

~~100-1677~~

MEAT HYGIENE

James A. Libby

Fourth Edition



MEAT HYGIENE

James A. Libby, D.V.M., M.Sc.

*College of Veterinary Medicine
University of Minnesota
St. Paul, Minnesota*

Fourth Edition



LEA & FEBIGER

Philadelphia

1975

**Library of Congress Cataloging in
Publication Data**

Libby, James A.
Meat hygiene.

Third ed. (1966) written by P. J. Brandly,
G. Migaki, and K. E. Taylor.

1. Meat inspection. 2. Meat inspection—
United States. I. Brandly, Paul J. Meat
hygiene. II. Title. [DNLM: 1. Meat—
Packing industry. WA707 L694m 1974]
TS1975.L46 1974 614.3'1 73-14959
ISBN 0-8121-0466-8

Copyright © 1975 by Lea & Febiger. Copy-
right under the International Copyright
Union. All Rights Reserved. This book is
protected by copyright. No part of it may be
reproduced in any manner or by any means
without written permission of the publisher.

PRINTED IN THE UNITED STATES OF AMERICA

Preface

On behalf of the many new contributors, it is my pleasure to present the fourth edition of this textbook. Since it is the only major text on meat hygiene printed in the United States, I felt this should cover the total field rather than concentrate on a few selected areas. At the same time, it should be in depth on the subjects commonly faced by the veterinarian and the meat inspector who apply the principles of meat hygiene on a day-to-day basis.

The first two editions were written and edited by Dr. A. R. Miller, former director of the Federal Meat Inspection Service. Over the past months, I have gained a tremendous respect for the monumental task Dr. Miller accomplished in assimilating a meat hygiene book for the first time in the U.S.

The third edition was published in 1966 and was edited by three of Dr. Miller's former students. These were Drs. George Migaki, Paul Brandly, and Kenneth Taylor. The tremendous job accomplished by these three in bringing new information together and expanding the book into new areas is an indication of how several contributors can be an added value. I strongly admire and want to give credit for the fine job done by Dr. Miller as well as the editors of the third edition.

In the fourth edition, the idea of multiple contributors was expanded. A total of eleven new people, including the editor, combined efforts to bring together the most modern meat hygiene information known today. Each contributor was allowed to use any of the still current information from previous editions. In some areas new in-

formation was minimal but in others it was substantial. Several chapters were completely rewritten and some are brand new. Each contributor was encouraged to keep the reader in mind. This was an attempt to present information in an applied sense whenever possible rather than being strictly academic. This resulted in the history section of each chapter being shortened significantly.

Since the third edition was published, the WMA of 1967 and the WPPA of 1968 have been passed and put into effect. The tremendous effect these laws have had on the meat industry and inspection agencies will be felt for a long time. Thousands of plants are now under inspection for the first time and inspectors are working in many plants owned, serviced and operated by one person.

Chapter 1—History—now includes the steps leading to passage and the significant aspects of these new acts. The Curtis Amendment to the WMA covering custom/exempt plants is also discussed.

Chapter 7—Trichinosis—is completely revised and evaluates the possible methods of control in some depth. Current prevalence studies in swine and wildlife reservoirs are also discussed.

Chapter 8—Comparative Anatomy of Meat Animals—and Chapter 9—Chemistry of Muscle and Major Organs—are completely new. This information should help the veterinarian and meat inspector in understanding new technology and processing techniques applied by industry. Chapter 13—Facilities and Procedures Relating to Sanitation in Plant Operation—now includes a discussion of

pollution control aspects of the meat industry as well as public health aspects of a water supply. The search for new sources of protein has led to the addition of items such as soy protein to meat. Chapter 15—Meat Additives—covers the materials which are allowed to be added to meat and how they are controlled. The carcinogenic substances known as nitrosamines are discussed in relation to control of nitrites and nitrates added to meat products.

The increased sophistication of laboratory equipment has provided for the possible detection of chemicals in meat products when only present in extremely minute amounts. This has led to some feed additives, some insecticides and certain antibiotics no longer being allowed for use in food producing animals. Chapter 16—Toxic Residues That May Occur in Meat—goes into the legal aspect and significance of the control of these chemicals in regard to the public health.

Chapter 17—Exposure to Ionizing Radiation—has been completely rewritten to include a discussion of the effects of radiation on livestock and the approach to be used by the veterinary meat inspector in assuring consumer safety in case of radiation contamination of meat products. Chapter 19—Meat Grading—has been expanded to include a more comprehensive coverage of Federal meat grades for the various species.

Credit is deserved by many government agencies, meat packing companies, equipment companies, college faculty members and meat inspection personnel for the fine assistance given to the contributors and myself in putting the fourth edition together. Particular mention should go to many personnel of the U.S.D.A. who acted as resource people and were helpful in providing materials whenever asked.

St. Paul, Minnesota

JAMES A. LIBBY

Contributors

Joseph L. Blair, D.V.M.
Meat and Poultry Inspection Program
U.S. Dept. of Agriculture
Washington, D.C.

Richard J. Epley, Ph.D.
Institute of Agriculture
University of Minnesota
St. Paul, Minnesota

Melvin L. Hamre, Ph.D.
Department of Animal Science
University of Minnesota
St. Paul, Minnesota

Lois E. Hinson, D.V.M.
Veterinary Services
U.S. Department of Agriculture
Washington, D.C.

M. R. Humphreys, D.V.M.
Meat and Poultry Inspection Program
U.S. Department of Agriculture
Washington, D.C.

William E. Jennings, D.V.M.
Professor Emeritus
Auburn University
Santa Rosa Beach, Florida

James D. Lane, D.V.M., M.S.
Meat and Poultry Inspection Program
U.S. Department of Agriculture
Albany, New York

James A. Libby, D.V.M., M.Sc.
College of Veterinary Medicine
University of Minnesota
St. Paul, Minnesota

Herbert W. Ockerman, Ph.D.
Animal Science Department
The Ohio State University
Columbus, Ohio

John Spaulding, D.V.M., M.Sc.
Meat and Poultry Inspection Program
U.S. Department of Agriculture
Washington, D.C.

J. D. Willis, D.V.M.
Meat and Poultry Inspection Program
U.S. Department of Agriculture
Atlanta, Georgia

William J. Zimmerman, Ph.D.
Veterinary Medical Research Institute
Iowa State University
Ames, Iowa

Contents

Chapter 1	History	1
	<i>James A. Libby</i>	
	Poultry	8
	Improved Legislation Needed	10
	Steps Leading to New Legislation	11
	Major Provisions of the Wholesome Meat Act	13
	Wholesome Poultry Products Act of 1968	14
	Curtis Amendment	14
Chapter 2	Elements and Controls of Meat Hygiene	16
	<i>Joseph L. Blair</i>	
	Sanitation	16
	Ante-Mortem Inspection	18
	Post-Mortem Inspection	19
	Reinspection	26
	Labeling	28
	Condemnation and Destruction of Unfit Materials	28
	General	29
Chapter 3	Humane Slaughter	33
	<i>James A. Libby</i>	
	History	33
	Legislative Action	34
Chapter 4	Ante-Mortem Inspection	40
	<i>James A. Libby and M. R. Humphreys</i>	
	Animals	40
	Pathology	44
	Poultry	60
Chapter 5	Carcass Dressing and Post-Mortem Inspection Procedures	67
	<i>James A. Libby</i>	
	Technique	67
	Cattle	69
	Calves	77
	Swine	78
	Sheep	82
Chapter 6	Post-Mortem Dispositions	85
	<i>James A. Libby and M. R. Humphreys</i>	
	Guidelines for Dispositions	85
	Poultry	168

	Avian Leukosis Complex	171
	Respiratory Disease Complex	175
Chapter 7	Trichinosis	187
	<i>William J. Zimmerman</i>	
	Introduction	187
	History	187
	Biology	188
	Clinical Disease	189
	Prevalence	191
	Control	194
	Proposed U.S. Trichinosis Eradication Program	202
	Legal Aspects	202
Chapter 8	Comparative Anatomy of Meat Animals	205
	<i>Herbert W. Ockerman</i>	
	Skeletal Structure	205
	Muscle Tissue	208
	Digestive System	214
Chapter 9	Chemistry of Muscle and Major Organs	232
	<i>Herbert W. Ockerman</i>	
	Nitrogen Factor	232
	Lipids	238
	Water	240
	Carbohydrates	241
	Minerals	243
	Vitamins	243
Chapter 10	Deteriorative Changes in Meat	244
	<i>William E. Jennings</i>	
	Durability Factors	244
	Bacterial Action	246
	Molds	248
	Spoilage	248
	Factors Affecting Meat Color	249
	Discoloration of Heme Pigments	250
	Chemical Tests for Incipient Putrefaction of Meat	250
	Insect Infestation	251
	Crystals of Amino Acids	251
	"Freezerburn"	251
	Vinegar-Pickled Product	252
	Deterioration of Fat	253
	Canned Meats	257
Chapter 11	Food-Borne Illness	261
	<i>William E. Jennings</i>	
	Introduction	261
	Classification	262
	Ecology	263
	Chemicals	264

CONTENTS

xi

	Microbes	265
	Significance of Microbiological Findings	290
Chapter 12	Wholesomeness, Adulteration and Misrepresentation	296
	<i>J. D. Willis</i>	
	Wholesomeness and Adulteration	296
	Factors Affecting Wholesomeness	296
	Misrepresentation	305
Chapter 13	Sanitation, Facilities and Procedures in Plant Operation	312
	<i>Joseph L. Blair</i>	
	Water Supply	312
	Ice	317
	Liquid Waste Disposal	317
	Waste Water Treatment Processes	320
	Outside Premises	324
	Rodent Control	325
	Insect Control	330
	Plant Employees	339
	Cleanup	341
	Equipment	345
	Slaughtering Department	348
	Viscera Separating	371
	Refrigerating Departments	375
	Carcass Cutting	377
	Edible Rendering Department	378
	Equipment for Handling Edible Rendered Fat	381
	The Residue Resulting from Rendering	382
	Curing Department	382
	Smokehouses	385
	Sausage Department	385
	Dry Storage	388
	Hide Handling Areas	389
	Inedible Department	389
Chapter 14	Preparation of Meat and Meat Food Products	393
	<i>J. D. Willis</i>	
	Chilling	393
	Cutting	395
	Freezing	400
	Defrosting	402
	Aging	404
	Meat Tenderizer	405
	Dehydrated Meat	406
	Cured and Smoked Meats	407
	Curing Process	412
	Pickle Formulation	413
	Smoking and Cooking	414
	Vinegar Pickled Meats	416
	Sausage Room Products	417

	Classes of Sausage	419
	Other Products Prepared in Casings	425
	Other Products	427
	Handling of Cooked Product	429
	Canning	429
	Rendering	443
Chapter 15	Meat Additives	451
	<i>John Spaulding</i>	
	Natural Additives	454
Chapter 16	Toxic Residues	470
	<i>John Spaulding</i>	
	Pesticides	472
	Environmental Contamination	477
Chapter 17	Exposure to Ionizing Radiation	480
	<i>James D. Lane</i>	
	Nuclear Explosions	480
	Effects of Radiation on Livestock and Poultry	482
	Radiation Preservation of Food	492
	Disaster Preparedness	493
Chapter 18	Organized Meat Hygiene Control	496
	<i>Lois E. Hinson</i>	
	Federal Food and Drug Administration	505
	Relations between the Food and Drug Administration and the Meat and Poultry Inspection Program	509
Chapter 19	Meat Grading	513
	<i>Richard J. Epley and Melvin L. Hamre</i>	
	Scope and Purpose	513
	Beef	513
	Veal and Calf	525
	Lamb	530
	Pork	537
	Poultry	542
Appendix	Meat Production and Per Capita Consumption in U.S., Including Farm Production 1900-1972	548
	Proximate Composition, Mineral and Caloric Content of Fresh Muscle Cuts	549
	Federal Food, Drug, and Cosmetic Act—General Regulations for Its Enforcement	551
	Meat Inspection Regulations—Part 318.10	566
	Talmadge-Aiken Act (P.L. 87-718) 1962	570
	Federal Meat Inspection Act—1967	572
	Poultry Products Inspection Act—1968	594
	Curtis Amendment	616
	Pooled Sample Technique for Detection of Trichinae	616
Glossary	619
Index	625

CHAPTER 1

History

James A. Libby

Since the time of the oldest records of antiquity, as various civilizations developed throughout the world, man has attached importance to the source and handling of his meat supply. From time to time, requirements, restrictions, and even taboos have been influenced by philosophies of diet, religious practices and their ritualistic ramifications. As civilization advances among groups of people, they make conscious efforts to separate themselves as far as possible from the practices of savagery. They no longer are satisfied with being scavengers. The Old Testament, in Exodus 22:31, reads "And ye shall be holy men unto me: neither shall ye eat any flesh that is torn of beasts in the field; ye shall cast it to the dogs."

Hebraic

The quotation from Exodus is the Biblical command from which the Hebrews developed their Laws of Terephah; these laws give the conditions that render animals unacceptable for food. As contained in the Talmud, they constitute a sort of codification of traditional oral law which developed over many centuries of early Hebrew culture. These terephas (or *trefas*, as the word is used today) are considered by the Hebrew law to be defects which would make an animal affected by one or more of them subject to Biblical proscription. Originally, there were 18 kinds of trefas in the Mishnaic portion of the Talmud dated about 200 A.D. These were later grouped into 6 major categories. This

is an example of how detailed the interest of a people can become in the meat portion of its diet.

Alongside the negative law of trefa quite logically developed the positive law of kosher. Today the word *kosher* is used to mean ritually clean. It is significant that these laws of trefa and laws of kosher have become so firmly established and so interwoven with the culture of the Hebrews that they are still retained as part of the ritual of many Jews residing in this country today. Rabbinical representatives are present in many meat-packing plants for the purpose of determining whether meat which is intended to be sold to the Jewish trade meets their ritualistic requirements. That meat which is found to be acceptable is marked with the characters shown in Figure 1-1.



FIG. 1-1. Hebraic characters signifying kosher.

Medieval Florentine

The history of Florentine guilds, specifically, the Guild of Butchers, gives some information concerning controls exercised by Renaissance Florentines over their meat supply. Originally, the slaughtering and merchandising of meat in the city of Florence was monopolized by rich and powerful landholders who controlled large grazing lands.

In spite of their continuing efforts to eliminate the middleman or local butcher from the meat merchandising field, butchers, as a class of artisans, came into being and eventually developed into a powerful guild.

As a result, it became necessary for the city of Florence to pass laws aimed at the correction of unsanitary and fraudulent practices employed by some members of this guild. It appears that the guild members were not only very capable meat merchandisers but, judging from the number of lawsuits, they must have developed a certain amount of ability to defend themselves successfully in the courts.

The laws enacted by the city of Florence during the thirteenth and fourteenth centuries had a fourfold effect. They required that all butchers annually renew their licenses and, at the same time, pledge themselves to observing the law of the land. These laws prohibited many kinds of fraudulent practices consisting principally of misrepresentations and substitutions. They prohibited unsanitary practices, such as carelessness in the disposal of offal and unclean premises, and fined unskilled and untidy workmen. They also provided for appointing expert inspectors whose duty it was to detect and bring to court instances of fraud or other irregular practices prohibited by law.

This pattern of meat control served as a forerunner of the science of meat hygiene. There only remained to fit into this scheme the science of veterinary medicine and to adapt to current needs the controls relating to sanitation, adulteration, and misrepresentation. It has been, in fact, effectively applied in some European countries for many generations.

American

While the present meat-inspection system dates back only to the early part of the twentieth century, the importance of animals' health in relation to a dependable meat supply has long been recognized. As a matter of fact, the first meat-inspection law on this

continent dates back to 1706. An act was passed in New France which required butchers to notify an officer known as the Procureur du Roi whenever meat animals were slaughtered, so that he could attend to inspect the quality of the meat. Farmers bringing meat to town for sale were also directed to present a certificate from their local judge, seigneur, or curé, certifying that it did not come from animals which had been sick, drowned, or poisoned.

In colonial times, the raising of livestock and the marketing of food animals was entirely a local enterprise. The slaughtering or, as it was then called, butchering of local animals supplied the meat bought by the housewives. These local butchers were closely identified with both the farmer who produced the food animals and the consumer of his meat products. This was particularly true of the relationship between the local butcher and his customers.

This close relationship between the local butcher and the consumer in these early times had a definite influence on the kind of butchering practices employed by the local forerunner of the present-day meat packer. The consumers' interest in a disease-free, clean, and wholesome meat supply made itself felt on the local butcher. If he were to have a successful business, it was necessary for him to have the confidence of his customers. This required him to run a clean plant and to merchandise only wholesome, unadulterated products.

As this nation developed in size and systems of transportation covered the country, the livestock and meat industry shifted from a local enterprise to a national one. Livestock raising moved away from meat-consuming areas. The local butchering establishments became retail shops which no longer slaughtered food animals but obtained their meats from large slaughtering plants located conveniently in the large livestock-raising areas. The small slaughtering butcher found himself unable to compete economically with the large slaughtering plant which had the ad-

vantages of location convenient to livestock supplies and of volume production.

As these large meat-packing plants changed the original pattern of local livestock and meat marketing, it became recognized that one of the changes was very closely identified with the consumer interests. By contrast with his success in influencing practices employed by the local butcher, the consumer had no opportunity to influence the large meat packer's practices of sanitation, wholesomeness of product, and freedom from adulteration. It took a little while for consumer interest to crystallize. Actually, the meat inspection law passed in 1890 was intended for the protection of foreign trade in meat and meat products.

In the early 1880s, American dressed beef and, later, American pork products became large factors in American export trade with certain foreign countries. For some years prior to 1890, there were rumors circulated in these foreign countries of the existence of diseases among our food-producing animals which, it was claimed, rendered the meat unfit for food. In 1889, the Secretary of Agriculture in his annual report urged the necessity of a national inspection of cattle at the time of slaughter which would secure the condemnation of carcasses unfit for food and guarantee the accepted product as untainted by disease.

In the first session of the 51st Congress, there was introduced in the Senate S.2594. This bill passed the Senate and was then considered by the House Committee on Agriculture. The committee recommended the passage of the bill on the ground that it was necessary to secure the removal of restrictions placed upon the importation of our meat by foreign countries. This bill, enacted into law by both Houses, was approved by the President on August 30, 1890. It did not provide for post-mortem inspection at time of slaughter. It provided only for an inspection of meats in the piece and then only when intended for exportation to countries whose governments required such inspection or

whenever any buyer, seller, or exporter requested it.

The law failed its purpose, however, for in the next annual report of the Secretary of Agriculture, the Secretary again urged the enactment of a law to provide for a national inspection of cattle at the time of slaughter.

The Secretary pointed out that none of the restrictions against the sale of American meats abroad had been removed and that, indeed, there was a tendency to make these restrictions more stringent and irksome. The trend to restrict American beef was strengthened by the fact that many of these countries already had strong inspection programs being carried out on their slaughter for domestic use.

In the report of the Chief of the Bureau of Animal Industry for the year 1891, there occurs the following comment on the law of 1890: "The Act of Congress of August 30, 1890, provided for the inspection of salted pork and bacon. It was the intention of Congress in passing this measure to enact a law which would enable this government to so certify to the wholesomeness of our pork products that it would entitle them to enter into foreign countries. The provisions of this Act, however, referred more particularly to an inspection which would determine the character and manner in which these products were packed and their condition at time of shipment, and did not reach to the more important object of determining whether the animals from which they came were diseased or not at the time of slaughter." The consequence was that foreign governments refused to recognize such inspection or certificates issued thereunder as sufficient to warrant removal of the prohibition which they had for many years maintained against American pork.

In the reports of the Secretary of Agriculture and of the Chief of the Bureau of Animal Industry for the Fiscal Years 1891, 1893, 1894, and 1895 recommendations were made for amendments to the Meat Inspection Law aimed at strengthening its provisions. These recommendations resulted in the Acts of

March 3, 1891, and March 2, 1895. These laws and their administration fell far short of satisfying the demands of the American public for an adequate national system of meat inspection.

The assassination of President McKinley in 1901 brought Vice President Theodore Roosevelt into the White House. This was significant in that Roosevelt was personally involved in exposing the "embalmed beef" scandal of the Spanish-American War. He testified before a Senate Investigating Committee that he would just as soon have eaten his old hat as the canned food that, under a government contract, had been shipped to his troops in Cuba.

During 1906, while President Roosevelt was serving his second term of office, Upton Sinclair published his book *The Jungle*. The book was an instant success. Even though Sinclair wrote the book to describe social problems of the day, public attention was concentrated on about twelve of the 308 pages concerned with the gruesome details

of meat production. These described situations as the grinding up of poisoned rats, hogs dead of cholera used for a fancy grade of lard, the sale to food markets of the carcasses of steers condemned as tubercular by government inspectors, and, most dramatic of all, the folklore about men who served in the cooking rooms and occasionally fell into the boiling vats, finally ending up on the market as Durham's Pure Leaf Lard.

This book kindled rumors that packing houses were not operated in a sanitary manner and that inspection under the Act of 1891, as amended by the Act of 1895, was not conducted in a thoroughgoing, efficient way. The Secretary of Agriculture appointed a committee to investigate conditions at one of the large packing centers, and the President of the United States appointed a committee for the same purpose.

President Theodore Roosevelt on June 4, 1906, sent a message entitled "Conditions in Chicago Stockyards" to the Senate and House of Representatives. It read as follows:

59TH CONGRESS
1st Session.

HOUSE OF REPRESENTATIVES.

DOCUMENT
No. 873

CONDITIONS IN CHICAGO STOCK YARDS

MESSAGE

FROM THE

PRESIDENT

TRANSMITTING

**THE REPORT OF MR. JAMES BRONSON REYNOLDS AND COMMISSIONER
CHARLES P. NEILL, SPECIAL COMMITTEE APPOINTED TO INVESTIGATE
THE CONDITIONS IN THE STOCK YARDS OF CHICAGO.**

June 4, 1906.—Read; referred to the Committee on Agriculture and ordered to be printed.

THE SENATE AND HOUSE OF REPRESENTATIVES:

I transmit herewith the report of Mr. James Bronson Reynolds and Commissioner Charles P. Neill, the special committee whom I appointed to investigate into the conditions in the stock yards of Chicago and report thereon to me. This report is of a preliminary nature. I submit it to you now because it shows the urgent need of immediate action by the Congress in the direction of providing a drastic and thoroughgoing inspection by the Federal Government of all stock yards and packing houses and of their products, so far as the latter enter into interstate or foreign commerce. The conditions shown by

even this short inspection to exist in the Chicago stock yards are revolting. It is imperatively necessary in the interest of health and of decency that they should be radically changed. Under the existing law it is wholly impossible to secure satisfactory results.

When my attention was first directed to this matter an investigation was made under the Bureau of Animal Industry of the Department of Agriculture. When the preliminary statements of this investigation were brought to my attention they showed such defects in the law and such wholly unexpected conditions that I deemed it best to have a further immediate investigation by men not connected with the Bureau, and accordingly appointed Messrs. Reynolds and Neill. It was impossible under the existing law that satisfactory work should be done by the Bureau of Animal Industry. I am now, however, examining the way in which the work actually was done.

Before I had received the report of Messrs. Reynolds and Neill I had directed that labels placed upon any package of meat food products should state only that the carcass of the animal from which the meat was taken had been inspected at the time of slaughter. If inspection of meat food products at all stages of preparation is not secured by the passage of the legislature recommended, I shall feel compelled to order that inspection labels and certificates on canned products shall not be used hereafter.

The report shows that the stock yards and packing houses are not kept even reasonably clean, and that the method of handling and preparing food products is uncleanly and dangerous to health. Under existing law the National Government has no power to enforce inspection of the many forms of prepared meat food product that are daily going from the packing houses into interstate commerce. Owing to inadequate appropriation the Department of Agriculture is not even able to place inspectors in all establishments desiring them. The present law prohibits the shipment of uninspected meat to foreign countries, but there is no provision forbidding the shipment of uninspected meats in interstate commerce, and thus the avenues of interstate commerce are left open to traffic in diseased or spoiled meats. If, as has been alleged on seemingly good authority, further evils exist, such as the improper use of chemicals and dyes, the Government lacks power to remedy them. A law is needed which will enable the inspectors of the General Government to inspect and supervise from the hoof to the can the preparation of the meat food product. The evil seems to be much less in the sale of dressed carcasses than in the sale of canned and other prepared products; and very much less as regards products sent abroad than as regards those used at home.

In my judgment the expense of the inspection should be paid by a fee levied on each animal slaughtered. If this is not done, the whole purpose of the law can at any time be defeated through an insufficient appropriation; and whenever there was no particular public interest in the subject it would not be only easy but natural to thus make the appropriation insufficient. If it were not for this consideration, I should favor the Government paying for the inspection.

The alarm expressed in certain quarters concerning this feature should be allayed by a realization of the fact that in no case, under such a law, will the cost of inspection exceed 8 cents per head.

I call special attention to the fact that this report is preliminary, and that the investigation is still unfinished. It is not yet possible to report on the alleged abuses in the use of deleterious chemical compounds in connection with canning and preserving meat products, nor on the alleged doctoring in this fashion of tainted meat and of products returned to the packers as having grown unsalable or unusable from age or from other reasons. Grave allegations are made in reference to abuses of this nature.

Let me repeat that under the present law there is practically no method of stopping these abuses if they should be discovered to exist. Legislation is needed in order to prevent the possibility of all abuses in the future. If no legislation is passed, then the excellent results accomplished by the work of this special committee will endure only so long as the memory of the committee's work is fresh, and a recrudescence of the abuses is absolutely certain.

I urge the immediate enactment into law of provisions which will enable the Department of Agriculture adequately to inspect the meat and meat food products entering into interstate commerce and to supervise the methods of preparing the same, and to prescribe the sanitary conditions under which the work shall be performed. I therefore commend to your favorable consideration and urge the enactment of substantially the provisions known as Senate amendment No. 29 to the act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1907, as passed by the Senate, this amendment being commonly known as the Beveridge amendment.

THEODORE ROOSEVELT.

THE WHITE HOUSE, June 4, 1906.

Following are excerpts from the report made to President Roosevelt by Commissioner Charles P. Neill and Mr. James Bronson Reynolds.

CONDITIONS OF THE YARDS.

The pavement is mostly of brick, the bricks laid with deep grooves between them, which inevitably fill with manure and refuse. Such pavement cannot be properly cleaned and is slimy and malodorous when wet, yielding clouds of ill-smelling dust when dry. Calves, sheep, and hogs, that have died en route are thrown out upon the platforms where cars are unloaded.

BUILDINGS.

The interior finish of most of the buildings is of wood. In many of the rooms where water is used freely the floors are soaked and slimy. Many inside rooms where food is prepared are without windows, deprived of sunlight and without direct communication with the outside air. They may be best described as vaults in which the air rarely changes. In a few instances electric fans mitigate the stifling air, but usually the workers toil without relief in a humid atmosphere heavy with the odors of rotten wood, decayed meats, stinking offal, and entrails.

The work tables upon which the meat is handled, the floor carts on which it is carried about, and the tubs and other receptacles into which it is thrown are generally of wood. These wooden receptacles are frequently found water soaked, only half cleansed, and with meat scraps and grease accumulations adhering to their sides and collecting dirt.

Nothing shows more strikingly the general indifference to matters of cleanliness and sanitation than do the privies for both men and women. The prevailing type is made by cutting off a section of the workroom by a thin wooden partition rising to within a few feet of the ceiling. These privies usually ventilate into the workroom, though a few are found with a window opening into the outer air. Many are located in the inside corners of the workrooms, and thus have no outside opening whatever. They are furnished with a row of seats, generally without even side partitions. These rooms are sometimes used as cloakrooms by the employees. Washing sinks are either not furnished at all or are small and dirty. Neither are towels, soap, or toilet paper provided. Men and women return directly from these places to plunge their unwashed hands into the meat to be converted into such food products as sausage, dried beef, and other compounds. Some of the privies are situated at a long distance from the workrooms, and men relieve themselves on the killing floors or in a corner of the workrooms. Hence, in some cases the fumes of the urine swell the sum of nauseating odors arising from the dirty-blood-soaked, rotting wooden floors, fruitful culture beds for the disease germs of men and animals.

TREATMENT OF MEATS AND PREPARED FOOD PRODUCTS.

In some of the largest establishments sides that are sent to what is known as the boning room are thrown in a heap upon the floor. The workers climb over these heaps of meat, select the pieces they wish, and frequently throw them down upon the dirty floor beside their working bench. Even in cutting the meat upon the bench, the work is usually held pressed against their aprons, and these aprons were, as a rule, indescribably filthy. They were made in most cases of leather or of rough sacking and bore long accumulated grease and dirt. In only a few places were suitable oilcloth aprons worn. Moreover, men were seen to climb from the floor and stand, with shoes dirty with the refuse of the floors, on the tables upon which the meat was handled.

Meat scraps were also found being shoveled into receptacles from dirty floors where they were left to lie until again shoveled into barrels or into machines for chopping. These floors, it must be noted, were in most cases damp and soggy, in dark, ill-ventilated rooms, and the employees in utter ignorance of cleanliness or danger to health expectorated at will upon them. In a word, we saw meat shoveled from filthy wooden floors, piled on tables rarely washed, pushed from room to room in rotten box carts, in all of which processes it was in the way of gathering dirt, splinters, floor filth and the expectoration of tuberculous and other diseased workers. Where comment was made to floor superintendents about these matters, it was always the reply that this meat would afterwards be cooked, and that this sterilization would prevent any danger from its use. Even this, it may be pointed out in passing, is not wholly true. A very considerable portion of the meat so handled is sent out as smoked products and in the form of sausages, which are prepared to be eaten without being cooked.

As an extreme example of the entire disregard on the part of employees of any notion of cleanliness in handling dressed meat, we saw a hog that had just been killed, cleansed, washed, and started on its way to the cooling room fall from the sliding rail to a dirty wooden floor and slide part way into a filthy men's privy. It was picked up by two employees, placed upon a truck, carried into the cooling room and hung up with other carcasses, no effort being made to clean it. In another establishment, a long table was noted covered with several hundred pounds of cooked scraps of beef and other meats. Some of these meat scraps were dry, leathery, and unfit to be eaten; and in the heap were found pieces of pig-skin, and even some bits of rope strands and other rubbish. Inquiry evoked the frank admission from the man in charge that this was to be ground up and used in making "potted ham." All of these canned products bear labels of which the following is a sample:

ABATTOIR No.—.

The contents of this package have been
inspected according to the act of
Congress of March 3, 1891.

QUALITY GUARANTEED

Another instance of abuse in the use of the labels came to our notice. In two different establishments great stocks of old canned goods were being put through a washing process to remove the old labels. They were then subjected to sufficient heat to "liven up" the contents—to use the phrase of the room superintendent. After this, fresh labels, with the Government name on them, were to be placed upon the cans, and they were to be sent out bearing all the evidence of being a freshly put up product. In one of these instances, by the admission of the superintendent, the stock thus being relabeled was over two years old. In the other case the superintendent evaded a statement of how old the goods were.

TREATMENT OF EMPLOYEES.

The insanitary conditions in which the laborers work and the feverish pace which they are forced to maintain inevitably affects their health. Physicians state that tuberculosis is disproportionately prevalent in the stock yards, and the victims of this disease expectorate on the spongy wooden floors of the dark workrooms, from which falling scraps of meat are later shoveled up to be converted into food products.

Even the ordinary decencies of life are completely ignored. In practically all cases the doors of the toilet rooms open directly into the working rooms, the privies of men and women frequently adjoin.

GOVERNMENT INSPECTION.

Inspection after slaughter appears to be carefully and conscientiously made. The Government veterinarians maintain that it is adequate, insisting that a passing examination of certain glands, of the viscera, and of the general conditions of the carcass is sufficient to enable an expert, engaged constantly on this work, to detect at once the presence of disease, or of abnormal conditions. On the slightest indication of disease or abnormal conditions the carcass is tagged and set aside for a later and more careful examination. There should, however, be more precautions taken to insure that the instruments used be kept antiseptically clean.

The microscopic examination of hogs to be exported to Germany appears to be made with great care, and it may fairly be asked why the same inspection is not made of hogs killed for the American market.

We noted that some large establishments had an obviously insufficient force. A few small concerns had no inspectors at all, and may sell uninspected meat wherever they please in the United States.

LEGISLATION.

1. Examination before slaughter is of minor importance and should be permissive instead of mandatory. Examination after slaughter is of supreme importance and should be compulsory.