

HISTORICAL SUMMARY, PRESENT STATUS, AND FUTURE OBJECTIVES AND GOALS

DEPARTMENT DAIRY INDUSTRY

TEXAS TECHNOLOGICAL COLLEGE

HISTORICAL SUMMARY OF THE DEPARTMENT OF DAIRY INDUSTRY

Professor Kenneth M. Renner came to Texas Technological College in June 1927, and organized the Department of Dairy Products and Manufacturers as Associate Professor and Acting Head of the Department. The name was changed to the Department of Dairy Manufacturers in 1928, and Professor Renner was Head of the Department until his death September 2, 1947. Professor L. G. Harmon was made Acting Head until July 1948, when Dr. J. J. Willingham came to Texas Technological College as Professor and Head of the Department. The name was changed to Department of Dairy Industry January 23, 1954. Effective September 1, 1968, the name will be changed to Department of Dairy and Food Industry.

The Department has awarded 288 Bachelor of Science degrees and 20 Master of Science degrees. In addition, graduates of the Department have received 26 advanced degrees from other institutions: 12 Master of Science, 7 Doctor of Philosophy, 1 Doctor of Medicine, 1 Bachelor of Law, 1 Master of Business Administration, 2 Master of Education, 1 Doctor of Education, and 1 Doctor of Optometry.

The Department has offices, classrooms, and laboratories in the Agricultural Building and in addition has built and equipped, and presently maintains, the College Creamery.

INSTRUCTIONAL STAFF MEMBERS WITH RANK OF ASSISTANT PROFESSOR AND ABOVE

K. M. Renner, Associate Professor and Professor
 M. G. Pederson, Assistant Professor and Associate Professor
 L. G. Harmon, Associate Professor and Professor
 J. J. Willingham, Professor
 W. H. Tinney, Associate Professor
 K. M. Renner, Assistant Professor
 M. L. Peeples, Assistant Professor, Associate Professor, and Professor
 R. M. Miller, Assistant Professor
 E. R. Jarman, Assistant Professor

PUBLICATIONS OF FACULTY MEMBERS, DEPARTMENT OF DAIRY INDUSTRY

Professor K. M. Renner:

1. The Limit of Error of the Simplified Vacuum Solids Test as Applied to Ice Cream Mix, Evaporated and Sweetened Condensed Milk, L. G. Harmon, K. M. Renner, M. B. Harrison, and W. M. Slagle; Journal of Dairy Science, Vol. XXIV, July 1941, p. 265.
2. The Relationship of Cream Acidity to Mold Mycelia in Butter, H. H. Wilkoveke, K. M. Renner, J. Q. Sealy, and W. M. Slagle; Journal of Dairy Science, Vol. XXVI, March 1943, p. 283.

J. J. Willingham:

1. A Study of the Bacterial Counts at Five Stages of Milk Processing, J. T. Cardwell, J. J. Willingham, E. L. McBride, and Don A. Marshall; Proceedings, Southern Association of Agricultural Workers, 1950.
2. A Study of Various Ingredients Used in the Manufacture of Vegetable Fat Frozen Desserts; M. L. Peeples, J. J. Willingham, J. O. Ashworth, and Joe Dennis, Proceedings, Southern Association of Agricultural Workers, February, 1955.
3. A Study of Lipolytic and Proteolytic Spoilage in Cottage Cheese; M. P. Rhodes, L. G. Harmon, J. J. Willingham, and Archie Leonard; Journal of Dairy Science, Vol. 37, 1954, p. 637.
4. Standard Procedures for the Babcock Test for Milk, W. A. Cordes, J. E. Edmonson, T. I. Hedrick, E. R. Herreid, L. M. Lambert, J. J. Willingham, Burdet Heineman; Journal of Dairy Science, 37:761:1954.
5. The Effect of the Dairy Herd Ration upon the Susceptibility of Milk to Induced Hydrolytic Rancidity; W. B. Gilmore, J. J. Willingham, K. L. Neeley; Proceedings, Association Southern Agricultural Workers, Feb. 1968.
6. A Study of Selected Chemical and Physical Properties of High Solids Cultured Milks; John Jaynes, E. R. Jarman, J. J. Willingham, Proceedings Association of Southern Agricultural Workers, February, 1958.
7. The Influence of Rate and Temperature of Cooking on Acid Development in Making Cheddar Cheese from Pasteurized Milk; L. B. Barton, E. R. Jarman, J. J. Willingham, Journal of Dairy Science, 40:462:1957.

8. Survey of Dairy Products Judging Contests; C. J. Babcock, L. R. Dowd, E. L. Thomas, F. G. Warren, J. J. Willingham, G. M. Trout;

(1). What Vocations Do Dairy Products Judging Contestants Follow after Graduation?; Journal of Dairy Science, 41:1823:1958.

(2). What Salaries Do Dairy Products Judging Contestants Get after Graduation?; Journal of Dairy Science, 41:1826:1958.

(3). Dairy Industry Training in Retrospect; Journal of Dairy Science, 42:715:1959.

9. Rate of Inoculum of Cottage Cheese and Its Influence on Yield and Manufacturing Time; J. N. Morgan, J. J. Willingham, Roy L. Neeley, J. W. Bennett, and E. R. Jarman; Journal of Dairy Science, 43:438:1960.

10. Test for Predicting the Shelf-life of Cottage Cheese; M. L. Peeples, J. J. Willingham, Journal of Dairy Science, 45:287:1962

11. An Evaluation of the CVT Test for Prediction of the Shelf-life of Selected Dairy Products; J. D. Edwards, M. L. Peeples, J. J. Willingham, Journal of Dairy Science, 1966.

Articles:

1. Food for the Gods - Chocolate Ice Cream, Ice Cream Field, October, 1963.

2. Technical Questions and Answers, Ice Cream Field, April, 1964.

3. Technical Questions and Answers, Ice Cream Field, October, 1964.

4. Technical Questions and Answers, Ice Cream Field, March, 1965.

5. Is There a Place for the Small Manufacturer?, Ice Cream Field, September, 1965.

Contributing Editor to Ice Cream Field Magazine.

M. L. Peeples

1. Relationship of Surface Tension to Variations in Composition and Temperature of Fluid Milk Products; Journal of Dairy Science, 44:972:1961

2. Simplified Nusselts-Type Equation for Determining Some of the Heat Transfer Characteristics of Fluid Dairy Products; Journal of Dairy Science, 45:286:1962

3. Test for Predicting Shelf-life of Cottage Cheese; Journal of Dairy Science, 45:287:1962

4. Forced Convection Heat Transfer Characteristics of Fluid Milk Products. A Review, Journal Dairy Science, 45:297:1962.

5. Forced Convection Heat Transfer Characteristics of Fluid Milk Products. Journal Dairy Science, 45:303:1962.

6. Forced Convection Heat Transfer Characteristics of Fluid Milk Products during Cooling; Journal Dairy Science, 45:1456:1962

7. Simplified Nusselts-Type Equation for Describing Some of the Heat Transfer Characteristics of Fluid Dairy Products, Journal Dairy Science, 45:286:1962.

8. Values for the Heat Transfer Coefficients of Several Fluid Dairy Products; Journal Dairy Science, April, 1963.

9. Water Problems on the Dairy Farm, Sunbelt Dairyman, February, 1963.

10. Some of the Forced Convection Heat Transfer Characteristics of Condensed Milks, with R. J. Selman, Jr., Journal Dairy Science, 48:175:65.

11. A Simplified Method for Determining Sucrose Content of Frozen Desserts, Proceedings of Association of Agricultural Workers, 1965.

12. An Evaluation of the CVT Test for Prediction of the Shelf-life of Selected Dairy Products, with J. D. Edwards, Journal of Dairy Science, 1966.

13. Some Forced Convection Heat Transfer Characteristics of Ice Cream Mix. Journal of Dairy Science, 1966.

Articles:

1. Bacteria Can Break Your Back. The Sunbelt Dairyman, March, 1963

2. Rancid Milk Cuts Profits. The Sunbelt Dairyman, May, 1963

3. What Happens to Your Milk? The Sunbelt Dairyman, October, 1963

4. Butterfat - Effects of Management. The Sunbelt Dairyman, November, 1963

5. Mysteries of Milk. The Sunbelt Dairyman, January, 1964

6. Live and Let Live, with Pesticides. The Sunbelt Dairyman, May, 1964.

7. How to Treat for Mastitis. The Sunbelt Dairyman, October, 1964
8. Milk Ordinance and Code. The Sunbelt Dairyman, November, 1964
9. Training Young People in the Dairy Industry. The Sunbelt Dairyman, Dec., 1964.
10. Corrosion of Stainless Steel Equipment. Published by The Ohio State University, Department of Dairy Technology, Ext. Branch, 1959.
11. Types and Finishes of Stainless Steel. Published by The Ohio State University, Department of Dairy Technology, Ext. Branch, 1959
12. Some Rules of Thumb for Use in Considering the Efficiency of Dairy Plant Operations. Published by The Ohio State University, Department of Dairy Technology, Ext. Branch, 1959

R. M. Miller

1. The Development of a Jalapeno Pepper Flavored Pasteurized Processed Cheddar Cheese. Proceedings, Southern Association of Agricultural Workers, 1965.
2. The Effect of Monoglycerides on the Properties of Neufchatel and Creamed Cheese. Quarterly Bulletin of the Michigan Agricultural Experiment Station, Michigan State University, with C. M. Stine, and L. G. Harmon; Vol. 48, No. 2, p. 231-237; Nov. 1965.
3. Effect of Free Fatty Acids on Lactic Acid Production of a Streptococcus Lactis Culture; with H. L. Lewis, Proceedings Southern Association Agricultural Workers, 1968

DEPARTMENTAL ENROLIMENT SUMMARY

<u>YEAR</u>	<u>UNDERGRADUATE MAJORS</u>	<u>GRADUATES</u>
1958 - 59	43	2
1959 - 60	40	3
1960 - 61	26	2
1961 - 62	30	1
1962 - 63	23	3
1963 - 64	23	2
1964 - 65	19	3
1965 - 66	15	2
1966 - 67	21	2
1967 - 68	29	3

Enrollment in Elementary Course Dairy Industry 131 has increased from 125 in 1958 - 59 to 167 in 1967 - 68.

DEPARTMENTAL BUDGET SUMMARY

<u>YEAR</u>	<u>SALARIES</u>		<u>M. E. & T.</u>	<u>STUDENT ASSISTANTS</u>
	<u>Teaching</u>	<u>Non-Teaching</u>		
1958 - 59	\$ 18,300	\$ 3,000	\$ 1,810	\$ 500
1959 - 60	18,750	2,900	1,810	500
1960 - 61	21,233	3,000	2,000	500
1961 - 62	22,750	3,180	2,175	500
1962 - 63	25,450	3,180	2,400	600
1963 - 64	29,800	3,360	2,200	600
1964 - 65	31,100	3,540	2,200	600
1965 - 66	34,890	3,720	2,800	600
1966 - 67	36,355	3,900	2,800	600
1967 - 68	38,300	4,080	2,800	600

DEPARTMENTAL BUDGET SUMMARY - CREAMERY

<u>YEAR</u>	<u>SALARIES</u>	<u>LABOR</u>	<u>SUPPLIES & MATERIAL</u>	<u>EQUIPMENT</u>
1958 - 59	\$ 8,000	\$ 11,000	\$ 73,300	\$ 5,000
1959 - 60	10,450	12,000	68,300	8,500
1960 - 61	11,650	12,500	79,800	8,000
1961 - 62	13,077	12,200	82,000	10,000
1962 - 63	13,077	12,000	64,000	3,500
1963 - 64	10,142	12,000	64,000	2,000
1964 - 65	10,722	15,000	35,400	8,500
1965 - 66	11,443	15,000	34,000	12,000
1966 - 67	11,895	15,000	34,000	12,000
1967 - 68	13,753	17,500	44,000	12,400

SUMMARY CURRENT STATUS DEPARTMENT DAIRY INDUSTRY

During the 1967 - 68 academic year, the Departmental enrollment consisted of: 3 graduate students, 13 seniors, 6 juniors, 6 sophomores, and 3 freshmen. Enrollment in the elementary course was 167 students.

The Dairy Industry curriculum includes a fundamental course in the dairy and food industry for all Agricultural freshmen. The curriculum is designed to offer fundamental training in the science of the dairy and food industry. The technical courses in chemistry, bacteriology, testing, and the processing of milk and food products are designed to train the students for careers in the food industry. The graduates are prepared for college teaching and research, for industrial research with food plants, for superintendents and managers of all types of food operations, food products salesmen in the allied industries, technical control in food plants, for work in the regulatory field of state, local, national public health work. The curriculum permits electives to be taken in closely allied fields to prepare students for work in food plant office management, sales and advertising, and in field work for food organizations and food plants.

The College Creamery is operated as an education facility and is also operated on a commercial basis to the extent that the milk and ice cream for the College dormitories are processed in the College Creamery. The College Creamery is equipped with the latest equipment for processing milk and ice cream and has laboratory equipment for instruction in other phases of the dairy industry.

The present Dairy Industry faculty consists of the following:

Dr. J. J. Willingham, Professor and Chairman (12 months)	\$ 17,200
Dr. M. L. Peeples, Professor (9 mos. teaching, 3 mos. research)	17,333
Mr. R. M. Miller, Assistant Professor (9 months)	8,100

The Department is presently using the following space: three offices for faculty members, two small office spaces for graduate students, office and reception room for secretary, and a small reading room.

Class rooms being used are:

Agriculture 126	Seating capacity 72
Agriculture 115	Seating capacity 40
Agriculture 117	Seating capacity 18

Laboratory space available for undergraduate instruction and research:

Agriculture 228	30' x 40'	1,200 sq. ft.
Agriculture 230	30' x 40'	1,200 sq. ft.
Agriculture 231	25' x 30'	750 sq. ft.
(This laboratory is badly overcrowded)		
Agriculture 229	18' x 15'	270 sq. ft.
(Used for glassware and chemical storage)		

In addition to these facilities, the Department has the College Creamery, an annex building 60' x 120', that is operated as an educational facility and also processes milk and ice cream for the College dormitories. The Creamery is equipped with small scale commercial equipment for processing milk and ice cream and laboratory type equipment for cheese and processed cheese making, butter and condensed milk processing equipment. There are cold storage rooms for milk and ice cream, dry storage area, and a refrigeration room. These facilities are used for undergraduate and graduate instruction and for research. The commercial operation uses student labor, thus providing additional student training.

Each year the Department sponsors a Dairy and Food Industry Conference for the people in the industry of the state and surrounding region in hopes that the people in the industry can be kept abreast of the problems, the development, the research findings, and the new items of interest in the dairy and food industry. Speakers at the Conference are from other colleges and from the industry of the nation. The Department receives excellent cooperation from the state and national dairy groups and from the industrial companies in the dairy and food industry.

The Departmental budget for the present year includes:

Teaching salaries	\$ 38,300
Non-teaching	4,080
Maintenance, Travel, and Equipment	2,800
Student Assistants	600
Research	861

The College Creamery budget includes:

Salaries	\$ 13,753
Student labor	17,500
Supplies, Material and Maintenance	44,000
Equipment	12,400

SUMMARY OF GOALS AND OBJECTIVES IN THE DEPARTMENT OF DAIRY INDUSTRY

The world food situation is serious with the demand for more and better food products and the preservation of foods being currently produced to feed the rapidly increasing world population.

There is a present critical need for trained personnel in the food industry. Employment services report that the food industries should furnish the best opportunities for trained personnel during the next few years.

With the shift in emphasis in the Department from milk and dairy products to all food products, the demand for trained personnel to meet the critical world food problem, the enrollment in the Department can logically be expected to increase. It is expected that undergraduate enrollment will increase to a minimum of 50 - 60 students in five years and 80 - 90 students in ten years. Graduate enrollment should increase to 12 - 15 in five years and 20 - 25 in ten years.

At present, the Department has underway seven research investigations with graduate students and research projects. It is planned to expand this to at least 15 in five years and 25 in ten years.

Faculty Personnel Needs

At present, the Department is greatly in need of at least one faculty member to assist in undergraduate and graduate instruction and assist with research. At least one additional faculty member will be needed in the next five years, and a third member in the next ten years.

Space Needs

Office space for the faculty members will be needed as they are employed. Office space for three graduate students is needed immediately and additional offices will be needed as graduate enrollment increases.

At present, for proper student instruction and research, there is a great need for a minimum of two laboratory rooms, 30' x 40', properly equipped for teaching and research. In the next five years, a minimum addition of the

above space will be needed and in the second five year period, this much more additional laboratory space will be needed. The above laboratory space will be needed due to expanded enrollment.

Additional Plans and Goals

1. Interdepartment Cooperation.

At present, the Department is cooperating with Food and Nutrition in the School of Home Economics in student training and research. Plans are under discussion to expand this to Animal Industries, Agricultural Economics, Agricultural Education, Agricultural Engineering, Horticulture, and eventually to other departments.

2. Additional Courses.

With the increased demand for improved processing methods and food preservation methods, it is planned to institute courses that would be of service to other departments and other schools, Business Administration, Arts and Science, and Home Economics. These courses could eliminate the duplication efforts in the field of food industries.

3. Food Science Institute.

Cooperate with all departments and agencies interested in the food industry to set up a Food Science Institute on campus for public service, student instruction, and research investigation.

4. Additional Funds.

Requests are being made and more will be made in the future to secure grants from government agencies, industrial corporations, and private donors for money for research including faculty salary, supplement equipment and materials. These grants can be of great help in securing faculty, graduate students, and undergraduate students.

5. Recruitment Procedures.

An active and dynamic program is needed to acquaint prospective undergraduate and graduate students with the opportunities offered by a career in the food industry. These prospective students should be given information regarding prospective employment opportunities, salaries paid, and other benefits, necessary training, and other pertinent information.

A definite program is also needed for proper faculty recruitment so that the best qualified personnel may be obtained.

6. Enlarge and Improve Present Graduate and Research Program.

To improve and strengthen the present graduate and research program, lecture and laboratory courses are needed with increased graduate enrollment. Organized courses can be taught for graduate students and with additional laboratory facilities the research projects can be enlarged and increased for better student training and research.

7. Food Processing Facilities.

The present facilities in the College Creamery are fairly adequate for student training in milk and milk products, but additional facilities are and will be needed.

With the increased emphasis on all foods, there is a critical need for facilities for the processing and preservation of other foods. These facilities will require additional space.

The foundation of the present Creamery building, 60' x 120', was constructed to carry a second story. The addition of this second story would provide additional space for offices, laboratories, and processing rooms.

The faculty and staff of the Department of Dairy Industry plan, if funds, space, and equipment can be secured, to develop an outstanding facility for training students for the food industry and to serve the public interest of the region, the state, and contribute to the easing of the world food problem.