changes associated with the birth process; what to expect in normal births and how to assist in abnormal births in laboratory animals.

—Knowing nutrition requirements and the process of feed digestion; identifying specific nutritional needs of various species and recognizing nutritional deficiencies; identifying sources of feed nutrients; and preparing and feeding a prescribed ration to laboratory animals.

—Managing and handling laboratory animals for purposes of moving, feeding, watering, breeding, cleaning housing areas, administering treatments, and examining; and performing post-natal care and sanitary practices.

—Preparing animals for surgery and assisting in post-operative care; performing simple technical procedures, such as venipunctures and inducing death humanely.

—Practicing animal sanitation for disease and parasite prevention; recognizing symptoms of common laboratory animal diseases and parasites; identifying internal and external parasites and rodent and vermin pests of laboratory animals; knowing the possibilities for transmission of animal diseases between and among species, including man; and the necessity and requirements for isolation and quarantine of newly acquired or diseased laboratory animals.

—Developing and using a system for marking animals and for keeping records on laboratory animals.

—Various general background knowledges, skills, and understandings in mathematics, chemistry, bacteriology, problem solving and the experimental method, oral and written communications, human relations and leadership, and company or agency policies and procedures.

The competencies needed by new workers in meat inspection jobs were quite similar to the competencies needed by laboratory animal caretakers. However, the items pertaining to identification and recognition of species, breeds, form and appearance, and diseases and parasites pertained specifically to meat producing animals rather than laboratory animals. Some additional competencies needed by new workers in meat inspection jobs were:

—Recognizing the cuts of meat and meat products, performing dissection skills, and locating and incising and recognizing abnormalities in the glands, organs, and other parts of meat producing animals.

—Performing the visual and digital examination and taking the body temperature of a live meat producing animal for the purpose of detecting disease or abnormalities.

—Knowing the necessity and requirements for isolation and quarantine of diseased animals and the safety precautions for meat inspection personnel handling these animals.

—Various general background knowledges, skills, and understandings in mathematics, chemistry, bacteriology, problem solving and the experimental method, oral and written communication, human relations and leadership, and company or agency policies and procedures.

Level of Competency

Experienced laboratory animal caretakers and meat inspectors need a higher level of competency in certain areas than new workers in these two occupations. Higher levels of competency are needed primarily in the areas of human relations and leadership, communication, science background, diseases and parasites, nutrition, and in skills involved in working with animals.

Several items of competency in addition to those needed by new workers are needed by experienced workers in the two occupations. It is interesting to note that, for the most part, the additional competencies needed by experienced workers involved competencies needed by new workers in the other occupational category. The respondents felt that experienced workers in laboratory animal caretaker jobs should have knowledge at an appreciation level about species, breeds, and disease, parasites, and nutrition of meat producing animals. Respondents also felt that experienced meat inspectors should have similar general knowledge concerning these same areas which relate specifically to laboratory animal caretaker competencies. This finding seems to reinforce the notion that there are many areas of competency which are needed in common by both laboratory animal caretakers and meat inspectors. Consequently there seems to be a good basis for suggesting that occupational education programs for these two occupational areas, as well as for other applied animal science occupational areas, be established for a family of occupational areas rather than for a single occupation.

Programs Needed

Students in high school should be informed about the potential of these two occupational fields for employment. Agricultural education programs at the high school level should be evaluated to determine whether or not they include the basic foundation knowledges and skills required in these two occupational areas. Concurrent work-education programs should be established so that interested boys and girls studying agriculture in high school could receive occupational experience in animal laboratories and in the non-hazardous aspects of poultry and meat handling. Persons completing an applied animal science occupational program at the high school level should be employable as a beginning laboratory animal caretaker or meat inspector.

Pre-technical and technical programs for animal laboratory technicians and for meat and poultry inspectors should be established at the post-secondary level in selected institutions. These institutions and other institutions should offer adult occupational education programs for workers in these two occupational areas.

VOCATIONAL AGRICULTURE AND THE CHALLENGE OF RURAL POVERTY

HENRY E. SCHMITT, Teaching Associate
The Ohio State University


Henry E. Schmitt

Amidst the richest nation known to mankind is a shocking fact that one out of every six Americans are poor. A high proportion of them are destitute to the extent that families receive a mere 800 calories per day, compared to an average intake of 3,120 calories per day. Pellegra, rickets, and scurvy, diseases supposedly nonexistent in this country, are commonplace among the rural poor. Even more tragic in this human drama are children possessing chronic sores of the upper lip, distended stomachs, large eyes and extreme lithargis conditions, all trademarks of serious malnutrition.

Programs of vocational agriculture have served rural America for over 50 years. In many rural high schools, agricultural education is the only vocational program available for students, young farmers and adults. Have our selection, curriculum, and program planning criteria been designed to also meet the needs of the rural poor? What can be done through agricultural education programs to help alleviate this paradox facing millions in rural America?

A Commitment

There is a commitment in America today, possibly new in degree if not in kind, to agricultural education as an instrument in assisting the rural poor. Legislation has emerged to assist in program development, training and retraining, and providing people with opportunities for gainful employment. The Vocational Education Amendments of 1968 authorize funds for person who have academic, socioeconomic, or other handicaps that prevent them from succeeding in the regular vocational programs.

The dimensions of chronic poverty in rural America are well known. Former Secretary of Agriculture Freeman ascertains that rural poverty consists of too little of everything—jobs, income, services, education, and a continuing one-way exodus of people from country to city, which is damaging to country and city alike.

Education in rural America is about two years behind urban areas. This gap may increase drastically by 1980. It may be surprising to most Americans, as pointed out by the 1967 President's National Advisory Commission on Rural Poverty,[1] that there were more than 700,000 adults in rural areas in 1960 who had never enrolled in school. About 3.1 million had less than 5 years of schooling. Even more important is the fact that 1.6 million poverty families are engaged in production farming; 6 million children under 18 years of age represent potentially the genesis for millions of new poverty families in the United States. This is the source of our discontent.

This pool of adults with low levels of educational achievement is being fed by a continuous stream of rural youth. More than 2.3 million rural youth aged 14 through 24 dropped out of school before graduation in 1960. About 8.7 percent of the some 199,000 completed less than five years of schooling. Poverty begets poverty.

Proportionately, there is more poverty in rural America than in cities. In metropolitan areas, for example, one person in eight is poor; in the suburbs the ratio is one in fifteen. Strikingly, in rural areas one of every four persons is poor.

1*The People Left Behind,* A Report. The President's National Advisory Commission on Rural Poverty, U. S. Government Printing Office, Washington, D. C., September, 1967.

Overcoming Obstacles

Teachers of agricultural education must become increasingly cognizant of the age if relevant programs for the rural poor are to be developed. First, the "knowledge industry" has resulted in influencing the requirements needed by rural people in making wise economic, social, and political decisions. Second, agricultural education has provided the ignition for farm technological advance, thus requiring progressively less human labor in producing food and fiber for domestic needs, foreign markets, and substantial overseas donations. And third, the civil and human rights movement is changing the social order and perhaps the goals of agricultural education and the school and non-school environments.

Needed Developments

Programs of vocational agriculture can assist in providing the impetus necessary for an amenable solution to rural poverty. However, vocational agriculture alone is not the panacea for combating this serious problem, but a joint effort is required by all within the school organization.

In view of the magnitude, causes, and location of rural poverty in America, vital program adjustments in vocational agriculture are needed. The following guidelines are suggested.

One of the foremost goals of agricultural education should be to educate the rural American poor. Re-examination and changes in current school policies at the local level are imperative. Additional time, flexibility, differential staffing, smaller class loads and a focus on learning as a life-long continuous process are needed.

Realistic career objectives for the rural poor must serve as a guide for classroom and occupational experiences. Related class instruction should receive increasing attention for perception of communicative skills (reading, writing, and arithmetic) needed for job selection, careers, and entry into the world of work. Occupational experience programs should be consistent with the interests, abilities, understandings and aspirations of the clientele to be served.

Cooperation and coordination with other school specialists is necessary. Pre-vocational experiences and vocational guidance and counseling are needed to assist students in making beneficial educational and occupational choices. Intrinsic motivational elements, self-perception, and positive attitudes toward school, learning, and the world of work must be perpetuated.

A genuine effort must be made for parental involvement in the education of their children.

Specially prepared agricultural education teachers are needed. Clinical diagnosis laboratories, both on-campus and off-campus, are needed for agricultural education teachers. Cultural backgrounds, life conditions, and the total environmental setting requires understanding if teachers are to feel compassion, empathy, and support educational programs for the rural poor.


Rural poverty imprisons 14 million Americans. Poverty is visable in almost every rural school district throughout the nation. What opportunities are available in vocational agriculture for the rural poor?

A Fallacy

The conception that "pockets of poverty" exist throughout this nation is a fallacy. Poverty refuses to remain in pockets, but can be found in all rural areas throughout the United States. Teachers of vocational agriculture, regardless of geographical location, can find poverty within their communities.

However, it cannot be denied that heavy areas of concentration occur in the South. Outside of the South, Indian reservations in the Southwest and the upper Great Plains contain distinct concentrations of rural poor, along with New England and the upper Great Lakes regions.

Severe rural poverty can be found in the Appalachia region, the Coastal Plain to the east, the Ozarks to the west; and the Mexican-American segment along the southern border.

Vocational agriculture teachers are faced with the task of providing educational opportunities for a vast array of rural poor. Contrary to popular opinion, the majority of rural poor are white Americans. Although the percentage of non-whites living in poverty is greater than the percentage of whites, 11 of the 14 million rural poor are white. Also sharing in this perplexed dilemma are Indian Americans and Spanish Americans.

The Time Is Now

The fact that 14 million American rural people have been left behind by an affluent society should be reason enough for immediate action. Vocational agriculture has served well the needs of rural Americans—its major concern has been well-being of rural people with a focus on their occupational life. The winds of change have certainly occurred in agricultural education programs; however, the rural poor can no longer be avoided. Is the profession ready to meet the challenge?

NEW EDITION OF AGDEX

A new edition of AGDEX, the filing and coding system for agricultural publications, is now available from the Publications Department of The American Vocational Association. The system, which includes a spiral bound filing guide and 1,128 gummed file folder labels, uses the same filing system as the first edition. Additional sections now provide for filing professional materials and materials relating to off-farm agricultural occupations. An open section is included as well as new and simplified directions for use.

This new edition of AGDEX resulted from action of the Professional Information Committee of the Agricultural Education Division of A.V.A. who found AGDEX being used in 30 states and provinces in the United States and Canada. The committee determined needed changes and improvements and the Agricultural Education Division endorsed the use of this filing system in all of the states.

The AGDEX Filing System sells at $4.00 per copy and may be ordered from Publication Sales, American Vocational Association, 1510 H Street, N. W., Washington, D. C. 20005. Orders not accompanied by payment will have postage and handling charges added to the bill.

Pilot Program in Agricultural Products for High School Students

WILLIAM T. ROMUNDSON
Teacher of Agriculture
Rosholt, Wisconsin

The word "education" has many meanings. To some it is textbooks and problems; to others it is providing experiences which assist youth in developing a better perspective of self. In vocational programs the series of educational experiences help the student gain understandings of self as they are related to the world of work. Most graduates of Rosholt (Wisconsin) High School would like to remain in that community, where the deer are plentiful and where they find trout in a babbling brook. Most of the students would live here if jobs and suitable education for those jobs were available.

Program Revision

After reviewing the vocational agriculture program at Rosholt High School, it was decided that revision should be made for providing more experiences for students. Upon further study, it was decided that not only should more experiences be provided, but experience in an area that would provide training for work areas that would keep students in the community or close by. There is a high level of interest in the vocational agriculture program as indicated by an enrollment of 86 students in high school classes for 1967-68. Total high school enrollment, grades 9-12, for that year was 253.

An "Agriculture Industry" program submitted by officials at Rosholt High School was one of the pilot programs approved by the Wisconsin Vocational Agriculture Pilot Program Committee. The program started in July 1968. We are now in our second year of operation. The program deals basically with meats and the meat industry.

Agriculture Industry Program

The Agriculture Industry program covers the processing of meat, meat grading, pricing, and merchandising with the objectives of the course being two-fold. First of all, we are interested in giving students training whereby they can gain employment after high school with a definite skill. Second, we know that not all are going to be employed or will want to be, but they can be better consumers because of this course.

In trying to achieve these objectives we give students the experience of processing meat animals, both in live and carcass form. They start out with utility grade animals and work up to the higher grades, so that not only do they have the experience of processing but gain a knowledge of quality meats. Students are also taught that the meat industry is more than processing. For example, they do a unit on advertising and merchandising.

The school's laboratory facilities are small so enrollment is limited to 12-14 students. The students are seniors who show an interest in meats. Enrollment is not limited to boys. Several girls are enrolled. The guidance department has cooperated very well in enrolling students.

Activities

Students work both in the meats laboratory and at the local abbattoir. Two days a week for two hours each time students work with the local processor learning some of the basic fundamentals of slaughtery. A local processing plant permits students to work with their regular employees.

During the course, which runs for the entire school year, the following topics are studied.

—Introduction to meats
—Type of meats available which includes a field trip to local supermarket so students get an idea of types and varieties of meat
—Factors affecting meat quality

Students in the Agricultural Industry Program at Rosholt High School study the wholesale cuts of beef.

—Flavor testing
—Meat cutting which includes actual process followed all the way from slaughtery to breakdown into retail cuts; wrapping and sausage making.
—Advertising

From the basic course we trust that the experience these young people have gotten will enable some of them to take their place in the community with gainful employment. This past year six students were placed with supermarkets and slaughtering plants, but many more could have been placed. There were three jobs for every student graduating from the course.

Food Processing Technology— A Role of the Two-Year College

GLENN H. OLMSTEAD
Agricultural and Technical College
Morrisville, New York

When high school graduates look ahead to post-high school education, many fail to consider or overlook an interesting, challenging, and rewarding area — food processing technology. It's an easy matter to speculate on the reasons for this lack of interest — low pay, long hours, more glamorous areas, need for greater promotion and more information by colleges, lack of industry support, and so on. But this speculation is nonproductive. What is productive and what is known is this: the industry is a dynamic one; opportunities for two- and four-year college graduates in food processing technology are substantial; and, the industry is in very short supply of college prepared employees.

The Curriculum

The food processing curriculum at the State University College at Morrisville, New York, was first offered in 1945. This was the result of cooperation and work by the College and the New York State Canners and Freezers Association, now the Associated New York State Food Processors, Inc. Post World War II emphasis on quality control of food and increased need for technicians led the Association's Education Committee to survey two-year colleges in New York State for the purpose of establishing a program in food processing. Morrisville was selected and the first class was graduated in 1947. The Education Committee of the Association continues to serve as advisor to the College's food processing department which contributes to a changing and thoroughly modern curriculum reflecting changes in the industry.

The purposes of the program are two-fold: to serve the individual student and the food processing industry. The curriculum provides industry with personnel who have completed two years of technical training. These young men and women are provided a background in theory of the conventional and newer methods of food preservation as well as strong practical experience gained in a modern pilot plant and in summer work with food processing companies. The food processing curriculum is not research oriented, but the student does learn the "why" as well as the "how" of food preservation. Two-year food processing graduates enter the industry at the "grass roots" level in food processing plants, as supervisors in production and maintenance, technicians in quality control, salesmen, and so on.

The curriculum is so designed that many students with strong preparation in high school mathematics and science, who perform well during their two years at Morrisville, transfer to a four-year college to pursue a baccalaureate program in food science. A number of these students continue with graduate programs.

The food processing curriculum includes the sequence of required and elective courses indicated by the accompanying chart. Students also receive credit for summer cooperative employment experience between the first and second year. Food processing electives include meat processing, packaging, food plant maintenance and equipment, pilot plant supervision, and quality control. All food processing and closely related courses include laboratory work as well as lecture.

Laboratory experience in food processing courses is provided in a modern pilot plant which utilizes industry-size equipment. Some pieces of the laboratory equipment have been gifts of industry. In addition to actual pro-

(Continued on next page)

Glenn H. Olmstead

Glenn H. Olmstead is Chairman of the Mathematics and Science Division, State University of New York Agricultural and Technical College, Morrisville, New York.

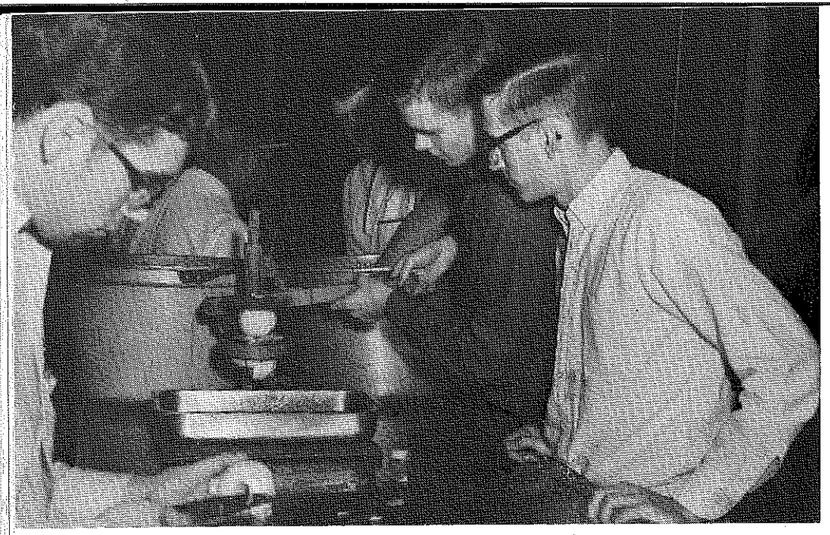
List of Courses
Food Processing Curriculum

FIRST YEAR

First Semester	Second Semester
Language and Composition	Literature and Composition
Microbiology	Food Microbiology
General Chemistry	General Chemistry
Mathematics	Mathematics
Food Preservation	Food Plant Layout and Organization

SECOND YEAR

First Semester	Second Semester
Social Science (elective)	Social Science (elective)
Food Plant Sanitation	Personnel Administration
Quality Control	Food Preservation (freezing)
Physical Education	Food Preservation (dehydration, formulation, preserving)
Food Processing Electives	Physical Education
	Electives



Students in food processing technology prepare apples for processing in the pilot plant operation. Students in food processing technology receive a strong background in the sciences related to food processing.

cessing work, students set up flow lines to study materials handling and sanitation work.

Students

The College has graduated over 700 students in food processing since 1947. These graduates are working in a variety of jobs throughout the United States and in many foreign countries. One graduate was complimented via radio by astronaut Neil Armstrong on the moon-landing Apollo 11 voyage for the excellence of the specially prepared, specially processed beef stew. Others, not so widely recognized, have moved from the supervisory or middle management positions where they started to positions in top management.

It should be pointed out that problems do exist in the two-year food processing program. The most pressing is in the recruitment of students. It is no longer possible to rely solely on the efforts of the College's admissions counselors who are recruiting students for twenty-eight curriculums. Food processing department staff members visit a number of high schools and speak to service clubs and other organizations. Attractive literature describing the program is widely distributed. However, of particular significance is the trend toward industry cooperation with the College in recruiting students. In addition to recruiting help, more than twenty industry-sponsored scholarships make the food processing curriculum more attractive to high school students.

The demand for our graduates still far exceeds the supply. Solving this basic problem is the continuing job of the colleges and the industry they serve.

BOOK REVIEWS

GERALD R. FULLER, Special Editor
University of Vermont

BEEF CATTLE SCIENCE by M. E. Ensminger, Danville, Illinois: The Interstate Printers and Publishers, Inc., 1968. (Fourth Edition), 1,020 pp. $10.75.

Beef Cattle Science is a modern beef production text. It covers all areas of beef cattle production. This book reflects the technological advancements and improved practices necessary for present-day beef production. It contains several new and revised sections which reflect the modernization process in the beef cattle industry. A new chapter has been added to cover the business aspects of beef production. This chapter (Chapter XIV) includes capital needs and sources, guidelines relative to facility and equipment costs, management, incentive bases for hired labor, budgets, computers, credit, co-op owned feedlots, custom (contract) feeding, how to analyze the cow-calf and cattle feedlot businesses, predicting what is ahead, beef futures trading, and income tax.

Revised sections of *Beef Cattle Science* include Section I of the appendix. This section includes the glossary and abbreviation of energy terms, NRC (nutrient to calorie ratio) nomenclature, feed term abbreviations, and more detailed data pertaining to the composition of feeds. Section IV, Comparison of Metric and Avoidupois Systems of Weights and Measures, is also an addition to the appendix. Chapter VI was revised to include hormonal control of estrus in cows. Chapter VIII was expanded to include how to balance a ration by the computer and methods of measuring energy. Chapter XII added a section which included a cattle feedlot disease and parasite control program and specific feedlot diseases and parasites. Chapter XIII was rewritten to include applied production technology and management to each system of beef production. A section on feedlot operation and management was added to this chapter.

Dr. Ensminger served for twenty-one years as chairman of the Animal Science Department, Washington State University. Prior to that he served on the staffs of University of Massachusetts, The University of Minnesota, and the U. S. Department of Agriculture. Currently, Dr. Ensminger is Distinguished Professor, Wisconsin State University. Dr. Ensminger is also the author of *Animal Science, The Stockman's Handbook, Sheep and Wool Science, Swine Science,* and *Horses and Horsemanship.*

Beef Cattle Science is an excellent text and reference for secondary, post-secondary, and college classes studying practical and scientific methods of beef cattle production. It is also recommended as a personal reference to agriculturists, cattlemen, and feedlot operators.

Keith E. Fiscus
Washington State University

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GRAIN STORAGE — THE ROLE OF FUNGI IN QUALITY LOSS by Clyde M. Christensen and Henry H. Kaufman. Minneapolis, Minn.: University of Minnesota Press, 1969, 153 pp, $6.50.

This book presents practical information in non-technical language about the causes and methods of preventing the deterioration of stored grains and seeds. The authors emphasize the role of fungi but information is also included on problems with insects, mites, and rodents.

The book will be of special interest to grain merchants and processors, elevator managers and operators, grain inspectors and others concerned with food processing.

Clyde M. Christensen is a Professor of Plant Pathology at the University of Minnesota. Henry H. Kaufman is the Manager of the Grain Research Laboratory of Cargill, Inc., Minneapolis, Minnesota.

This book is valuable to those mentioned above plus post-high school students studying the grain business or agri-business industry dealing with stored grain. High school seniors working in the stored grain industry or food processing also could profit from reading this book.

Leon Boucher
Ohio State University

★ ★ ★

From the Book Review Editor's Desk

EDUCATORS GUIDE TO FREE FILMS (29th Annual Edition). Randolph, Wisconsin: Educators Progress Service, 1969, 798 pp. $10.75.

Each school should make this publication available to its teachers. This edition contains 5,062 titles which include 785 new films. Many new films which may be procured from other agencies as rental films are available to users of this GUIDE without rental or service charges. A number of the films are appropriate for use in agricultural education.

EDUCATORS GUIDE TO FREE FILMSTRIPS (21st Edition). Randolph, Wisconsin: Educators Progress Service, 1969, 184 pp. $8.50.

One copy of this publication should be available to all teachers in a school. A total of 625 titles available from 98 sources are listed. Agricultural educators will find a number of useful filmstrips.

REFLECTIONS ON COMMUNITY DEVELOPMENT EDUCATION by Austin E. Bennett. Orono, Maine: PICS University of Maine, 62 pp. $1.00.

This is a publication of the Northeast Regional Extension Public Affairs Committee and was sponsored by The Farm Foundation. Content headings include: Educator or Revolutionist?; Human Factors Influencing Community Development; The Practice of Community Development; Role of the Educator; The Problem-Solving Process; Diagnosis and Evaluation of Community Development; Growth of the Community Development Educator; and Annotated Bibliography. "Staff and members of all groups concerned with community resource development should find this publication especially useful."

THE RISE OF AMERICAN COOPERATIVE ENTERPRISE: 1620-1920 by Joseph G. Knapp, Danville, Illinois: The Interstate Printers and Publishers, 1969, 532 pp. $8.95.

The publisher describes the book "unique in that it shows how cooperatives took root and expanded as this country grew from primitive colonial conditions until it was a great industrial nation. The story is told in a practical, interesting way, with all reference notes segregated at the end of the volume so as not to impede the thought of the general reader. The book is well indexed so that it will serve as a reference handbook on cooperative development in the United States." Teachers who include instruction on cooperatives in their courses will find this book a useful addition to their departmental library.

News and Views of NVATA

JAMES WALL
Executive Secretary

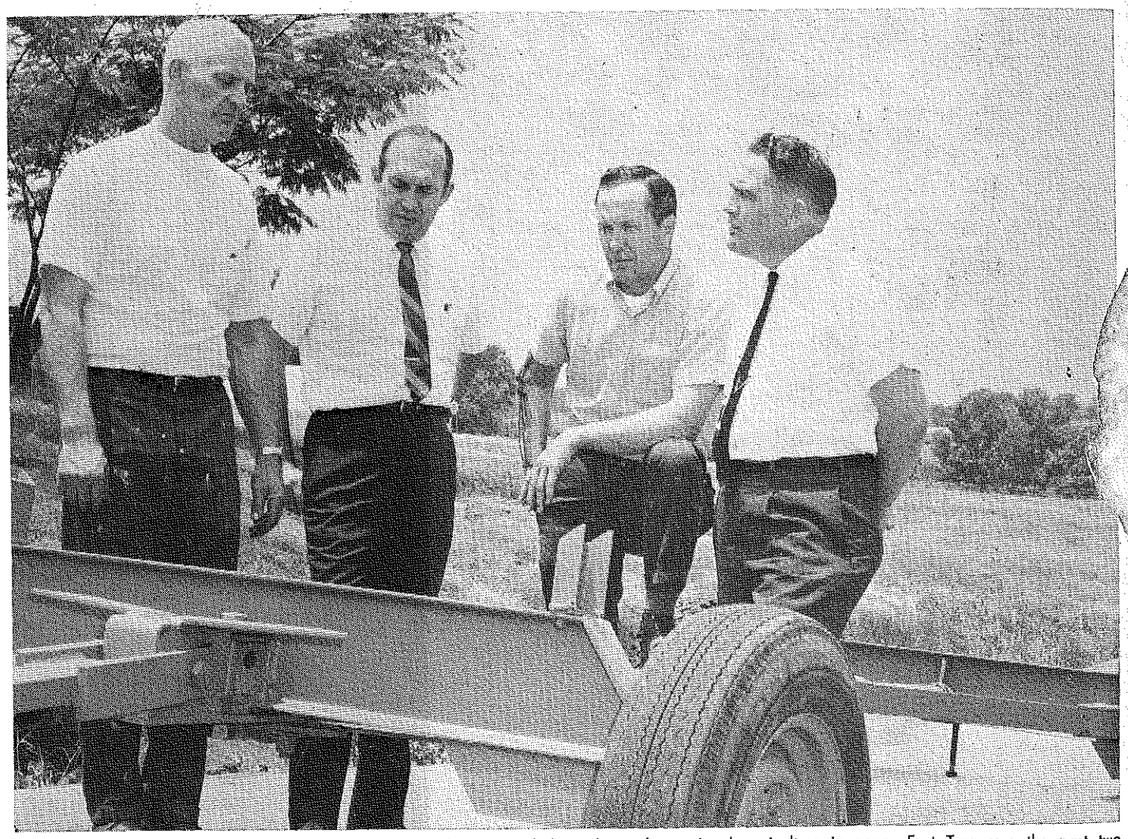
Following are some recommendations made by the Executive Secretary of NVATA at the Twenty-First Annual Convention in Boston, December 1969.

- A continued effort needs to be made to re-establish identification and adequate staffing for vocational agriculture and the FFA by the U.S. Office of Education.
- With reference to vocational agriculture and the FFA being eliminated by administrative decisions at the National level, it is imperative that NVATA and the affiliated state associations exert every possible effort to keep the same thing from happening at the state level.
- While membership is at an all-time high and twenty-one state associations reported 100 percent membership, a continued emphasis needs to be made on the importance of supporting NVATA and the other professional organizations. State associations are again urged to make a place in their organization for the many new teachers in the post-high school programs and other emerging programs in agricultural education.
- The Vocational Amendments of 1968 were written without reference to any of the various services. This is the crux of many of the problems and issues facing the profession today. The Executive Secretary strongly recommends that leaders of the various services be consulted by the AVA in drafting future legislation.
- There is ample evidence that other Divisions are just as unhappy with recent developments in the USOE as is the Agriculture Division. The Executive Secretary recommends that contacts be made with the leaders of the other Divisions to learn if they are interested in joining NVATA in their efforts to rectify the untenable situation that has developed in the USOE.
- Greater participation is needed in the various NVATA contests supported by commercial interests if it is desired that these events be continued. It should be the goal of every Region to have an entry in each event from each state.

Stories in Pictures

ROBERT W. WALKER
University of Illinois

Since 1953, FFA members in Minnesota have contributed over $200,000 to physically handicapped campers. The funds have been used to build a speech therapy building and greenhouses on the Camp Courage grounds. (Photo by W. J. Kortesmaki, Minnesota FFA Executive Secretary)



Inservice education in farm equipment construction has been provided teachers of vocational agriculture in upper East Tennessee the past two summers. Discussing a wagon made in the 1969 session are (left to right) Jesse Clonts, Vocational Agriculture Teacher of Troy, Missouri, who taught the course; Henry G. Williams, West Tennessee Supervisor of Vocational Agriculture; Cecil Boring, East Tennessee Supervisor of Vocational Agriculture; and John D. Todd, Assistant Professor of Agricultural Education, University of Tennessee. (Photo by A. B. Foster)

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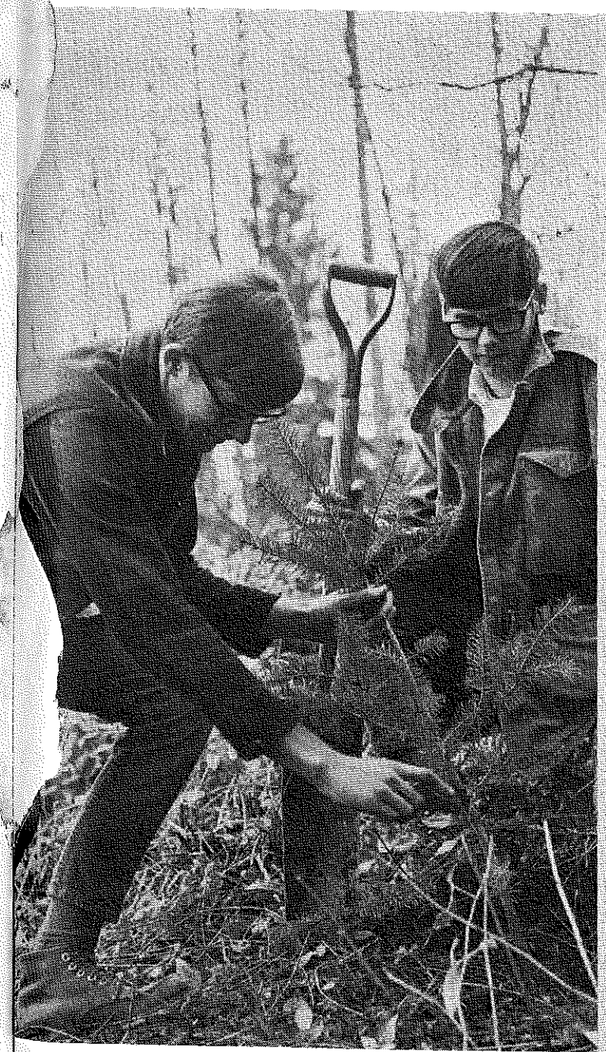

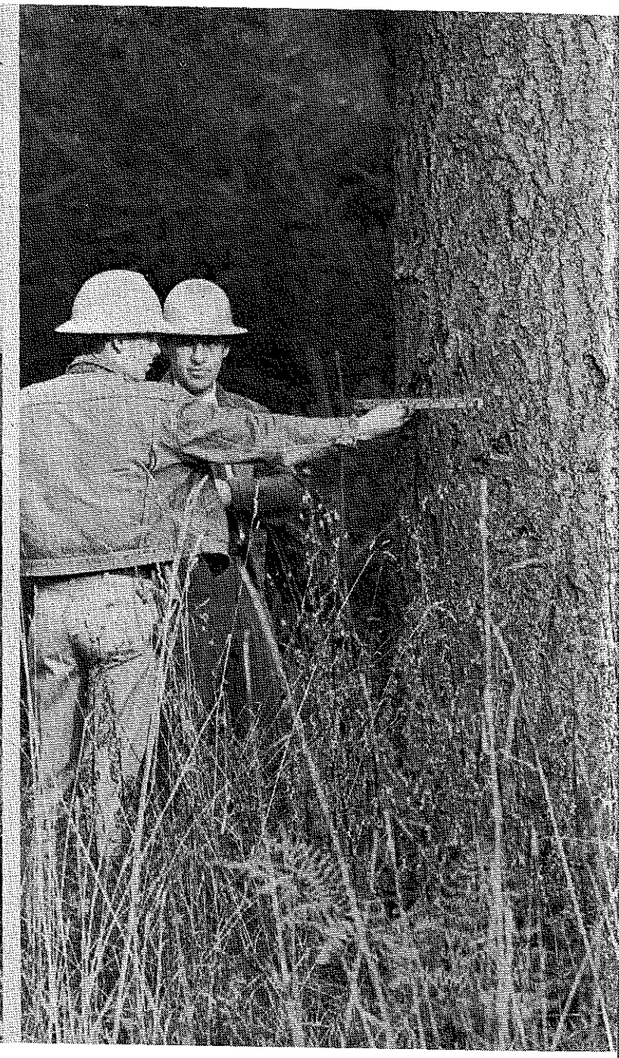

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