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NO. 10

COLLEGE OF AGRICULTURE.

SHORT WINTER COURSES



LEARNING HOW TO JUDGE A GOOD HORSE.

AGRICULTURE, DAIRYING, AND ANIMAL  
HUSBANDRY.

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LEONARD HASEMAN, A. B., *Assistant in Entomology.*

\*In the service of the U. S. Dept. of Agr.

†Absent on leave.

## COURSES OFFERED BY THE MISSOURI COLLEGE OF AGRICULTURE.

In addition to a four years' course of study embracing the essentials of Agriculture, Horticulture, Animal Husbandry, and Dairying, the College of Agriculture offers three distinct short courses, beginning January 4 1907

1. An eight weeks' course in Agriculture (Plant Production)
2. An eight weeks' course in Animal Husbandry
3. An eight weeks' course in Dairying

A Summer School course for teachers is also given every summer.

**Agricultural Education.**—No tendency of recent times is more significant than the general demand among farmers for a definite knowledge of the operations of the farm. It is well recognized by all progressive persons that success in farming as in other vocations comes as a result of clear, definite knowledge. This knowledge, the result of many careful experiments and the best experience of the most successful farmers, is acquired more easily and at less expense in an agricultural college than by long experience on a farm.

**History.**—The Missouri Agricultural College has successfully maintained courses of practical instruction for farmers, stockmen, dairymen, gardeners, and fruit growers for fourteen years. The attendance has grown steadily and the facilities for instruction have been rapidly improved. Twenty-five specialists now offer to our students the best know edge in every branch of farming, gardening, dairying, and stock growing.

**What the Short Winter Courses Aim to Do.**—Many young men desire to become better farmers, more skillful stockmen, stock judges, dairymen, or orchardists, but have not the time to take a four years' course of study. For these, the short courses are planned. The instruction is in everything practical, having in view especially the needs of men who must immediately turn to account the facts learned in the class room.



LATHROP HALL, ONE OF THE UNIVERSITY DORMITORIES

**Methods.**—In the short courses, much attention is devoted to laboratory instruction. The student learns by actual participation in agricultural operations. Practical exercises in identifying the varieties of farm crops, in judging animals, in propagating plants, in budding, grafting, planting, and pruning orchards, and in making butter and cheese are the means employed for illustrating and fixing in mind the instructions given in the class room.

**Expenses of the Course.**—No charge is made for tuition. The only charge is an incidental fee of \$5. A small laboratory deposit is required to cover cost of material and breakage in the laboratories. Good board and room, including fuel, light, furniture, care of rooms, and table board can be secured in Columbia at from \$3.50 to \$4 a week. Those wishing to do so may rent such rooms in the University Dormitories as may be vacant, at prices ranging from \$7.50 to \$13.00 each for the session of eight weeks. The University charges a fee of \$4.00 for a dining-room permit. The charges for table board and washing usually amount to \$1.75 or \$2 a week. An initiation fee of \$1 is also required by the club, for wear of dining-room equipment. The entire expense for any one course, excluding cost of travel, need not exceed \$50. Many students expend not over \$40 during the term.

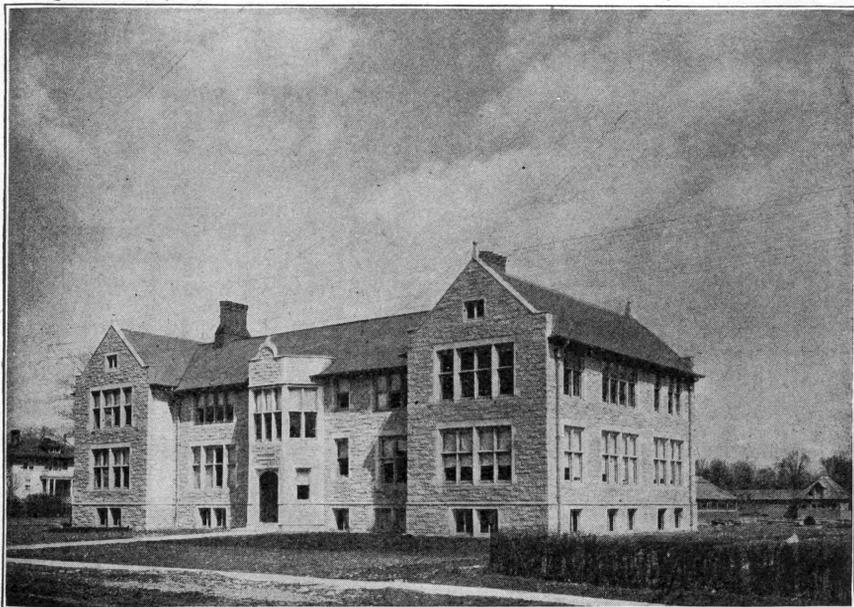
**Admission.**—No examinations are required for entrance to these short courses. Any person over sixteen years of age may enroll and enjoy the full privileges of the instruction. Many students have tak-

en courses to become better acquainted with the work of the Agricultural College and have later taken the long course.

**Managers Wanted.**—Each year the College has numerous requests for young men properly trained to take charge of stock farms, dairies, creameries, and orchard plantings. Thus far the supply of men with the proper training has not been equal to the demand.

**(A) Course in Agriculture (Plant Production).**

**I. Soils.**—The classification and distribution of soils, their physical properties, methods of cultivation and handling, soil fertility and



HORTICULTURAL HALL.

methods of increasing or maintaining it, the care and use of farm manures, the relative values of different commercial fertilizers and methods of application, the use of green manuring crops in general farm practice. Professor Miller and Mr. Grantham.

**II. Field Crops.**—The conditions affecting seed germination and plant growth, the judging of corn, wheat, and oats, the study of varieties suited to various Missouri conditions. The cultivation, care, and handling of farm crops, methods of rotation and farm practice

the production of promising special crops, such as alfalfa, cowpeas, and soy beans. The College Farm and Experiment Station fields offer opportunity for observing experiments and demonstrations in the production of field crops.

**III. Horticulture.**—By Professor Whitten, Mr. Howard, and Mr. Chandler.

**Propagation** of fruit trees, vines, and berry plants by means of grafting, budding, layering, cuttings, seeds, etc., and the determination of what constitutes good stock for planting in the orchard or berry field.

**Soil and Location** of the fruit plantation, how to select the proper soil for fruits, the significance of the slopes and elevations, water and atmospheric drainage, proximity to markets, facilities for transportation, etc.

**Planting** fruit trees and berries, laying out the plantation, distance apart to set the plants, time and manner of planting, etc.

**Tillage** of fruit lands; preparation of the soil for planting; cultivation of orchards and berry plantations; crops that may be grown in an orchard; relation of mulching and soil management to the conservation of moisture, the ripening of the wood in autumn, fruitfulness and the general development of the trees.

**Pruning and general management** of fruit trees, vines, etc., at the time of setting in the plantation and throughout their subse-



A PRACTICAL LESSON IN PRUNING TREES.



A PRACTICAL LESSON IN FRUIT GROWING.

quent development; season for pruning, relation of pruning to fruitfulness and to wood growth, climatic conditions, etc.

**Picking, Packing, Storing and Marketing** different fruits.

**Varieties** of different fruits for market and for home use and their adaptation to various soils and locations.

**Vegetable Growing.**—The planting, cultivation, and management of garden vegetables; construction, management and use of hot beds, and cold frames; transplanting, etc.

**Planting Home Grounds.**—Laying out grounds; making drives and walks, planting, pruning, and management of the more desirable shade trees, shrubs, etc.

**IV. Botany.**—This course consists of lectures and demonstrations relating to such important fungous diseases of cultivated plants as rusts, blights, cankers, mildews, etc. Specific preventive treatments will be discussed in connection with each disease. A few demonstrations will also be made illustrating some of the fundamental principles of plant nutrition, and in addition, a brief discussion of the Physiology of variation and crossing, with special reference to the development of the hardier plants or those better adapted to the conditions under which they must grow. Professor Duggar.

**V. Economic Entomology.**—These lectures treat of the insects that are injurious to fruit, farm, and garden crops, and to farm animals; and describe the habits and life histories of such insects and the best methods of combating them. Professor Stedman.

**(B) Courses in Animal Husbandry.**

**I. Principles of Feeding.**—The composition and digestibility of feeding stuffs; the preservation and preparation of coarse fodders; hay making; ensilage; grinding, steaming, and cooking food; feeding standards and the calculation of rations; growth and fattening; feeding for meat, milk, wool, etc.; effect of feeding upon quality of meat, wool, milk, and butter. Practice in computing and compounding rations for various purposes. Assistant Professor Forbes.



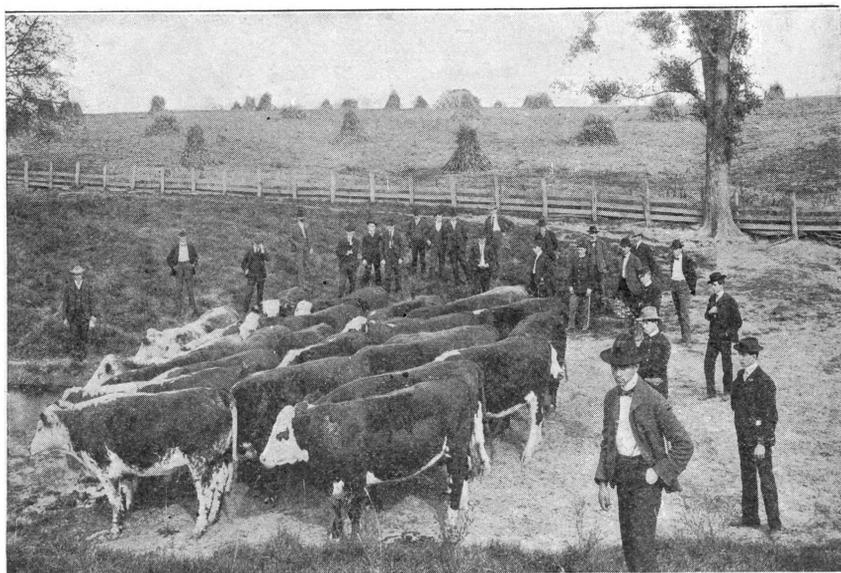
A LESSON IN GRAFTING FRUITS.

**II. Forage Crops.**—The production and utilization of the most important forage crops for the stock farm. This course will include the subject of silage and silo building as related to conditions in Missouri. Dean Waters.

**III. Animal Breeding.**—The principles of breeding, heredity, variation, and selection. The methods of breeding, grading, in-breeding, cross-breeding, pure breeding, and line breeding. Special prob-



lems such as the influence of environment, of fecundity, influence of previous impregnation; the possibility of controlling the sex of the offspring, etc., are considered in their relations to the operations of the stock breeder. Professor Mumford.



JUDGING FAT CATTLE.

**IV. Stock Judging.**—Practical work at the barns in judging cattle, horses, sheep, and swine. A carefully prepared score card is used to develop the student's powers of observation and to fix in his mind the best types. The farm is now supplied with choice animals of the Shorthorn, Aberdeen Angus, and Hereford breeds, representing the best beef types, and with well selected herds of Jerseys, and Holsteins of typical dairy form. Representative specimens of Shropshire, Hampshire, and Delaine Merino sheep supply material for thorough work in judging breeds of sheep. Eighty head of high class feeding cattle are used in these exercises. Excursions are made to successful cattle feeding and breeding establishments and to noted stock farms. Mr. Hechler and Mr. Trowbridge.

**V. Beef Production.**—A discussion of practical methods of beef production, including a consideration of successful practices in feeding for market, fitting for show, and general care and management of beef cattle. Dean Waters.



AN INTERESTING LESSON FOR HORSEMEN.

**VI. Sheep Production.**—Best systems of sheep husbandry; rearing for mutton and wool; production of spring lambs, fattening sheep and lambs for the market; general care and management of the breeding flock. Professor Mumford.

**VII. Pork Production.**—The feeding of hogs for market; the management of the breeding herd, and the study of foodstuffs, with reference to their adaptability to pork production. Assistant Professor Forbes.

**VIII. Breeds of Live Stock.**—A study of the history and development of the leading breeds of the domestic animals. Mr. Hechler.

**IX. Horse Production.**—The profitable production of market types of horses; the care and management of breeding animals, with some attention to training and development of market horses. Mr. Trowbridge.

**X. Veterinary Science.**—The aim of this course is to enable the students to prevent in a large measure those diseases of animals that result from improper feeding and handling and from lack of proper sanitary conditions. Students are taught also to treat in a rational way simple internal ailments and to perform with some skill easy surgical operations.

The following outline shows the subjects considered: The elementary Anatomy, Physiology, and Hygiene of domestic animals; examination for soundness; determination of age; common diseases of the internal organs, such as colic, indigestion, constipation, diarrhoea, inflammation of lungs and trachea, retention of urine, inflammation of udder, etc.; surgical diseases: like sprains, spavin, curbs, nail pricks in foot, barbwire cuts, fistula, bad teeth, etc.; instruction in castration, spaying, and caponizing; contagious, infectious, and parasitic diseases: such as strangles, glanders, black-leg tuberculosis, anthrax, hog cholera, stomach and intestinal, parasites, trichina, lung worms, scab, lice, etc.



A VALUABLE LESSON FOR CATTLEMEN—INOCULATING FOR BLACK-LEG.

The lectures are illustrated by charts, models, and preserved specimens of diseased tissue. Dr. Tiffany.

**XI. Veterinary Clinics.**—Each Saturday afternoon surgical operations are performed and diseased animals are treated before the whole class. Simple operations are often performed by the students themselves. Dr. Tiffany.



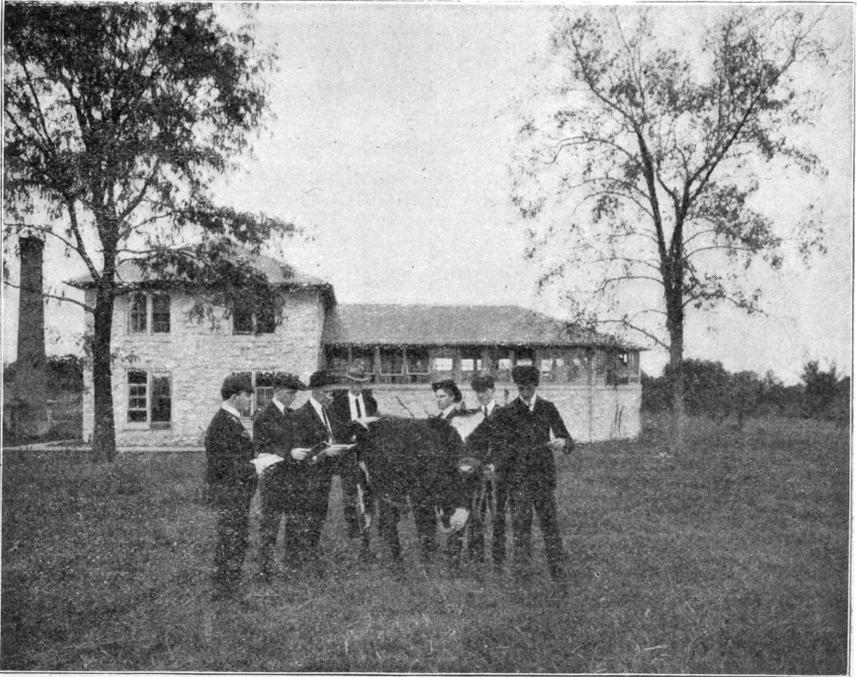
LEARNING TO TREAT DISEASED ANIMALS.

**XII. Poultry Farming.**—Special instruction is given in Poultry Farming by one of the leading Poultry experts of the United States. All students in the Animal Husbandry course will devote most of their time for one week to this important subject. Instruction in the breeding, feeding, judging, and marketing of poultry is given with special reference to Missouri conditions.

**(C) Courses in Dairying.**

Professor C. H. ECKLES, Mr. WAYMAN, and State Dairy Commissioner Hon. R. M. WASHBURN.

In no division of Agriculture does success depend more upon intelligence and skill than in Dairying. Combined with high quality must always be economy in cost of production. The dairyman or factory operator must familiarize himself with improved methods and modern machinery.



A GOOD TYPE OF FEEDING STEER IS THE SUBJECT OF THIS LESSON.

**Equipment.**—Our Dairy Laboratory is a two-story stone structure, 143 feet long by 43 feet wide. The receiving room, creamery, cheese manufacturing room, farm dairy, pasteurizing room, store room and refrigerator, are on the first floor. The cheese curing room is in the basement. The library, office, lecture room, milk testing laboratory, and Laboratory of Dairy Bacteriology are on the second floor.

The creamery room, 40 by 40 feet, contains receiving vats, milk heater, belt and turbine separators, cream vats, two combined churns and workers, cream pasteurizers, and other apparatus used in a modern creamery. Milk and cream are received each day from farmers and all the usual operations of separating and making butter are carried on by the students.

The farm dairy has such machinery as would be used in a modern home dairy. It contains eight farm separators of different styles, small churns of various kinds, and other apparatus needed in a model home dairy.

The cheese room has six vats for students' use, two modern

presses, curd mills, rennet tests, and such apparatus as is used in a cheese factory.

The testing laboratory is supplied with eight Babcock testers, both hand and turbine, and with testing apparatus of every kind used in dairy work.

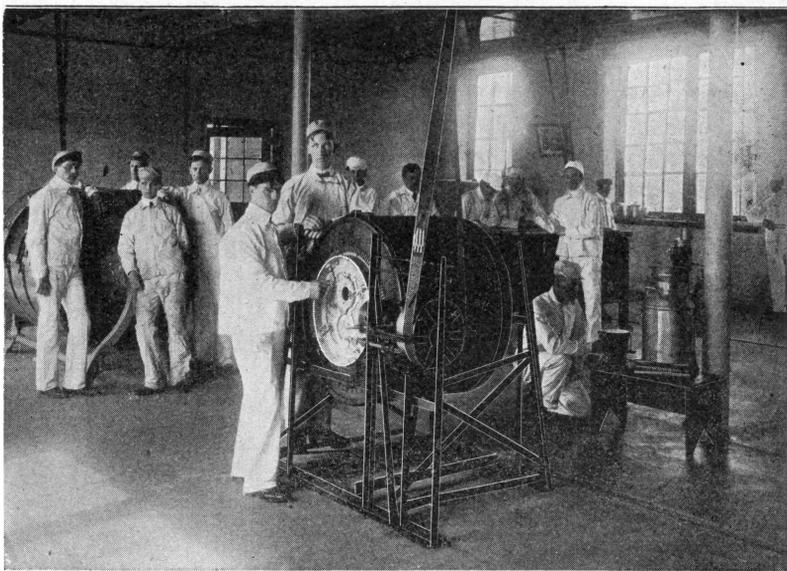
**The Dairy Herd.**—The Agricultural College has an excellent herd of dairy cattle consisting of about seventy registered animals of the Jersey, Holstein, and Ayrshire breeds.

These animals are used for judging and for studying types of dairy cows.

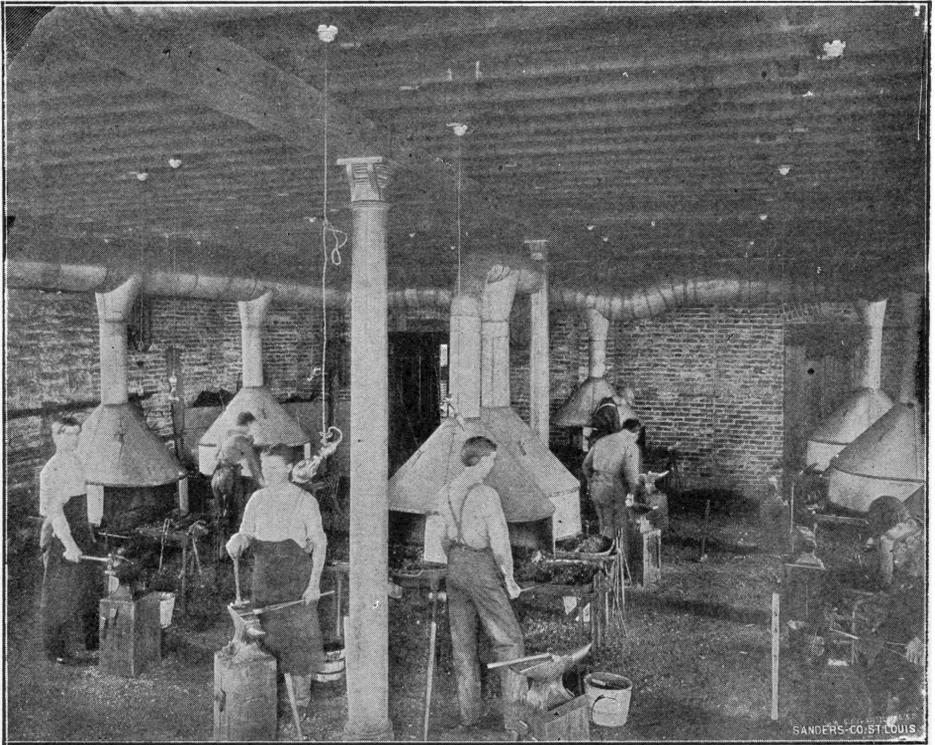
Complete individual milk and butter records have been kept for about ten years which give valuable material for class illustrations.

In arranging the plan of instruction the needs of three classes of students are kept in mind:

**First.**—Those who expect to be farmers and who will produce more or less milk for home consumption or for sale. These desire to learn how to handle the cows that milk may be produced economically and the product cared for properly. Such students should register in the Plant Production or Animal Husbandry Courses and elect the course in Milk Production from the Dairy course.



STUDENTS MAKING BUTTER.



LEARNING SIMPLE FARM BLACKSMITHING.

**Second.**—Those who expect to make dairy work, as operation of creameries, cream or milk stations, city milk plants, or large private dairies, their permanent business. They should register in the Dairy Course and take all the lectures and practical work in this course.

**Third.**—Those who wish to learn the principles and practice of cheesemaking. Instruction in this line will begin January 14th and continue four weeks.

**Dairy Practice.**—In the forenoon all students attend lectures; in the afternoon they have practical work. Those taking Milk Production only, spend one afternoon a week testing milk and cream, running separators and making butter. Those taking cheese making do all the work connected with practical cheese making. Those taking the entire Dairy Course do all kinds of work necessary in a fac-

tory, such as weighing and sampling cream and milk, pasteurizing cream, ripening cream with and without starters, churning and working, packing and printing for market.

**Butter Making.**—Lectures on the nature and composition of milk and dairy products; the theory of centrifugal separation and the construction of various separators; the principles of cream ripening, churning, and preparation of butter for market.

**Milk Testing.**—A thorough study of the Babcock test for milk, cream, and cheese; the test for acidity of cream; the use of the lactometer for detecting adulterations and making tests of individual cows

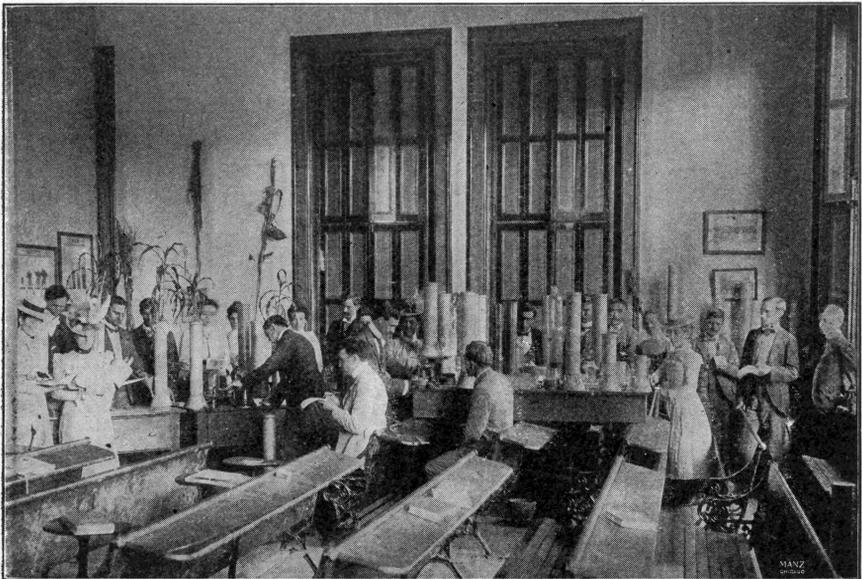
**Dairy Bacteriology.**—This course consists of lectures with numerous experiments on the nature of bacteria, their distribution, the conditions necessary for their growth, the relation of various common



AT WORK IN THE GREENHOUSE. A LESSON IN MARKET GARDENING.

kinds of bacteria to milk, the means by which milk becomes contaminated, and the relation of various fermentations to butter and cheese making. Starters and cream ripening are considered in detail.

**Milk Production.**—Special attention is given to economical production of milk. Lectures are given on the common breeds of dairy cattle, their origin, characteristics, dairy qualities, and points of excellence. Emphasis is placed upon selection of individual cows and in this work use is made of the College Herd of registered Jerseys, Holsteins, and Ayrshires. The proper care and handling of the dairy animal from birth is taught.



A CLASS-ROOM AS IT APPEARS AT RECITATION HOURS.

Feeding for milk production is taught by lectures and demonstrations at the dairy barn.

A study is also made of the composition of various feeds and their adaptability for milk production.

**Cheese Making.**—Instruction will be given in cheese making beginning January 14th and lasting four weeks. The time will be devoted mostly to actual practice in making cheese. Sufficient lectures will be given to fully explain the subject. Students taking this work

will also have opportunity to attend other dairy lectures and will be instructed in testing milk for fat and detecting adulterations and in the proper methods of caring for milk.

**Dairy Suits.**—Each student will provide himself with at least two white cotton suits. These may be purchased in Columbia at one dollar per suit.

**Other Courses in Dairying.**—Instruction in dairying is given throughout the school year in the four years' course in Agriculture.

**The Demand for Trained Men.**—The demand for men who are well trained in dairy work is far from being filled at any time. Every year the College has more applications for such men than it can supply. The demand is for men competent to take charge of creameries and cheese factories, or to manage dairy farms or city milk supply companies, or as herdsmen to take charge of pure bred herds. Applications have been made to the College during the present year for men in all these lines. In view of the rapid development of dairying in Missouri, this demand should increase rather than decrease in the future. The College does not guarantee positions to its students, but it assists them to find situations suited to their training and ability.

H. J. WATERS, Dean,  
Columbia,  
Missouri.

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