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The Research Laboratory  
of the  
Institute of American  
Meat Packers  
Founded by Thomas E. Wilson  
at The University of Chicago

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*A Co-operative Endeavor*  
*Between*  
*the University and the Institute*



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For more than ten years the American meat packing industry has enjoyed an affiliation accorded by The University of Chicago. Through this affiliation important educational and research activities benefiting that industry, its employees and the consumers of its products have been conducted.

In the Research Laboratory of the Institute of American Meat Packers, founded by Thomas E. Wilson, the application of science to certain problems of the packing industry has yielded helpful results that have had practical application in the daily operations of the industry. At the same time, the research results have provided valuable information for use in the home study courses in meat packing subjects offered by the Institute of Meat Packing, an educational unit in the School of Business administered jointly by The University and the Institute of American Meat Packers.

It is interesting to note that the Institute, through its affiliation with the University, has enabled a number of young men to do graduate work, and, in some instances, complete their doctorates.

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"If you teach a poor young man to shave himself and keep his razor in order," wrote Benjamin Franklin in his Autobiography, "you may contribute more to the happiness of his life than in giving him a thousand guineas."

Similarly, it is likely that anyone who can show the various members of a great American industry how to do their work more efficiently or how to produce a more valuable output of products and by-products can render an important service not only to that industry but to the greater circle of its consuming public.

As one of the most essential of all industries, the meat packing industry of the world has always had to be supremely practical. The hunters and herders and farmers that have shouldered the task of feeding humanity its meat for countless centuries have been too busy to have much time for theory; and if there was always a deplorable lack of meat in the hotter seasons, or if the product lost its value in the slow transit from farm to consumer, or if an almost total waste of by-product materials resulted, these were not the fault of the meat producer, but rather the results of the slowness with which the candlelight of science was moved ahead to light his way.

So it is not surprising that the packing industry in the United States was really a "packing" industry at first, which salted meat away in barrels for later use at other places or other seasons; or that less than a hundred years ago the early packers of the midwest were giving away, or dumping in the river, the hearts and livers and other products not desired for salting.



Even with the progress of meat curing and of lard-making and the beginning of the by-product industries in the half century preceding 1900, however, science had little or no place in the meat industry except when some primarily practical man happened to cross its trail unsuspectingly. And when in 1884 the first chemist entered the packing industry, he came not to supervise the curing of meats or the making of lard, but merely to analyze one form of lard because there was at that particular moment a lawsuit on the subject.

Since that date, however, the place of science in the packing plant has been advanced amazingly. Today the chemist not only supervises the strictly chemical processes of the plant, but also prescribes the rules of its operation from the standpoints of conservation and sanitation, and tests alike the quality of its supply purchases and the possibilities of its by-products. Waste has been reduced to a minimum, and by-products have attained such variety and total value that the packer is sometimes able to pass on to the farmer the entire amount received from the sale of the meat of the animal.

Along with the keenness of competition which has forced this rigid economy and utilization of every asset upon the industry, has come also a willingness to co-operate in matters of common concern. Thus there was originated in 1919 — as the successor of a still older group — the Institute of American Meat Packers, which collects and distributes market reports and other statistics of the industry, serves as a clearing house for plant and accounting practices, conducts scientific research, prepares and distributes publications and news announcements, and otherwise promotes the industry's welfare. It includes more than three hundred companies in its membership, and has offices in New York, Washington, San Francisco, Los Angeles, and Seattle, as well as its principal office in Chicago.

In 1925 the Research Laboratory of the Institute was founded at The University of Chicago through a grant of funds from Thomas E. Wilson, Chicago packer, who had been the first president of the Institute and was (and is)

chairman of the Institute Plan Commission. Its purpose is to study the problems presumably common to all packers, and to collect and distribute information which would seem to be of value to all. Some specific examples of its studies may be of interest:

In the field of spoilage prevention, it has studied and consequently recommended sodium hypochlorite as a sterilizing agent in the packing plant. This chemical was found to be a harmless but powerful sterilizing agent, peculiarly effective against molds as well as against bacteria; it is also a deodorant; and it is economical. Members of the Institute therefore have been informed not only of its value, but of its methods of preparation and of the proper dilutions for use for various purposes.

Then there was the problem of pigmentation. For example, at times and under certain conditions, the color of ham or bacon or other cured meats may fade, or, as in the case of sausages particularly, it may take on a greenish gray cast. Any color except pink, however, seems to reduce the salability of an otherwise desirable product. Accordingly, the Laboratory went to work to find the cause and the remedy for these green discolorations, which proved to be of bacterial origin. Thus the Laboratory was here able to show that vigilance in sanitation, speed in handling, accurate control of temperature, and the proper use of curing ingredients have an immediate cash value as well as a theoretical one.

In the case of color fading in hams, it was discovered that color deterioration may often be prevented simply by using a certain type of sugar in the curing process!

Prior to the work of the Institute on the question of the souring of hams, which sometimes rendered substantial quantities of product unsalable, such a souring was considered more or less a visitation of mysterious origin, from causes somehow beyond the control of the packer. The work of the Laboratory showed, however, that the prevention of this form of spoilage is primarily a matter of the quick and uniform chilling of pork, and of speed in getting it into cure.



One of the outstanding contributions of the Research Laboratory has been the promotion of the "sodium nitrite cure," which has permitted greater economy, efficiency, and purity of product in the choice of the curing ingredients that fix the color of the meat — thus producing the permanent pink of a ham, for example, which outlasts even the cooking process. Experiments in the direction of a milder cure also have resulted in greater economy. The average ham is submerged in a "pickle" of salt, sugar, and nitrite, requiring about three and a half days per pound of ham. This delay has naturally led to a study of the possibility of quicker cures without sacrifice of quality. While time is still an important factor in producing the flavor of cured meats, during the last two years there has been an average reduction of probably one-fifth in the curing time required.

For the past ten years, the Laboratory has constantly studied problems relating to lard. Among the specific accomplishments resulting is a caustic refining process which improves the quality of the lard. Similarly, the hydrogenation and deodorization of lard for certain purposes were studied and considerable information regarding them was distributed.

Exhaustive studies have been made regarding the cause of free fatty acids and their prevention, as well as the production or removal of color in lard. It has also been possible to study the factors which make for greater stability.

Methods of removing the natural greenish or bluish tints of lard without damaging its stability have been elaborated and a patent on the process has been applied for.

Finally, the Research Laboratory of the Institute has conducted an exhaustive study on the shortening value of lard. Some 40,000 shortometer tests were made, to determine the relative shortness of pie-crust prepared from different types of fats. Out of these tests came the conclusion, now generally accepted, that lard has 25% more shortening value than have the competing hydrogenated vegetable oils.

Since it was not generally thought that lard could be used in the making of cakes, however, a study of this problem also was made in the Laboratory; it revealed that excellent home cakes could be made with lard. At the present time the Laboratory is engaged in the extension of the use of lard into bakery or commercial cakes. In this work consumer acceptance tests have been made, and no conclusions have been drawn until a thousand persons have been supplied with the cakes, unlabeled, for their comparative judgment.

The cookery department of the Laboratory has brought forth many tested recipes also. These have been embodied in a booklet, "Good Things Made with Lard," which has had wide distribution.

Dr. W. Lee Lewis, former head of the chemistry department of Northwestern University, is Director of the Institute's Department of Scientific Research. Working under his direction at the Research Laboratory are Dr. F. C. Vibrans, chief chemist; Miss VeNona Swartz, home economist; and George Beach and D. A. Greenwood, chemists.

The services of Dr. Vibrans as a consultant in lard problems are now being offered to member packers, state by state. In this connection he has recently made visits to about twenty-five plants in six states.



Publications Issued by  
Department of Scientific Research

Date	Title
3/24/24	First Bulletin on Ham Souring
4/29/24	The Washing and Brining of Hides
6/ 2/24	The Better Utilization of Blood
6/17/24	Tuberculosis and the Packer
8/28/24	Second Bulletin on Ham Souring
11/ 7/24	The Cattle Grub
5/18/25	Prague Salt
7/15/25	Josef Mayer's Curing Salts
7/20/25	Third Bulletin on Ham Souring
10/ 7/25	Curing Results: Raisin Syrup and Cerelose
10/26/25	Preliminary Bulletin on Nitrite
1/14/26	The Use of Sodium Nitrite in Curing Meat
2/ 3/26	Sodium Nitrite Reprint from "Ind. Eng. Chem."
3/23/26	Hickory Smoked Salt
4/ 8/26	Sodium Nitrate in Pumping Pickle
4/24/26	Progress Report on Corrosion Studies
5/10/26	Leather Belting vs. Rubber Belting
5/26/26	Further Experiments with Curing Sugars
5/26/26	Cane and Beet Sugars in Curing
6/ 1/26	Nitrate in Pump Pickle
6/16/26	The Sampling, Analyzing, and Grading of Cured Hams
7/ 6/26	Proprietary Preparations
9/28/26	The Cause and Prevention of Slimes on Frankfurters
12/ 1/26	Anti-Freeze Solutions for Automobile Radiators
12/14/26	Ham Souring (Reprinted from National Provisioner)
12/29/26	Ozonizers
1/ 5/27	A Technical Article on Ham Souring (Bacteria in the Muscular Tissues and Blood of Apparently Normal Animals, by Allan Reith)
1/13/27	Reprint of News Item of U. S. Department of Agriculture
1/27/27	Second Report on Corrosion Studies
2/25/27	The Use of Sodium Nitrite in Curing (Government Reprint)
4/11/27	Bulletin on Sodium Hypochlorite
4/11/27	Testing of Twine and String

Date	Title
4/12/27	The Use of Sodium Hypochlorite in the Packing Plant (Second Bulletin)
8/15/27	Uniform Contract on Hide Sales
8/19/27	Gasoline
11/ 9/27	Second Bulletin on Proprietary Preparations
11/25/27	Marking Sodium Nitrite Containers
5/25/28	Use of Essential Oils in Flavoring
6/28/28	Correction in Bulletin 106-X
7/26/28	Soft Spots in Boiled Hams
8/ 6/28	Third Report on Corrosion Studies
1/14/29	Some Factors Affecting Color Fixation
2/ 5/29	Score Card for Uncooked Smoked Hams
2/ 5/29	Score Card for Commercial Boiled Hams
2/ 5/29	Score Card for Boiled Smoked Cured Hams
2/ 5/29	Score Card for Baked Cured Smoked Hams
2/ 5/29	Score Card for Fried Cured Smoked Hams
2/11/29	Summary Preceding Bulletin on "The Cause and Prevention of Molds"
7/ 8/29	Score Sheets for Testing Hams
8/ 9/29	The Cause and Prevention of Green Rings in Sausage
8/13/29	We Have Some Very Technical Data Your Chemist Might Like to Have
11/26/29	Studies on Lard to May, 1929 — No. 1
2/17/30	The Present Status of Our Knowledge of Ham Souring — IV.
4/23/30	Practical Methods in Corrosion Prevention
5/ 1/30	A Study of Methods for Determining Nitrite in Meat and Pickles
6/27/30	Results of Research Work on Lard (The Cautic Refining of Lard, Preliminary Report)
7/17/30	Reports on Corrosion (Abstracted from Reports of A. S. R. E. Corrosion Committee and Research)
8/ 1/30	A Study of Methods for Determining Nitrate in Meat and Pickles
10/28/30	Suggestions for Maintaining the Good Quality of Lard
12/24/30	Minimum Standards for Lard Studies on Clostridium Putrificum and Clostridium Putrefaciens
4/30/31	Some Observations on Curing
8/21/31	Anti-Oxidants in Edible Oil Preservation, by F. C. Vibrans



Date	Title
12/21/31	The Hydrogenation and Deodorization of Lard
6/ 8/32	Discolorations in Cured Meats, IV.
7/14/32	The Caustic Soda Refining of Lard (Second Bulletin)
3/13/33	Effect of Curing Operations on Curing Ingredients in Cured Meats
3/14/33	Apparatus for Testing Nitrite in Pickle
9/21/33	An Accelerated Stability Test for Edible Fats
11/20/33	The Good Qualities of Lard
1/17/34	The Quick Cure of Regular Smoked Hams
1/17/34	Proceedings of Chemistry Meetings at 1933 Convention
1/22/34	Shortening Value of Plastic Fats
6/ 1/34	New Viewpoint on Lard as Seen by One Packer
6/28/34	Latest Information on Lard Available in New Booklet for Home Economists, "Lard"
8/ 3/34	Report of Mrs. Cawood from Home Economics Convention in New York
8/ 4/34	Marking of Sodium Nitrite and Sodium Nitrate
8/13/34	Questions and Answers on Lard for Salesmen
8/17/34	Information on Merits of Lard
10/20/34	Frankfurters, the Baker's Friend
10/25/34	Lard, from Kettle to Cake
10/26/34	Shortening Value of Fats, II.
10/29/34	Questionnaires for Possible Use in Food Poisoning Cases
2/22/35	Information Requested Regarding Handling of Curing Material
4/18/35	Sausage — From Confucius to Columbus
5/17/35	What Causes Free Fatty Acids in Lard?
6/10/35	The Care of Idle Curing Containers
7/ 5/35	Lard Manufacture and Meat Canning Problems
7/11/35	How Is Your Lard?
7/12/35	Are Any Free Fatty Acids Formed in the Rendering Tank?
9/20/35	The Value of Lard as a Shortening Agent
10/ 1/35	Moisture in Sausage
11/ 8/35	Recipe Booklet, "Good Things Made with Lard"
11/15/35	Rapid Factory Method for Determination of Free Fatty Acids in Greases
2/19/36	Why Sterilize?
3/13/36	Questions and Answers on Manufacturing Problems of Packing Industry (Chemical Section Proceedings, 1935 Convention)

Date	Title
6/ 2/36	Counsel on Lard-Making—State of Illinois
6/12/36	Follow-up on Special Bulletin No. 27, State of Illinois
6/12/36	Counsel on Lard-Making—State of Indiana
6/13/36	The Place of Sugar in Curing Meat
6/30/36	Counsel on Lard-Making — State of Ohio
6/30/36	Counsel on Lard-Making — State of Missouri
7/16/36	Counsel on Lard-Making—State of Kentucky
7/23/36	Concerning the Use of Nitrite of Soda and Nitrates
7/31/36	The Development of Free Fatty Acids in Hams and Back Fat During Cure
8/11/36	Counsel on Lard-Making—State of Pennsylvania
8/18/36	Letter to Members Who Requested Material on Nitrite
8/19/36	The Effect of Free Fatty Acids on the Smoking Temperatures of Lard
8/21/36	Oligodynamics
8/28/36	Storage Battery Compounds and Solutions
11/ 5/36	Counsel on Lard Making—State of New York