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# REPORT TO THE CONGRESS



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## Salmonella In Raw Meat And Poultry: An Assessment Of The Problem B-164031(2)

Food and Drug Administration  
Department of Health, Education, and Welfare  
Animal and Plant Health Inspection Service  
Department Of Agriculture

**BY THE COMPTROLLER GENERAL  
OF THE UNITED STATES**

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COMPTROLLER GENERAL OF THE UNITED STATES

WASHINGTON, D.C. 20548

B-164031(2)

To the President of the Senate and the  
Speaker of the House of Representatives

This is our report on the problem of controlling salmonella in raw meat and poultry products and the improvements needed by the Food and Drug Administration, Department of Health, Education, and Welfare, and the Animal and Plant Health Inspection Service, Department of Agriculture, to reduce the potential public health hazard resulting from such contaminated products.

We made our review pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

We are sending copies of this report to the Director, Office of Management and Budget; the Secretary of Health, Education, and Welfare; and the Secretary of Agriculture.

*James B. Stacks*

Comptroller General  
of the United States

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ABBREVIATIONS

APHIS	Animal and Plant Health Inspection Service
FDA	Food and Drug Administration
FD&C Act	Federal Food, Drug and Cosmetic Act
GAO	General Accounting Office
HEW	Department of Health, Education, and Welfare

D I G E S T

WHY THE REVIEW WAS MADE

Because of the hazard to public health from raw meat and poultry products contaminated with salmonella--a bacteria often causing food poisoning--GAO assessed the problem of salmonella contamination to learn whether the Departments of Health, Education, and Welfare (HEW) and Agriculture can improve their efforts to reduce salmonellosis.

FINDINGS AND CONCLUSIONS

Some authorities consider salmonellosis--the infection caused by the bacteria--to be one of the most important communicable disease problems of bacterial origin in the United States. An estimated two million cases occur annually, resulting in medical payments and lost working days costing at least \$300 million.

Meat and poultry are among the foods most likely to carry salmonella because animals are frequently infected with the bacteria. Although salmonella in food may be killed during cooking, salmonella in meat and poultry can spread (cross-contamination) during handling to other foods that are not normally

cooked and to utensils. (See p. 1.)

HEW's Food and Drug Administration (FDA) is responsible for insuring that foods shipped in interstate commerce are safe, pure, and wholesome. This includes animal feeds and their ingredients because they can be a source of infection to livestock and poultry and ultimately man.

The Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is responsible for preventing interstate shipment of meat and poultry products that are unwholesome, adulterated, or otherwise unfit for human consumption. APHIS also has authority to prevent the interstate shipment of diseased livestock and poultry.

Overall findings

Salmonella-contaminated raw meat and poultry products are reaching the market; yet consumers have not been adequately alerted to the problem nor to safeguards they must take to minimize the spread of this bacteria.

Although it appears unreasonable to expect salmonellosis to be

eradicated, more can be done to reduce the incidence of infection.

Federal efforts have not had a major impact in controlling human salmonellosis and have resulted in certain industry segments being regulated for salmonella contamination while others are not.

Salmonella-contaminated raw meat and poultry products on the retail market

Salmonella-contaminated raw meat and poultry products are being sold to the public, and neither FDA nor APHIS has current national data which shows the extent of contamination at the retail level.

Such data could be useful in identifying changes in the incidence of contamination and in determining Federal programs' success to control salmonella. (See p. 5.)

FDA, at GAO's request, analyzed 100 raw meat and 100 raw poultry samples for salmonella contamination. It purchased the products from retail stores in 10 metropolitan areas where about 23 percent of the Nation's population resides.

Laboratory analysis showed that 33 samples, or 17 percent, were contaminated--31 percent of the chicken, 15 percent of the pork, 11 percent of the lamb, 10 percent of the turkey, and none of the beef. (See p. 6.)

Although FDA and APHIS have authority, they do not regulate salmonella-contaminated products on the retail market.

FDA believes Agriculture with its statutory authority and resources, can better assess and control

salmonella in raw meat and poultry products. According to APHIS, regulation at the retail level is not feasible or economical. (See p. 8.)

Controlling salmonellosis

Controlling salmonellosis is complicated because salmonella is widely distributed in the environment and can reach man in many ways. (See p. 10.)

Because of the problem's complexity, the high estimated cost of a comprehensive approach to significantly reduce salmonella in the food chain, and the uncertainty that such an approach would significantly reduce prevalence of human salmonellosis, Federal efforts have been piecemeal. (See pp. 10 to 15.)

FDA and APHIS monitor the Nation's processed food industry for salmonella, but not raw meat and poultry products.

FDA requires pet turtles to be certified salmonella-free before being shipped in interstate commerce. APHIS does not require similar certification for livestock and poultry intended for human consumption, even though the likelihood of salmonella contamination from such animals is high. According to APHIS, many animals carry the bacteria as a normal constituent. (See pp. 20 and 21.)

The National Academy of Sciences concluded it was unreasonable to expect salmonellosis to be eradicated in the foreseeable future but said it could be substantially reduced if the problem was attacked along a broad front. The Academy made recommendations to achieve

timely control of salmonellosis.  
(See p. 10.)

FDA believed the Academy's recommendations were valid and, within limits, feasible to implement. According to APHIS, the recommendations were overwhelming in magnitude and cost, particularly since there was no insurance that such a program would significantly reduce human salmonellosis (See p. 10.)

FDA and APHIS are uncertain whether controlling salmonella in rendered animal by-products and animal feeds will reduce human infection. HEW's Center for Disease Control believes a program to control salmonella in animal feeds will contribute significantly to reduce human salmonellosis. (See pp. 11 to 13.)

During GAO's review, FDA and Agriculture each formed an internal task force to review the problem. HEW and Agriculture officials advocated the following after releasing the task forces' results in August 1973.

- Continuation of a cooperative Federal-State-industry program coordinated by FDA to eliminate salmonella from rendered animal by-products used in animal feeds.
- Modification of processing procedures and facilities in meat and poultry plants under Agriculture's inspection to reduce bacterial cross-contamination of products and equipment.
- Intensified support of industry- and Agriculture-financed research aimed at controlling and eliminating salmonella throughout the food chain.
- FDA development of model ordinances governing sanitation and

food handling in retail stores and food service institutions and of sanitation standards for the food transportation industry.

- Expansion and coordination of an intensive consumer education campaign aimed at eliminating careless food-handling practices in the home and food service establishments. (See p. 21.)

As of March 1974 the task forces' recommendations had not been fully implemented.

Consumer education--a practical safeguard against salmonellosis

Although FDA and APHIS view consumer education as an essential and practical safeguard against salmonellosis, their programs to inform the public on such safeguards need to be improved.

Generally, these programs do not identify those groups having greatest need for such information. In addition, FDA and APHIS have not periodically evaluated their programs' effectiveness. (See p. 23.)

GAO contracted with The Gallup Organization, Inc., to determine what the Nation's 73 million women knew about salmonella. Study results indicated that

- 74 percent, or 54 million women, did not know that salmonella is a bacteria which may cause food poisoning,
- 66 percent, or 48 million women, did not know how to minimize the spread of salmonella within the home, and
- 39 percent, or 28 million women, were certain raw meat and poultry

on the market were inspected by Federal or State inspectors for salmonella, when, in fact, they are not. (See p. 25.)

Certain demographic data--age, household income, etc.--could be used to identify target groups requiring intensified consumer education programs. (See p. 26.)

#### RECOMMENDATIONS

GAO recommends that HEW and Agriculture:

--Implement the task forces' recommendations to achieve more timely and effective control of the salmonella problem.

After considering the practical limitations for controlling salmonella, they should establish goals, time frames, and estimated costs for implementing the recommendations.

--Cooperate in a program to assess the extent of salmonella-contaminated raw meat and poultry products (by product type) on the market.

Once a baseline has been established, periodic national samples should be taken to monitor any change in contamination levels.

Such information would be useful in determining whether Federal programs to control salmonella are successful.

--Emphasize to consumers the serious potential health problem associated with handling raw meat and poultry, particularly chicken and pork, and the pre-

cautions to take in handling them.

Consumers should be told these products have the highest rates of contamination and that lamb, turkey, and beef are less contaminated.

--Periodically measure effectiveness of their consumer education programs. To supplement a broader educational effort, consideration should be given to identifying target groups, such as the elderly, to which intensified consumer education should be directed.

#### AGENCY ACTIONS AND UNRESOLVED ISSUES

HEW and Agriculture agreed with most of GAO's recommendations and said several actions had been or would be taken to implement them.

They indicated difficulty, however, in evaluating their program efforts on the basis of changes in the levels of salmonella contamination in raw meat and poultry on the market.

In addition HEW said, in view of the difficulty in eliminating salmonella from raw meat and poultry, current FDA resources cannot significantly affect the salmonella problem unless such resources are complemented by State governments, the industries involved, and other Federal agencies. Agriculture said, due to resource limitations, it has not been able to carry out an unlimited effort against all avenues of salmonella contamination.

HEW and Agriculture comments and GAO's evaluation are in chapter 5. (See p. 31.)

MATTERS FOR CONSIDERATION  
BY THE CONGRESS

This report alerts the Congress on

the adequacy and implementation of Federal laws and programs intended to protect the consumer from salmonella-contaminated products.

## CHAPTER 1

### INTRODUCTION

We have issued a number of reports concerning the programs of the Departments of Health, Education, and Welfare (HEW) and Agriculture to protect consumers from foods which are unwholesome, adulterated, or otherwise unfit for human consumption. (See app. I.) These reports discussed sanitation in federally inspected food processing plants; the need to insure that foods reaching the consumer are safe, pure, and wholesome; and ways to improve Federal regulatory activities to remove harmful products from the market.

This report discusses salmonella--a bacteria which often causes food poisoning. Some authorities consider salmonellosis--the infection caused by the bacteria--to be one of the most important communicable disease problems of bacteria origin in the United States.

About 1,300 types of salmonella, including the type that causes typhoid fever, can cause salmonellosis. Although typhoid is under control in this country, infections caused by other types of salmonella are not. Twelve types account for about 78 percent of the documented human infections. An estimated 2 million cases of human salmonellosis occur annually which result in medical payments and lost working days costing at least \$300 million.

Meat and poultry are among foods most likely to carry salmonella because animals are frequently infected with the bacteria. Although salmonella in food may be killed during cooking, salmonella in meat and poultry brought home can spread (cross-contamination) during handling to other foods that are not normally cooked and to utensils.

Salmonellosis symptoms include headache, vomiting, diarrhea, abdominal pain, and fever. Severe cases may even cause death. Infants, the elderly, and the ill are most susceptible.

HEW's Food and Drug Administration (FDA) is responsible under the Federal Food, Drug and Cosmetic Act (FD&C Act) (21 U.S.C. 301) to insure that foods shipped in interstate commerce are safe, pure, and wholesome. This includes

animal feeds and their ingredients because they can be a source of infection to livestock and poultry and ultimately man.

Agriculture's Animal and Plant Health Inspection Service (APHIS),<sup>1</sup> is responsible, under the Federal Meat Inspection Act (21 U.S.C. 601) and the Poultry Products Inspection Act, as amended by the Wholesome Poultry Products Act (21 U.S.C. 451) (hereinafter referred to as the Meat and Poultry Inspection Acts), for preventing the interstate shipment of meat and poultry products that are unwholesome, adulterated, or otherwise unfit for human consumption. The Meat and Poultry Inspection Acts authorize APHIS to cooperate with States in developing and administering State meat and poultry inspection programs in States having laws imposing meat and poultry inspection and sanitation requirements at least equal to Federal laws governing meat and poultry products moved in interstate commerce. For those States not having programs at least equal to Federal laws, APHIS designates the State for Federal inspection and assumes inspection responsibility for its intrastate plants. Also, APHIS has authority (21 U.S.C. 111) to prevent the interstate shipment of diseased animals and poultry. Before October 1971, the Agricultural Research Service of the Department of Agriculture had this responsibility.

Protecting the consumer from food-borne illnesses caused by bacteria or insanitary processing is an objective of the FD&C Act and the Meat and Poultry Inspection Acts. Human and animal foods contaminated with salmonella are adulterated products under the FD&C Act. Salmonella-contaminated meat and poultry products are adulterated products under the Meat and Poultry Inspection Acts.

When adulterated products, or insanitary plant conditions that may also cause adulteration, are found, FDA and APHIS can initiate one or more of the following legal actions through the Department of Justice.

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<sup>1</sup>The meat and poultry inspection activities discussed in this report were previously the responsibility of Agriculture's Consumer and Marketing Service. Effective April 2, 1972, it was renamed the Agricultural Marketing Service and its meat and poultry inspection functions were transferred to APHIS.

- Prosecute an individual who violates the FD&C Act and Meat and Poultry Inspection Acts.
- Enjoin a plant or individual to perform or not perform some act.
- Seize any food that is adulterated or misbranded when introduced into, or while in, interstate commerce.

The Meat and Poultry Inspection Acts authorize FDA and APHIS to temporarily detain, from interstate shipment, meat and poultry products suspected of violating the acts. In addition, APHIS can suspend Federal inspection at slaughtering and processing plants that fail to maintain sanitary conditions. If inspection is suspended, a plant cannot operate.

Although recall authority is not specified under the FD&C Act and Meat and Poultry Inspection Acts, FDA and APHIS permit firms to voluntarily recall products alleged to violate the acts.

FDA and Agriculture agencies, including APHIS, have undertaken activities which directly or indirectly protect food from salmonella contamination. These include activities directed at:

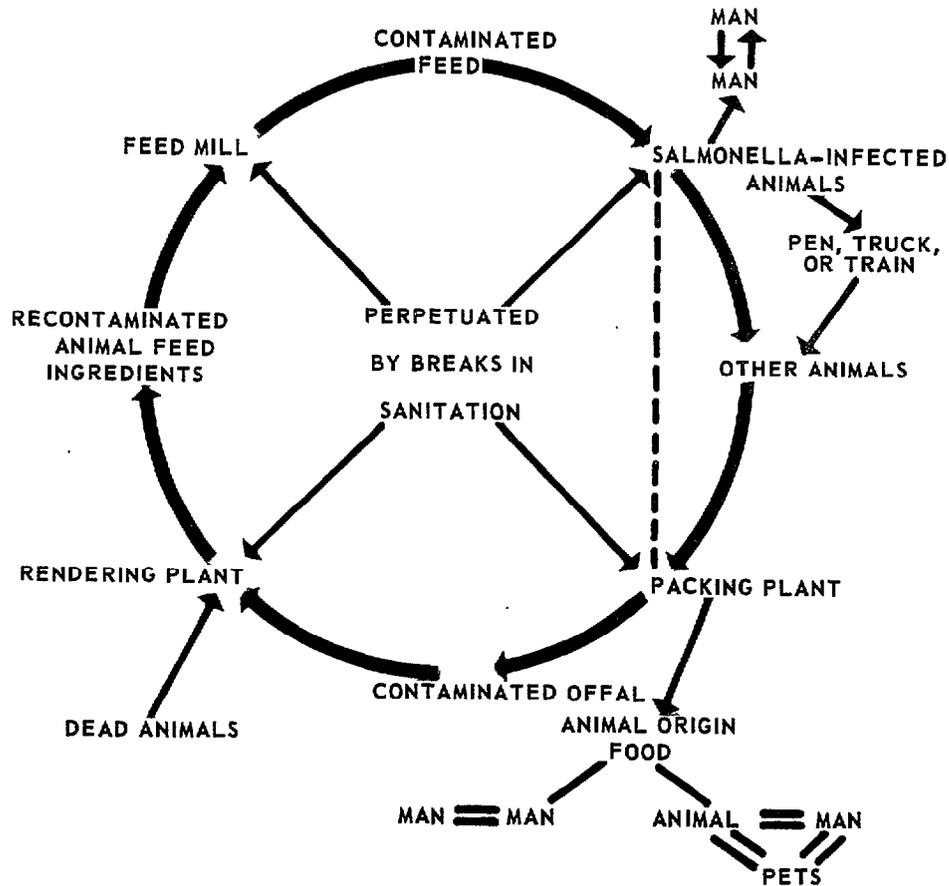
- Rendered products, including fish meal.
- Poultry-breeding stock.
- Poultry- and livestock-slaughtering plants.
- Processed food plants.
- Consumer education.

Raw meat and poultry can become contaminated with salmonella from a number of sources during the raising and marketing of livestock and poultry for human consumption. Contaminated rendered products<sup>1</sup> used in animal feeds are sterilized when properly heated in rendering plants but can become recontaminated because of insanitary plant conditions.

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<sup>1</sup>Processed animal and poultry feeds made from a protein-based product consisting of bone meal, intestines, and other animal and fish remains.

Contaminated feed infects animals and leads to salmonella excretion. Animals may thus infect other animals directly or contaminate the environment. If slaughtering-plant sanitation conditions are lax, the infected livestock and poultry can contaminate raw meat and poultry products during processing. These foods can then infect humans and pets. The cycle in which livestock and poultry become salmonella contaminated is depicted below.<sup>1</sup>



We examined the salmonella contamination problem to determine if HEW and Agriculture could improve their efforts to reduce salmonellosis. Chapter 6 contains the scope of our review.

<sup>1</sup>William F. Nape, D. V. M., excerpt from a paper entitled "Recovery of Salmonella from Material in Feed Mills," presented to the Salmonella Committee at the Seventy-Second Annual Meeting, United States Livestock Sanitary Association, New Orleans, La., Oct. 6 to 11, 1968.

## CHAPTER 2

### SALMONELLA-CONTAMINATED RAW MEAT

#### AND POULTRY PRODUCTS ON THE RETAIL MARKET

Although Federal laws prohibit the sale of contaminated food products, salmonella-contaminated raw meat and poultry products are being sold to the public. Neither FDA nor APHIS has current national data which shows the extent of contamination at the retail level. Such data could be useful in identifying changes in the incidence of contamination and in determining the success of Federal programs to control salmonella.

#### FDA-GAO SURVEY OF SALMONELLA-CONTAMINATED RAW MEAT AND POULTRY PRODUCTS ON THE RETAIL MARKET

In November 1972 FDA, at our request, analyzed 100 raw meat and 100 raw poultry samples for salmonella contamination. It purchased the products from 20 retail stores in each of 10 metropolitan areas where about 23 percent of the Nation's population resides: Atlanta, Boston, Chicago, Dallas, Detroit, Los Angeles, New York, Philadelphia, San Francisco, and Washington, D.C. The stores selected were in both urban and suburban areas and included large- and medium-size supermarkets, neighborhood grocery stores, and meat markets.<sup>1</sup>

According to FDA's analysis, 33, or about 17 percent, of the 200 samples were salmonella contaminated. The highest incidence was found in the 90 chicken samples-- 31 percent were contaminated. Also contaminated were 3 of 20 pork samples, 1 of 9 lamb samples, and 1 of 10 turkey samples. None of 71 beef products were contaminated. The analysis results follow.

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<sup>1</sup> Stores were designated urban or suburban on the basis of resident GAO auditors' knowledge of the areas. Stores described as large are generally those having six or more checkout registers; medium are those having two to five registers; and neighborhood stores and local meat markets are generally those having one register.

	Number of samples examined	Salmonella found	
		Number	Percent
Chicken	90	28	31.0
Pork	20	3	15.0
Lamb	9	1	11.1
Turkey	10	1	10.0
Beef	<u>71</u>	<u>0</u>	<u>0</u>
Total	<u>200</u>	<u>33</u>	16.5

The contamination rate in urban stores was about twice the suburban rate and ranged from about 14 percent in small stores to about 21 percent in medium-size supermarkets.

	Samples examined	Salmonella found	
		Number	Percent
Location of store:			
Urban	141	27	19.1
Suburban	<u>59</u>	<u>6</u>	<u>10.1</u>
Total	<u>200</u>	<u>33</u>	16.5
Type of store:			
Large supermarkets	55	9	16.3
Medium supermarkets	53	11	20.7
Neighborhood grocery stores and local meat markets	<u>92</u>	<u>13</u>	<u>14.1</u>
Total	<u>200</u>	<u>33</u>	16.5

Because bacteriological inspections of the 200 stores were not made, it is not known if sanitation conditions contributed to the level of salmonella contamination or whether the products were contaminated before the stores received them. FDA officials advised us they have directed FDA field offices to provide information on the contaminated samples to State and local health authorities for their consideration.

APHIS said the survey results were what it would expect from a sample of retail stores.

## OTHER RETAIL MARKET STUDIES

FDA and APHIS identified eight studies that were reported from 1960 through 1973, which showed various rates of salmonella-contaminated raw meat and poultry at the retail market level. Each study was local in that samples were collected in only one city, and in some cases the studies were limited to one product, such as poultry. The purposes of the studies varied. For example, one study compared sanitation at stores where contaminated products were found, and another compared different techniques to identify salmonella in raw meat and poultry products. The studies showed that salmonella-contaminated products ranged from 8 percent to 50 percent of the samples. A summary of the results follows.

Year reported	Location of stores	Poultry		Pork		Lamb		Beef		Total	
		Samples examined	Percent contaminated								
1960	Atlanta, Ga.	-	-	106	38	-	-	-	-	106	38
1961	Cincinnati, Ohio	525	17	417	4	70	3	413	1	1,425	8
1964	Lafayette, Ind.	264	27	-	-	-	-	-	-	264	27
1966	Boston, Mass.	237	50	-	-	-	-	-	-	237	50
1969	Athens, Ga.	-	-	81	38	-	-	-	-	81	38
1970	Cincinnati, Ohio	30	47	-	-	-	-	30	3	60	25
1970	Atlanta, Ga.	-	-	68	38	-	-	-	-	68	38
1973	Starkville, Miss.	61	21	89	16	-	-	-	-	150	18
		<u>1,117</u>	27	<u>761</u>	17	<u>70</u>	3	<u>443</u>	1	<u>2,391</u>	18

Note: See app. II for study acknowledgments.

The four most recent studies are summarized below:

### Athens study

In 1969 University of Georgia researchers reported on their study to determine the incidence of salmonella at five meat-processing plants. They purchased 81 samples of fresh pork sausage from local retail meat markets in Athens. Laboratory analysis showed that 31, or about 38 percent, were salmonella contaminated.

BEST DOCUMENT AVAILABLE

### Cincinnati study

In 1970 FDA researchers reported on their study of certain foods purchased at Cincinnati stores. They analyzed 60 raw products for salmonella-- 30 samples of chicken and 30 samples of hamburger. Laboratory analysis showed that 14 chicken samples, or 47 percent, and 1 hamburger sample, or about 3 percent, were salmonella contaminated.

### Atlanta study

In 1970 researchers from HEW's Center for Disease Control reported on different techniques for isolating salmonella from pork sausage. They purchased samples from grocery stores in the Atlanta area. Of the 68 samples analyzed, 26, or about 38 percent, were salmonella contaminated.

### Starkville study

In 1973 Mississippi State University researchers, under Agriculture's sponsorship, studied the incidence of salmonella in certain products. In total, 150 raw products--89 samples of pork sausage and 61 frying chickens--were purchased from retail outlets in the Starkville area. According to laboratory analysis, 14 sausage samples, or about 16 percent, and 13 chicken samples, or about 21 percent, were salmonella contaminated.

## MONITORING AT THE RETAIL LEVEL

FDA and APHIS have regulatory responsibility to protect the public from contaminated raw meat and poultry products on the retail market. FDA advised us that it has not instituted a retail testing program for salmonella in raw meat and poultry because Agriculture, with its statutory authority and resources, can better assess and control salmonella in these products. According to APHIS, however, Federal regulatory action is not feasible or economical because:

- Over 39 billion pounds of raw meat and poultry products are sold annually and the products are produced from animals that may be carrying salmonella as a normal constituent.

--About 235,000 retail stores would be subject to monitoring.

--It takes about 10 to 14 days to identify positive sample results of salmonella through laboratory analysis.

Chapter 3 includes Federal efforts to control salmonella and additional comments on the complexity of controlling it. Chapter 5 contains our conclusions and recommendations and agency comments on matters in this chapter.

## CHAPTER 3

### CONTROLLING SALMONELLOSIS

Controlling salmonellosis is complicated because salmonella is widely distributed in the environment and can reach man from numerous sources, including pets, drugs, and contaminated water and foods that have been improperly handled or processed. Because of the high frequency of salmonella in animals, meat and poultry can be hazardous to public health.

During the 1960s, Public Health Service officials were alarmed at the reported increase of human salmonellosis in the United States and focused more Federal attention on the problem of salmonella in raw meat and poultry. According to these officials, salmonella must be controlled in animals because they are the major source of human salmonellosis.

Although some Federal Government and private sector authorities have different opinions on the benefits of more intensive monitoring of certain industries, such as the rendering and feed industries, they agree that more can be done to reduce human salmonellosis.

#### STUDY BY THE NATIONAL ACADEMY OF SCIENCES

In June 1967, at the request of FDA and Agriculture, the Academy undertook an in-depth study of the salmonella problem. The study, completed in 1969, concluded that, although it is unreasonable to expect salmonellosis to be eradicated in the foreseeable future, a great deal can be done to reduce salmonella in our food supply and thereby minimize the likelihood of infection. To do this, a broad attack would be required. The Academy made recommendations to achieve timely control of salmonellosis, which were directed at (1) contamination of raw animal products and drinking water, (2) contamination of processed foods, feeds, and drugs, (3) mishandling of food during preparation and serving, (4) education and training, and (5) research.

FDA believed the recommendations were valid and, within limits, feasible to implement. APHIS felt the recommendations were overwhelming in magnitude and cost, particularly because

there was no insurance that such a program would significantly reduce human salmonellosis. The Administrator, APHIS, stated that:

"\* \* \* In terms of the total salmonella question, our approach was just scratching the surface. We believe that to reduce effectively human incidence, a government and livestock industrywide program would cost several hundred million dollars. Also there is no predictable assurance that even a comprehensive approach will significantly reduce the prevalence [of salmonellosis] in the human population. \* \* \*"

APHIS also said that measures to substantially reduce salmonella in poultry and livestock would increase the cost of these products to the consumer.

The chairman of the Academy's committee that evaluated the salmonella problem, in responding to an FDA request for his views on the merits of a program directed at inspecting and sampling rendering plants for salmonella, stated in March 1973 that:

"If this country's government wants to protect its citizens against foodborne salmonellosis, I suggest a reexamination of the report of the Salmonella Committee, National Academy of Sciences - National Research Council, 1969. Titled 'An Evaluation of the Salmonella Problem,' the report lists many things that should be done to minimize human exposure to the organism. These range from education of the food handler to research aimed at learning how to prevent infections in animals. Up to now, it seems to me, the regulatory agencies have concentrated with only moderate success on eliminating salmonellae from processed foods and from animal feeds. Processed foods have never been important sources of human infection and eliminating the organism from animal feed apparently is not enough."

#### OPINIONS ON CONTROLLING SALMONELLA IN RAW MEAT AND POULTRY

We discussed the problems of controlling salmonella in raw meat and poultry with officials of FDA, APHIS, and the

Center for Disease Control and with other authorities. We obtained views on whether the elimination of salmonella from rendered products and finished feed would control salmonella in raw meat and poultry and reduce human salmonellosis. Although most authorities indicated that eliminating salmonella from rendered products and finished feed would be desirable, they did not agree on whether such elimination would greatly reduce human salmonellosis.

#### FDA

The Commissioner, FDA, advised us in February 1973 that there was no clear or concise answer because:

" \* \* \* there are avenues of Salmonella infection open to animals other than contaminated feeds such as a contaminated environment or animal to animal transfer. However, because contaminated feeds are a contributor, a reduction here would be expected to produce some kind of a reduction in human infections but the relationship is a complicated one and a simple estimate or explanation is not forthcoming."

#### APHIS

The Administrator, APHIS, advised us in February 1973, that, on the basis of present resources and priorities, no additional measures were planned to "drastically" reduce salmonella in raw meat and poultry. He said about \$1.6 million is budgeted annually for research. Until new information shows a more effective way to deal with the problem, APHIS will concentrate on improving sanitation in meat- and poultry-processing plants and will actively support a dynamic educational program to inform handlers of raw meat and poultry (including housewives) of precautions they should take when handling these products. (Chapter 4 discusses the educational program's effectiveness.)

The Administrator further said:

"The elimination of salmonella from all rendered products and finished feed may result in some reduction in the number of animals that are carrying salmonella in their

intestinal tract at time of slaughter. I say may because there are many opportunities for exposure other than feed from birth until the animal reaches the slaughter establishment. It may decrease the number of contaminated carcasses and the amount of contamination that occurs during the slaughtering process. The data required for a scientific estimate of the amount of such reduction are not available; nor are the data available that would permit a reliable estimate to be made of the amount of the reduction in the incidence of salmonellosis in human beings (via red meat and poultry) that should be expected as a result of eliminating salmonella from rendered products and finished feed."

### Center for Disease Control

FDA, Agriculture, and the 50 States regularly report laboratory findings of salmonella to the Center where statistics on the disease are compiled and certain outbreaks are investigated to determine the source of infection.

The Center advised us in April 1973 that much human salmonellosis relates directly, or indirectly, to salmonella-contaminated animal feeds. It believes that a program to control salmonella in animal feeds would contribute significantly to reduce human salmonellosis.

On the basis of investigation of a recent outbreak of human salmonellosis and review of other available information, the Center stated that:

" \* \* \* It is indeed a paradox that industry and public health authorities knowingly permit animals to eat salmonella in feeds which, in turn, find their way to humans in food derived from these animals. \* \* \*"

The Center also feels that:

"The animal-feed cycle of salmonellosis accounts for many of the human cases in the United States \* \* \*. Therefore we recommend that strong effective action be taken at the federal level to control salmonella contamination of rendered products and other protein sources which introduce salmonella into the animal-feed cycle."

## Other opinions

According to seven academicians, some of whom were members of the National Academy of Sciences' committee that evaluated the salmonella problem for FDA and Agriculture, more can be done to reduce human salmonellosis. Most believed that eliminating salmonella from rendered products and finished feeds would be a step in the right direction but cautioned that other factors, including improved animal husbandry procedures and good sanitary practices in slaughter houses and other meat and poultry distribution channels, are necessary if human salmonellosis through raw meat and poultry is to be controlled.

According to the committee chairman, eliminating salmonella from rendered products and finished feeds alone would have little, if any, effect in reducing human salmonellosis. He told us that, even if animal contamination were greatly reduced, the organism could spread during slaughtering from one carcass to another and thus offset any reduction.

In contrast, an official from the School of Public Health at a large southwestern university believes salmonellosis can be effectively controlled by eliminating salmonella from rendered products and finished feeds.

## FEDERAL EFFORTS TO REDUCE SALMONELLA

These efforts have been piecemeal due to the problem's complexity, the high estimated cost of a comprehensive approach to significantly reduce salmonella in the food chain, and the uncertainty that such an approach would significantly reduce the prevalence of human salmonellosis. As a result, certain industry segments are regulated for salmonella contamination and others are not.

### Domestic rendered products

Rendered or protein-based products are manufactured by about 865 rendering plants, and about 2 million tons are produced annually in the United States. Products inadequately processed can contaminate animal feeds.

In 1963 APHIS met with industry officials to discuss voluntary procedures aimed at eliminating salmonella from rendered products. In 1967 FDA issued regulations (21 CFR 135.105) requiring that salmonella-contaminated animal feeds and rendered products be considered adulterated under the FD&C Act.

FDA is responsible for regulating the rendering industry, and in 1967 it entered into an agreement<sup>1</sup> with APHIS whereby APHIS would cooperate with State officials and the rendering industry to have rendering plants voluntarily eliminate salmonella from their products. APHIS established sanitation guidelines for the rendering industry. Plants which either did not want to participate or did not comply with APHIS' guidelines were to be referred to FDA for regulatory control. About 125 were referred to FDA. The remaining 740 participated in APHIS' voluntary program, which included routine testing of finished products for salmonella.

Although many plants--both participating and nonparticipating--were producing salmonella-contaminated products, no regulatory actions were taken against participating plants because in most cases their violations were not referred to

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<sup>1</sup>The agreement was made between FDA and the Animal Health Division, Agricultural Research Service. In April 1972 APHIS assumed responsibility for the program.

FDA. According to laboratory results, about 40 percent of the 740 participating plants were producing salmonella-contaminated products.

FDA took regulatory actions against 12 of the 125 non-participating plants. These actions consisted of 5 injunctions prohibiting shipment in interstate commerce, 2 prosecutions, and 12 seizures involving about 810,000 pounds of rendered products. About 790,000 pounds were reconditioned under FDA supervision and 20,000 pounds were destroyed.

The following examples illustrate the difference in treatment provided two plants that produced salmonella-contaminated products.

#### Plant A

In September 1970 this plant declined to participate in the voluntary program and was referred to FDA for monitoring and regulatory control in February 1971. FDA inspected the plant five times between April 1971 and February 1973 and found insanitary conditions each time. The products were sampled on four occasions, and salmonella contamination was found in three instances. In total, about 20 percent of the samples were contaminated. Therefore, FDA took the following actions:

- The plant was enjoined from shipping salmonella-contaminated products in interstate commerce.
- About 110,000 pounds of salmonella-contaminated products were seized and reconditioned under FDA supervision.

In February 1973 a plant A official told FDA that FDA requirements were unrealistic and had forced the plant out of the rendering business in December 1972. He believed most rendering plants do not comply with FDA's requirements.

#### Plant B

This plant elected to participate in APHIS' voluntary program in late 1968. From January 1969 through April 1972, salmonella was found during each of the 11 times products were examined. In total, about 25 percent of the samples

were contaminated. According to APHIS inspection records, this firm had insanitary conditions over an extended period and had not developed an inplant sanitation plan, though required under the program. Even though this plant had problems similar to those of plant A, the plant was not referred to FDA for regulatory action.

#### Termination of voluntary program

In June 1972, after spending 5 years and about \$2.1 million, APHIS terminated its participation in the program. APHIS said it showed the rendering industry how to free its plants of salmonella but did not have the authority to make the industry comply with APHIS guidelines to produce a salmonella-free product. APHIS also advised us that the rate at which members of the industry were complying was slowed to such a degree that continued expenditures could not be justified.

Both House and Senate Appropriations Committees, in reporting on Agriculture's fiscal year 1973 appropriations, expressed interest in having APHIS and FDA continue their cooperation in cleaning up the salmonella problem in the rendering industry. However, Agriculture used the \$300,000 the Congress appropriated in fiscal year 1973 for other purposes. Specific funds for continuing its program in the rendering industry were not provided to Agriculture in fiscal year 1974, but the House Appropriations Committee, in reporting on Agriculture's fiscal year 1974 appropriation, directed it to continue work in this area. The Committee report stated that:

"The Committee does not agree with the decision to discontinue the salmonella program for which the Congress added \$300,000 last year, and directs the Department to continue work in this area. The Food and Drug Administration testified that salmonella associated problems cause millions of illnesses and cost hundreds of millions of dollars per year."

#### Imported rendered products

Imported rendered products are sampled and tested for salmonella. If salmonella is found, the imported lot is rejected and must be reconditioned before being allowed into

the country. During 1971 and 1972 about 35 million and 65 million pounds, respectively, of imported rendered products were found to be salmonella contaminated.

### Feed products

FDA has regulatory responsibility for about 12,000 animal feed plants. Approximately 60 million tons of commercial animal feed are produced annually in the United States. Although the rendering industry has been subject to either APHIS' voluntary compliance program or FDA's regulatory control, there has been no salmonella-monitoring program for the feed industry.

In a December 1967 planning document, FDA explained why it treated these industries differently:

"\* \* \* At this time we wish to concentrate our resources on the contaminated protein base and have announced to the industry that we are not sampling finished feeds for Salmonella. However, when the incidence of contamination is reduced in by-products, attention will be given to feeds."

In 1966 Agriculture undertook the most current study showing the contamination level that may be in the finished feed industry. According to laboratory analyses of 5,769 finished feed samples collected at 724 feed mills in 26 States, 102, or about 14 percent, of the plants were producing salmonella-contaminated feeds. APHIS said in August 1973 that this contamination rate may be low because some samples contained animal medication which could have prevented the detection of salmonella. About two-thirds of the Nation's commercial feed production contains medication.

### Food for human consumption

Both APHIS and FDA are responsible for insuring that foods for human consumption are not salmonella contaminated. APHIS is responsible for the Nation's raw and processed meat and poultry supply. FDA monitors virtually the rest of the food industry.

### Processed foods

FDA has concentrated on inspecting plants that process food for human consumption, other than meat and poultry, which have a high risk for salmonella contamination. From 1970 through 1972 FDA analyzed about 3,200, 2,900, and 1,300 samples, respectively, of processed food for salmonella. Regulatory actions during the 3-year period ending June 1973 involved 14 seizures, 1 injunction, and 3 prosecutions. Two firms were issued citations, and 32 voluntary recalls were initiated. FDA advised us that current surveys of processed foods under its regulatory control show little salmonella contamination because of increased industry awareness and care resulting from FDA actions.

APHIS has monitored cooked, ready-to-eat meat and poultry products for salmonella contamination. From 1970 through 1972, APHIS analyzed about 1,500, 1,100, and 1,500 samples, respectively, of these products. Twenty-five of the 1970 samples contained salmonella which resulted in several voluntary recalls by industry. In 1971 and 1972, salmonella contamination was negligible and required no regulatory actions.

### Raw meat and poultry

APHIS advised us that salmonella is just one of several bacteria which can contaminate raw meat and poultry and that it attempts to control the problem by having resident inspectors monitor plant sanitary conditions and inspect raw meat and poultry products. APHIS does not routinely test raw meat and poultry products for salmonella. APHIS officials advised us that its inspectors perform visual ante and post mortem inspections to detect obviously ill animals or contaminated carcasses. However, in most cases salmonella-contaminated animals and processing equipment can be identified only through laboratory analysis.

APHIS said its inspection program considers the adequacy of plant (1) facilities and equipment, (2) sanitation, (3) water potability, (4) sewage disposal, and (5) operating practices, such as temperature controls and inspection requirements.

According to a survey of 77 slaughtering plants conducted by a private laboratory for Agriculture during 1967

and 1968, 277, or 3.8 percent, of 7,255 samples of edible meat and poultry contained salmonella. The survey results are summarized below.

	Number of samples analyzed	Salmonella found	
		Number	Percent
Chicken	1,903	67	3.5
Turkey	1,034	12	1.2
Pork	2,186	169	7.7
Beef	1,429	20	1.4
Lamb	<u>703</u>	<u>9</u>	<u>1.2</u>
Total	<u>7,255</u>	<u>277</u>	3.8

During the same period, Agriculture surveyed the same chicken-slaughtering plants and found that 170, or 28.5 percent, of the 597 whole chickens contained salmonella. This rate was about eight times greater than that found by the private laboratory. Agriculture attributed the difference to analyzing whole chickens instead of chicken pieces as the private laboratory did.

APHIS, in declining our request to analyze salmonella contamination at slaughtering plants, advised us in August 1972 that, in its opinion, the 1967-68 study results represented current conditions.

### Live animals

#### Livestock and poultry

Even though livestock and poultry are often salmonella contaminated, there is no Federal program to prevent the interstate shipment of contaminated animals. According to APHIS, many animals carry the bacteria as a normal constituent. Agriculture cooperates with States in a voluntary National Poultry Improvement Plan, whose major objective is to produce salmonella-free chicks for breeding. Efforts are directed at eradicating three important types of salmonella. Two have been essentially eliminated from commercial poultry breeding flocks, but only limited progress has been made with the third. The Agricultural Research Service of the Department of Agriculture advised us that eliminating other types of salmonella is impractical and

unworkable at present, partly because feed manufacturers cannot insure that feed products are salmonella free.

#### Pet turtles

In July 1973 FDA initiated a regulatory program (42 CFR 72.26) requiring pet turtles, including tortoises, terrapins, and certain related animals, to be certified salmonella free before they are shipped in interstate commerce. Shippers' failure to comply can result in legal sanctions.

#### FDA and APHIS studies

In February 1972, we discussed with FDA and APHIS officials our review of their programs to control salmonella in raw meat and poultry. In November 1972 and February 1973, APHIS and FDA, respectively, established internal task forces to review the problem.

In releasing the task forces' reports in August 1973, HEW and Agriculture officials advocated, among other things:

- Continuation of a cooperative Federal-State-industry program coordinated by FDA to eliminate salmonella from rendered animal by-products used in animal feeds.
- Modification of processing procedures and facilities in meat and poultry plants under Agriculture's inspection to reduce bacterial cross-contamination of products and equipment.
- Intensified support of industry and Agriculture-financed research aimed at controlling and eliminating salmonella throughout the food chain.
- FDA development of model ordinances governing sanitation and food handling in retail stores and food service institutions and of sanitation standards for the food transportation industry.
- Expansion and coordination of an intensive consumer education campaign aimed at eliminating careless food-handling practices in the home and food service establishments.

Chapter 4 discusses additional comments on expanding and coordinating a consumer education program. Chapter 5 presents our conclusions and recommendations and agency comments on matters in this chapter.

## CHAPTER 4

### CONSUMER EDUCATION--A PRACTICAL

### SAFEGUARD AGAINST SALMONELLOSIS

#### IMPORTANCE OF CONSUMER EDUCATION

Although FDA and APHIS view consumer education as an essential and practical safeguard against salmonellosis, their programs to inform the public on such safeguards need to be improved. Generally these programs do not identify those groups having the greatest need for such information. In addition, FDA and APHIS have not periodically evaluated their programs' effectiveness. The National Academy of Sciences' study of the salmonella problem, completed in 1969, made recommendations to strengthen these agencies' consumer educational efforts.

In October 1972 an FDA official advised us that FDA has a mandate to inform the consumer about salmonella. As noted earlier, the Administrator, APHIS, in February 1973 advised us that, until new information shows a more effective way to deal with the salmonella problem, APHIS believes it can do the most good by stressing plant sanitation. According to the Administrator, APHIS will also actively support a dynamic educational program to inform handlers of raw meat and poultry (including housewives) of the precautions they should take when handling these products.

Because of the task forces formed by FDA and APHIS during our review, HEW and Agriculture in August 1973 advocated expanding and coordinating an intensive consumer education campaign aimed at eliminating careless food-handling practices in the home and food service establishments.

The importance of consumer education was further demonstrated in a recent court ruling by the U.S. District Court for the District of Columbia. The American Public Health Association filed suit charging that Agriculture officials failed to require that labels on meat and poultry products be complete and accurate so as to inform consumers of possible bacterial contamination and of necessary precautions against the dangers of food poisoning and infection from such contamination. Salmonella was the major bacterial contaminant described in the suit.

The court found that Agriculture's decision to embark upon a nationwide education program recognized the difficulty of controlling salmonellosis and other food poisoning because of its many sources and because it spreads easily.

The court concluded that:

"\* \* \*The Secretary of Agriculture's decision that only through a nation-wide education program can consumers be adequately informed so as to take appropriate precautions against salmonellosis and other food poisoning is a reasonable one. It is enough that the Secretary has acted within the statutory bounds of his authority, and that his choice among possible alternative standards adapted to the statutory end is one which a rational person could have made."

The decision was appealed in January 1973 and was still pending as of April 1974.

#### CONSUMER EDUCATION EFFORTS

FDA and APHIS, in their consumer education programs, stress the importance of strict sanitary practices when handling and preparing raw meat and poultry. They recommended that equipment, utensils, cutting boards, and hands, after touching raw meat and poultry, be washed before coming in contact with other food. For example, a housewife should clean thoroughly, with hot soapy water, any utensil that touches raw meat and poultry before it is used for another food.

To educate consumers FDA and APHIS use various methods, including discussions with consumer groups, television and radio broadcasts, newspaper articles, and pamphlets stressing proper care and handling of meat and poultry products. In October 1972, an APHIS official said the foundation of APHIS consumer education programs rested on five information pamphlets, of which 1.7 million copies were printed, including 40,000 copies in Spanish. FDA estimates that its regional consumer affairs officers may have reached about 20 million consumers through television, radio, and other news media.

Because the consumer education programs encompass more than the salmonella problem, the costs of educating consumers on safeguards against salmonella are not known.

#### CONSUMER KNOWLEDGE OF THE SALMONELLA PROBLEM

FDA and APHIS rely extensively on consumers to safeguard themselves against the hazards from salmonella-contaminated raw meat and poultry products. Although FDA and APHIS believe that their consumer education efforts have had some success, they have not measured it. Therefore, we contracted with The Gallup Organization, Inc., to determine the number of women who:

--Know what salmonella is.

--Know how to minimize the spread of salmonella that may be present in raw meat and poultry that are brought home.

--Believe that raw meat and poultry are inspected for salmonella.

In April 1973, a national sample of 816 women were interviewed. According to Gallup, study results are projectable to the women 18 years of age and older--about 73 million (See app. III.)

The poll showed that (1) 74 percent, or approximately 54 million, did not know that salmonella is a bacteria which may cause food poisoning, (2) 66 percent, or approximately 48 million, did not know how to minimize the spread of salmonella within the home, and (3) 39 percent, or approximately 28 million, were certain that raw meat and poultry on the market are inspected by Federal or State inspectors for salmonella--when in fact, they are not. Questions asked and a summary of the responses follow.

	<u>Answered</u>	<u>Percent (note a)</u>
1. Could you tell me what salmonella is? (Respondents were given seven answers to choose from, one of which was correct.)	Correctly	26
	Incorrectly or didn't know	74
2. Do you know how to minimize the spread of salmonella bacteria that may be present in raw meat and poultry that are brought home?	Yes	34
	No or don't know	66
3. To the best of your knowledge, has raw meat and poultry which you purchased been inspected by Federal or State inspectors for the presence of salmonella bacteria?	Yes--certain	39
	No or don't know	61

<sup>a</sup>Gallup said these percentages are accurate, within  $\pm$  4 percentage points at the 95-percent level of confidence.

#### TARGET GROUPS CAN BE IDENTIFIED FOR INTENSIFIED EDUCATION

Gallup gave us certain demographic data, such as educational level, household income, age, size of community, and State of residence, about the Nation's women. FDA and APHIS could use such data, along with the responses to the questions, to identify target groups requiring intensified consumer education. Communicating directly with target groups can supplement a broader consumer educational effort.

#### Educational level

The Gallup survey showed that a large percentage of women, regardless of the level of education, did not know what salmonella was and did not know how to minimize the spread of salmonella that may be in raw meat and poultry. However, the lower the level of education, the less women knew about salmonella. The following table summarizes the survey results by educational levels.

	<u>Millions of women</u>	<u>Incorrectly identified salmonella</u>		<u>Do not know how to minimize the spread of sal- monella in raw meat and poultry brought home</u>	
		<u>Millions of women</u>	<u>Percent</u>	<u>Millions of women</u>	<u>Percent</u>
College attendee	16	10	61	9	54
High school graduate	30	21	70	18	62
High school incomplete	14	11	82	10	72
Grade school	<u>13</u>	<u>12</u>	<u>89</u>	<u>11</u>	<u>86</u>
Total	<u>73</u>	<u>54</u>	74	<u>48</u>	66

#### Household income

The Gallup survey data shown below indicates that, of the 15 million women from the lowest income households, 89 percent, or about 14 million, incorrectly identified salmonella; 81 percent of this group, or about 13 million, did not know how to minimize the spread of salmonella in raw meat and poultry.

<u>Household income</u>	<u>Millions of women</u>	<u>Incorrectly identified salmonella</u>		<u>Do not know how to minimize the spread of sal- monella in raw meat and poultry brought home</u>	
		<u>Millions of women</u>	<u>Percent</u>	<u>Millions of women</u>	<u>Percent</u>
Under \$4,000	15	14	89	13	81
\$4,000 to \$6,999	13	10	81	9	73
\$7,000 to \$9,999	12	8	73	6	55
\$10,000 to \$14,999	19	13	66	12	63
\$15,000 and over	<u>14</u>	<u>9</u>	<u>62</u>	<u>8</u>	<u>57</u>
Total	<u>73</u>	<u>54</u>	74	<u>48</u>	66

Poultry products generally are more attractive to the lowest income groups because they are less expensive than red meats. However they are also more frequently contaminated with salmonella. Thus the lowest income groups may be identifiable target groups of particular significance in controlling the spread of salmonella.

Age of women

The Gallup survey data below indicates that, of the 12 million women 61 years of age and over, 74 percent, or 8 million did not know how to safeguard against salmonella in raw meat and poultry.

<u>Age</u>	<u>Millions of women</u>	<u>Do not know how to minimize the spread of salmonella in raw meat and poultry brought home</u>	
		<u>Millions of women</u>	<u>Percent</u>
18 to 34	27	20	73
35 to 49	20	12	61
50 to 60	14	8	55
61 and over (note a)	<u>12</u>	<u>8</u>	<u>74</u>
Total	<u>73</u>	<u>48</u>	66

<sup>a</sup>The elderly may be of particular significance because they are among those most susceptible to salmonellosis.

Chapter 5 contains our conclusions and recommendations and agency comments on matters in this chapter.

## CHAPTER 5

### CONCLUSIONS, RECOMMENDATIONS, AGENCY COMMENTS

#### AND OUR EVALUATION

##### CONCLUSIONS

Raw meat and poultry products being sold to the public are often salmonella contaminated and pose a serious potential health problem. Contamination is highest in chicken and pork and lowest in lamb, turkey, and beef.

Although Federal laws prohibit the sale of contaminated products, FDA said it has never instituted a retail testing program for salmonella in raw meat and poultry because Agriculture, with its statutory authority and resources, can better assess and control salmonella in these products. According to APHIS, Federal regulatory action at the retail level is not feasible or economical.

These agencies, responsible for the safety of the Nation's food supply, rely extensively on public education programs to inform consumers of ways to safeguard against this potentially harmful bacteria. These programs need to be improved.

Controlling salmonellosis is complex because the bacteria is widely distributed in the environment and can reach man in many ways. According to a study by the National Academy of Sciences, it is unreasonable to expect salmonellosis to be eradicated in the foreseeable future, but it could be substantially reduced if the problem is attacked along a broad front. The Academy made recommendations to achieve timely control of salmonellosis.

FDA believed the recommendations were valid and, within limits, feasible to implement. According to APHIS, the recommendations were overwhelming in magnitude and cost, particularly because there was no insurance that such a program would greatly reduce human salmonellosis.

FDA and APHIS are uncertain whether controlling salmonella in rendered products and animal feeds will reduce human infection. Yet, the Center for Disease Control believes that a program to control salmonella in animal feeds will contribute significantly to reducing human salmonellosis.

Federal efforts have been piecemeal because of the problem's complexity, the high estimated cost of undertaking a comprehensive approach to significantly reduce salmonella in the food chain, and the uncertainty that such an approach would significantly reduce the prevalence of human salmonellosis. These efforts have not had a major impact in controlling salmonella and have resulted in certain industry segments being regulated for salmonella contamination while others are not.

Some rendering plants, the processed foods industry, and the pet turtle industry are being regulated. Although salmonella contamination is generally high in animal feeds, livestock, poultry, and raw meat, these industries are not monitored for salmonella.

In August 1973 HEW and Agriculture task forces made several recommendations which, if implemented, could better control salmonella in raw meat and poultry. (See p. 21.) As of March 1974 the recommendations had not been fully implemented.

#### RECOMMENDATIONS TO THE SECRETARIES OF HEW AND AGRICULTURE

We recommend that these Secretaries:

- Implement the task forces' recommendations to achieve more timely and effective control of the salmonella problem. After considering the practical limitations for controlling salmonella, they should establish goals, time frames, and estimated costs for implementing the recommendations.
- Cooperate in a program to assess the extensiveness of salmonella-contaminated raw meat and poultry products (by product type) on the market. Once a baseline has been established, periodic national samples should be taken to monitor any change in contamination levels. Such information would be useful in determining whether Federal programs to control salmonella are successful.
- Emphasize to consumers the serious potential health problem associated with handling raw meat and poultry, particularly chicken and pork, and the precautions in

handling them. Consumers should be made aware that these products have the highest rate of contamination, and that lamb, turkey, and beef are less contaminated.

--Periodically measure the effectiveness of their consumer education programs. To supplement a broader educational effort, consideration should be given to identifying target groups, such as the elderly, to which intensified consumer education should be directed.

#### AGENCY COMMENTS AND OUR EVALUATION

HEW and Agriculture agreed with most of our recommendations. (See apps. IV and V.) In view of the difficulty in eliminating salmonella from raw meat and poultry HEW pointed out that current FDA resources cannot significantly impact on the salmonella problem unless such resources are complemented by the State governments, the industries involved, and other Federal agencies.

Agriculture agreed that salmonella, which ranks third among reported bacterial causes of food-borne disease in man, is an important food contaminant in raw meat and poultry and requires Agriculture's continuing efforts toward control and consumer education. Agriculture believes, however, its efforts should be directed at bacterial contamination in its entirety rather than at any one type of bacteria.

Although Agriculture does not consider its efforts piecemeal, it pointed out that, due to resource limitations, it has not been able to carry out an unlimited effort against all avenues of contamination. Therefore, it has concentrated on processed meat and poultry products, improved industry sanitation procedures, and consumer education as they seem to have the most potential benefit. Agriculture said that if the Federal Government is committed to a primary objective to significantly reduce the prevalence of salmonella in the population, Agriculture will assist in reaching such a goal.

HEW and Agriculture's comments on each of our recommendations are summarized below.

Implementation of task  
forces' recommendations

HEW stated that our conclusions correspond with the recommendations made by the National Academy of Sciences' Committee on Salmonella and FDA's Salmonella Task Force and stated that FDA has taken steps to implement these recommendations. The task force recommended that FDA (1) intensify consumer educational efforts and strengthen its related cooperation with Agriculture, (2) encourage the continued participation of the States and industry in the Voluntary Cooperative Industry-State-Federal Salmonella Program, and (3) expedite development of regulatory initiatives to control salmonella.

With respect to each of the FDA task force recommendations HEW stated that:

- FDA has taken steps to intensify consumer education efforts related to safe food handling. Through joint efforts with Agriculture, FDA published two pamphlets in January 1974 dealing with the handling of foods and the facts about food poisoning.
- FDA has continued its role in the Voluntary Cooperative Industry-State-Federal Salmonella Program.
- FDA is preparing regulations covering food service sanitation and retail food stores which address causes of salmonella contamination. These proposed regulations will be published in the Federal Register in 1974. FDA will explore the feasibility of regulations and standards for controlling microbiological contamination of foods shipped in bulk.

Agriculture stated that it was actively pursuing the goals suggested by the task forces and that our recommendations will strengthen its effort in soliciting understanding and cooperation from industry.

Agriculture advised us that:

- It has recently increased its consumer education program activities with the distribution, or plans for distribution, of special materials to the public as well as to radio and television stations for public service announcements.

- Several actions have been taken or are under consideration which will strengthen its bacteria control measures to prevent cross-contamination of products and equipment in meat and poultry plants.
- Its Agricultural Research Service will direct research to improving methods of controlling and eliminating salmonella in meat, poultry, and food processing plants.

Assessment of salmonella-contaminated meat and poultry products on the market

Although HEW and Agriculture indicated the need to periodically evaluate their program efforts to reduce the incidence of human salmonellosis, they believe it would be difficult to assess a small change in the prevalence of salmonella in raw meat and poultry on the market because of several variables which could affect such assessment. HEW stated that FDA believes the incidence of salmonella in raw meat and poultry has been firmly established by many past studies, such as those cited in our report, which showed that the level of incidence varied widely. Agriculture stated that it would be difficult to trace changes in the prevalence of salmonella to a particular set of actions; however, it would welcome the opportunity to cooperate with FDA in any assessment program focusing on bacteria contamination.

As cited in our report FDA and APHIS identified eight studies concerning salmonella-contaminated raw meat and poultry at the retail market level. (See p. 7.) The studies were local in that samples were collected in only one city in each case, and in some cases the studies were limited to one product. Therefore, in our view, they would not serve as national indicators of the extent of salmonella-contaminated raw meat and poultry on the market.

Also, FDA believes that currently available statistics on food-borne illness can be used to evaluate its program's effectiveness. According to FDA officials, the primary source for such statistics would be those gathered and reported annually by the Center for Disease Control.

These statistics, in our opinion, would not provide an adequate basis for evaluating the effectiveness of Federal programs to control salmonella. According to the Center, interpretations of its salmonella statistics are limited by the bias inherent in the data analyzed and such factors as the lack of adequate laboratory facilities in some areas which influence the statistics. Also, the National Academy of Sciences, in its report on the salmonella problem noted that the Center's statistics represent only a small fraction (about 10 percent) of the total salmonella food-borne outbreaks in the United States.

Therefore, we believe the use of periodic national samples would provide a more reliable basis upon which to determine changes in the levels of salmonella in raw meat and poultry and evaluate the effectiveness of Federal programs to control salmonella in these products before they reach the consumer.

Emphasize potential health problems  
and precautions required in handling  
raw meat and poultry

HEW pointed out that consumer education pamphlets developed jointly by FDA and Agriculture mention prominently that special care should be taken in handling and preparing chicken and pork. These pamphlets will be actively promoted and distributed free by FDA, Agriculture, and the General Services Administration's Consumer Product Information Center.

According to HEW, FDA has designated salmonella and other food-borne illnesses as a priority topic for field education efforts in fiscal year 1974. As a result, FDA consumer specialists throughout the country will be emphasizing prevention of food-borne illnesses in their contacts with local education and civic organizations and media sources.

Agriculture believes that, rather than focusing on specific meat and poultry products, there is a general need for all elements of the food production-processing-marketing chain to focus on eliminating all possible sources of bacterial contamination, including but not limited to salmonella. According to Agriculture, primary emphasis should be placed on food safety precautions in all forms and to all segments of the public.

We agree that food safety precautions in all forms are important. However, in view of the high incidence of salmonella contamination in chicken and pork, we believe the consumer should be alerted to the importance of exercising prescribed precautions in handling these products.

Measurement of effectiveness  
of consumer education efforts

HEW advised us that FDA routinely measures the effectiveness of its various consumer education efforts in several ways, such as direct feedback from FDA's consumer specialists and mass media contacts. HEW stated that FDA also conducts periodic national surveys to determine consumers' knowledge or use of products FDA regulates and that, in the future, questions will be included in these surveys to assess the impact of consumer education efforts in controlling food-borne illness.

HEW stated that, although FDA's major consumer education efforts will be directed at the general population, FDA's consumer specialists will tailor their information to suit the needs of particular audiences.

Agriculture agreed with our report on the wisdom of and necessity for evaluating consumer education programs and believes that this should be a continuing function. Agriculture said its Statistical Reporting Service is currently pretesting an extensive questionnaire which deals with the subject of food safety. It hopes that the results from this questionnaire will augment future consumer education program planning.

Agriculture believes that educational materials for the general public are in greater need than those for certain limited groups. However, discussions with officials and supplemental information provided with Agriculture's comments on matters discussed in our report indicate that it has developed food safety educational information for specific target groups, such as those in school lunch and needy family feeding programs. Agriculture also indicated that it plans to develop similar information for other target groups.

## CHAPTER 6

### SCOPE OF REVIEW

Our review included:

- Reviewing pertinent Federal laws, regulations, policies, and procedures to prevent salmonella contamination of human and animal foods.
- Examining records and interviewing officials at FDA and Agriculture headquarters and at selected field activities.
- Discussing the salmonella problem with officials of the Center for Disease Control, authors of published articles on the subject, and academicians.
- Reviewing a study of the salmonella problem undertaken by the National Academy of Sciences and interviewing various members of the study team.

At our request, FDA collected and analyzed 200 samples of raw meat and poultry for salmonella contamination. These products were purchased at retail stores in 10 metropolitan areas of the country where 23 percent of the population resides.

We retained The Gallup Organization, Inc., to interview a national sample of women to determine what they knew about salmonella and the precautions they should use to minimize the spread of salmonella in raw meat and poultry brought home.

SELECTED GAO REPORTS TO THE CONGRESS  
OR CONGRESSIONAL COMMITTEES CONCERNING  
CONSUMER PROTECTION AGAINST POTENTIALLY HARMFUL FOODS

Enforcement of Sanitary, Facility, and Moisture  
Requirements at Federally Inspected Poultry Plants  
(B-163450, Sept. 10, 1969)

Weak Enforcement of Federal Sanitation Standards at  
Meat Plants by the Consumer and Marketing Service  
(B-163450, June 24, 1970)

Consumer and Marketing Service's Enforcement of Federal  
Sanitation Standards at Poultry Plants Continues to be  
Weak (B-163450, Nov. 16, 1971)

Better Inspection and Improved Methods of Administration  
Needed for Foreign Meat Imports  
(B-163450, Feb. 18, 1972)

Dimensions of Insanitary Conditions in the Food  
Manufacturing Industry  
(B-164031(2), Apr. 18, 1972)

Lack of Authority Limits Consumer Protection: Problems  
in Identifying and Removing from the Market Products  
Which Violate the Law  
(B-164031(2), Sept. 14, 1972)

An Incident of Contamination of Livestock Feed and  
Certain Consumer Products  
(B-164031(2), Dec. 1, 1972)

Processed Fruits and Vegetables:

--Potentially Adulterated Products Need to be Better Con-  
trolled

--Sanitation in Some Plants Needs Improvement  
(B-164031(2), Feb. 21, 1973)

Protecting the Consumer from Potentially Harmful Shell-  
fish (Clams, Mussels, and Oysters)  
(B-164031(2), Mar. 29, 1973)

Consumer Protection Would be Increased by Improving the  
Administration of Intrastate Meat Plant Inspection Pro-  
grams (B-163450, Nov. 2, 1973)

## APPENDIX II

### STUDIES THAT IDENTIFY SALMONELLA-CONTAMINATED RAW MEAT AND POULTRY PRODUCTS AT THE RETAIL LEVEL

#### Reference

- Atlanta, Ga. J.H. Richardson, M.M Galton, and L.E. Starr, "Potential Bacterial Pathogens in Retail Market Foods," presented at the American Veterinary Medical Association Meeting, Denver, Colorado, August 1960 (not submitted for publication).
- Cincinnati, Ohio E. Wilson, R.S. Paffenbarger, Jr., M.J. Fotet, and K.H. Lewis, "Prevalence of Salmonellae in Meat and Poultry Products," Journal of Infectious Diseases, vol. 109 (1961), pp. 166-171.
- Lafayette, Ind. M. Woodburn, "Incidence of Salmonella in Dressed Broiler-Fryer Chickens," Applied Microbiology, vol. 12 (1964), pp. 492-495.
- Boston, Mass. A.N. Wilder and R.A. MacCready, "Isolation of Salmonellae from Poultry," The New England Journal of Medicine, vol. 274 (1966), pp. 1453-1505.
- Athens, Ga. M.A. Weissman and J.A. Carpenter, "Incidence of Salmonellae in Meat and Meat Products," Applied Microbiology, vol. 17 (1969), pp. 899-902.
- Cincinnati, Ohio J.W. Messer and others, Microbiological Quality Survey of Some Selected Market Foods in Two Socioeconomic Areas," Bacteriological Proceedings, 1970, p. 12.
- Atlanta, Ga. G.W. Morris and C.G. Dunn, "Influence of Incubation Temperature and Sodium Heptadecyl Sulfate on the Isolation of Salmonellae from Pork Sausage," Applied Microbiology, vol. 20 (1970), pp. 192-195.
- Starkville, Miss. M. Kennedy, "The Incidence of Salmonella in Certain Food Products in Market Channels in the Southern States." Department of Biochemistry, Mississippi Agricultural and Forestry Experiment Station, Mississippi State University (unpublished data).

BEST DOCUMENT AVAILABLE

EXCERPTS FROM THE GALLUP ORGANIZATION, INC.,  
REPORT ABOUT WOMEN'S KNOWLEDGE CONCERNING THE  
CONTROL OF THE SPREAD OF SALMONELLA WITHIN THE HOME

HIGHLIGHTS OF THE REPORT

Seventy-four percent of all women 18 and older could not correctly identify salmonella -

- 89% among grade school
- 82% among high school incomplete
- 70% among high school graduates
- 61% among college attenders

Thirty-nine percent of all women believe raw meat and poultry are inspected by Federal or State inspectors for salmonella bacteria.

Sixty-six percent of all women say they do not know how to minimize the spread of salmonella bacteria within the home.

Six percent of all women mentioned washing hands, food, or utensils as a way of minimizing spread of salmonella within the home -

- 12% of all women who correctly identified salmonella
- 3% of all women who could not identify salmonella

— The Gallup Organization, Inc. —

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# APPENDIX III

## COMPOSITION OF THE SAMPLE

	<u>Percent</u>
All Women	100.0
 <u>Age of Respondent</u>	
18 to 34 years	37.3
35 to 49 years	26.6
50 years and older	35.5
Undesignated	<u>.6</u>
	100.0
 <u>Education</u>	
College	21.7
High School Graduate	40.8
High School Incomplete	18.9
Grade School	18.1
Undesignated	<u>.5</u>
	100.0
 <u>Annual Family Income</u>	
\$15,000 and over	19.1
\$10,000 to \$14,999	24.8
\$7,000 to \$9,999	15.0
Under \$7,000	37.2
Undesignated	<u>3.9</u>
	100.0
 <u>Size of Community</u>	
1,000,000 and over, including urban fringe	17.4
250,000 to 999,999, including urban fringe	21.3
50,000 to 249,999, including urban fringe	17.0
2,500 to 49,999	17.3
Under 2,500	<u>27.0</u>
	100.0

Continued . . .

*— The Gallup Organization, Inc. —*

BEST DOCUMENT AVAILABLE

Continued . . .

	<u>Percent</u>
<u>Occupation of the Chief Wage-Earner</u>	
Professional & Business: Professional, technical and kindred workers (e.g., engineers, accountants, nurses); Executives (managers, officials, proprietors, public administrators)	22.1
Clerical & Sales: Clerical and kindred workers (e.g., mail carriers, telephone operators); Sales and kindred workers (e.g., retail clerks, claims examiners)	11.6
Manual Workers: Foremen, craftsmen and kindred workers (e.g., railroad engineers, machinists, linesmen, maintenance painters); Operatives and kindred workers (e.g., coal miners, truck drivers, butchers, apprentices); Service workers, Laborers	40.1
Farmers: Farm owners, farm managers, farm foremen, farm laborers	3.4
Non-Labor Force	18.6
Undesignated	<u>4.2</u> 100.0
<u>Region of the Country</u>	
East: Maine, New Hampshire, Rhode Island, Connecticut, Vermont, Massachusetts, New York, New Jersey, Pennsylvania, West Virginia, Delaware, Maryland, District of Columbia	27.7
Midwest: Ohio, Indiana, Illinois, Michigan, Minnesota, Wisconsin, Iowa, North Dakota, South Dakota, Kansas, Nebraska, Missouri	27.4
South: Kentucky, Tennessee, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Texas, Arkansas, Oklahoma, Louisiana	27.9
West: Arizona, New Mexico, Colorado, Nevada, Montana, Idaho, Wyoming, Utah, California, Washington, Oregon, Alaska, Hawaii	<u>17.0</u> 100.0

## - N O T E -

Allowance for persons not at home was made by means of a "times-at-home" technique rather than by "call-backs". Either procedure is a standard method for reducing the sample bias that would otherwise result from under-representation in the sample of persons who are difficult to find at home. All results, reported, including the composition of the sample are based on data in which a "times-at-home" weighting has been incorporated. The actual number of interviews made for various population groups are reported in the findings.

*The Gallup Organization, Inc.*

BEST DOCUMENT AVAILABLE

THE QUESTIONNAIRE

GO 7355T

1. (HAND RESPONDENT CARD A) Could you tell me what salmonella is? Please point to the phrase on this card that you think is correct. If you don't know, please don't guess.

- 1( )A I don't know
- 2( )B A virus which causes a respiratory illness
- 3( )C An ingredient which is used in detergents to minimize water pollution
- 4( )D An allergic reaction which results from the use of antibiotic drugs
- 5( )E A bacteria which may cause food poisoning
- 6( )F A preservative which is used in frozen foods
- 7( )G A deadly toxin which is associated with improperly processed canned foods

2. (IF "DON'T KNOW, OR AN ANSWER OTHER THAN "E" IS CHECKED, READ THIS PHRASE: "In fact, salmonella is a bacteria which may cause food poisoning.") To the best of your knowledge, has raw meat and poultry which you purchased been inspected by Federal or State inspectors for the presence of salmonella bacteria?

- 1( )Yes, certain
- 2( )No, not certain
- 3( )No
- 4( )Don't know

3a. Do you know how to minimize the spread of salmonella bacteria that may be present in raw meat and poultry that are brought home?

- 1( )Yes
- 2( )No
- 3( )Don't know

IF "YES" TO Q. 3a, ASK Q. 3b

b. How do you safeguard against salmonella? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Anything else? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

IF "WASHING HANDS, THE FOOD, OR UTENSILS" IS MENTIONED IN Q. 3b, ASK Q. 3c

c. At what times would the washing occur? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
WASHINGTON, D.C. 20201

OFFICE OF THE SECRETARY

MAR 19 1974

Mr. Gregory J. Ahart  
Director  
Manpower and Welfare Division  
General Accounting Office  
Washington, D.C. 20548

Dear Mr. Ahart:

The Secretary has asked that I respond to your request for comments on your draft report to the Congress entitled, "Salmonella in Raw Meat and Poultry: An Assessment of the Problem." Our comments are enclosed.

We appreciate the opportunity to comment on this draft report.

Sincerely yours,

A handwritten signature in cursive script that reads "John D. Young".

John D. Young  
Assistant Secretary, Comptroller

Enclosure

## APPENDIX IV

### SALMONELLA IN RAW MEAT AND POULTRY: AN ASSESSMENT OF THE PROBLEM

#### General

We agree with the major recommendations of the GAO report. It indicates the difficulty in eliminating Salmonella from raw meat and poultry, and it recommends an immediate emphasis on consumer education coupled with a continuation of long-term efforts to reduce the incidence of contamination. In this respect, the conclusions of the GAO report correspond with recommendations made by the Committee on Salmonella at the National Academy of Sciences and the FDA Salmonella Task Force. The Food and Drug Administration has already taken steps to implement these recommendations. It should be noted, however, that the current resources available to FDA for consumer education efforts and the Cooperative Industry-State-Federal Salmonella Program cannot by themselves make a significant impact on the Salmonella problem unless they are complemented by similar initiatives on the part of State governments, the industries involved, and other Federal agencies.

Comments on specific recommendations are as follows:

#### GAO Recommendation

--Implement the FDA Task Force recommendations in order to achieve more timely and effective control of the salmonella problem.

#### Department Comment

The FDA Salmonella Task Force recommended that FDA (1) intensify consumer educational efforts and strengthen related cooperation with USDA, (2) encourage the continued participation of the States and industry in the Voluntary Cooperative Salmonella Program, and (3) expedite development of regulatory initiatives to control Salmonella.

With respect to the first recommendation, collaborative efforts with USDA have produced two pamphlets published in January, 1974. Additional steps taken by FDA to intensify consumer education efforts related to safe food handling are discussed below. In response to the second item, FDA has continued its role in the Voluntary Cooperative Industry-State-Federal Salmonella Program. With respect to regulatory initiatives, FDA is preparing regulations covering food service sanitation and retail food stores which address causes of Salmonella contamination. Both will be published as proposals in the Federal Register in 1974. FDA will also explore the feasibility of regulations and standards to control microbiological contamination in the bulk shipment of food. A meeting between FDA and the American Railway Association scheduled for April, 1974 will discuss this topic.

GAO Recommendation

--Cooperate (with USDA) in a program to assess the extensiveness of salmonella contaminated raw meat and poultry products on the market. Once a baseline has been established, periodic national samples should be taken to monitor any change in the levels of contamination.

Department Comment

FDA believes the incidence of Salmonella in raw meat and poultry has been firmly established by many past studies. As the examples cited in the GAO report illustrate, the level of incidence varies from approximately 10% to 70% depending on the type of meat examined, methodology employed, geographic location, laboratory expertise, etc. Given this degree of variation, it would be difficult and costly to measure a small change in incidence levels over time. FDA believes that currently available statistics on food-borne illness can be used to evaluate the long-run effectiveness of FDA programs to control food-borne illness.

GAO Recommendation

--Emphasize to consumers the potential health problem associated with the handling of raw meat and poultry, with particular emphasis on chicken and pork and the precautions which should be taken in handling these products.

Department Comment

Through joint efforts with USDA, FDA has produced two pamphlets published in January, 1974 dealing with the handling of foods and the facts about food poisoning. These publications mention prominently that special care should be taken in the handling and preparation of chicken and pork. These brochures will be actively promoted and distributed free by USDA, FDA, and the Consumer Product Information Center (GSA). In addition, FDA has prepared and distributed radio and TV spot announcements on safe food handling to thousands of stations in November, 1973. Furthermore, FDA has designated Salmonella and other food-borne illnesses as a priority topic for field education efforts in FY 74. As a result, FDA consumer specialists throughout the country will be emphasizing prevention of food-borne illnesses in their contacts with local education and civic organizations and media sources.

GAO Recommendation

--Periodically measure the effectiveness of their consumer education programs. As a useful supplement to a broader educational effort, consideration should be given to identifying specific target groups to which intensified consumer education should be directed.

Department Comment

FDA routinely measures the effectiveness of various consumer education efforts in several ways. Direct feedback from FDA's consumer specialists and mass media contacts provide an immediate measure of the usefulness of consumer education materials. For example, more than 900 radio stations have already reported that they used the spot announcements provided in November, 1973. FDA also conducted periodic national surveys of consumers to determine their knowledge or use of products regulated by FDA. In the future, questions will be included to assess the impact of consumer education efforts on the control of food-borne illness. FDA will also evaluate statistics on food-borne illness to determine long-term trends in the problem.

With respect to directing consumer education efforts at specific target groups, the GAO survey indicated that a majority of women irrespective of income, education or age were unfamiliar with procedures to minimize the spread of salmonella. Accordingly, the major thrust of FDA's consumer education efforts will be directed at the general population. Of course, consumer specialists will continue to tailor their information to suit the needs of particular audiences.

UNITED STATES DEPARTMENT OF AGRICULTURE  
ANIMAL AND PLANT HEALTH INSPECTION SERVICE  
WASHINGTON, D.C. 20250

Mr. Henry Eschwege  
Director, Resources and  
Economic Development Division  
U.S. General Accounting Office  
Washington, D.C. 20548

APR 1, 1974

Dear Mr. Eschwege:

We appreciate the opportunity to comment on your draft report, "Salmonella in Raw Meat and Poultry: An Assessment of the Problem."

We are in substantial agreement that salmonella is an important food contaminant in raw meat and poultry and as such requires our continuing efforts toward control and consumer education. However, since salmonella ranks third among the reported bacterial causes of foodborne disease in man, we believe our efforts should be directed not at any one type of bacteria but at bacterial contamination in its entirety. In our responses to your specific recommendations and in the attachments to this letter we outline the actions this Agency has taken and will continue to take toward this goal.

Regardless of whether salmonella is treated as the prime threat or as part of a larger problem, resources are not available to carry out an unlimited effort against all possible avenues of contamination. Given that limitation, we must choose among various actions those that seem to hold the most potential benefit. We have chosen to concentrate in the areas of processed meat and poultry products, improved industry sanitation procedures, and consumer education. We believe this represents a rational approach to the problem. We do not consider this a piecemeal effort.

If, however, senior public health officials evaluate salmonella as the prime threat then I would repeat my comments in my February 1973 letter to Mr. Woods which addressed this issue. Appropriate officials should announce the priority the Administration has placed on the situation, call together all the agencies that can help with the problem, have each agency make its needs known, and then provide the necessary resources. Again I assure you that if the government is committed to a primary objective of a significant reduction of the prevalence of salmonella in the population, you will not find this Agency and Department lacking in their commitment to assist in reaching that goal.

## APPENDIX V

Mr. Henry Eschwege

### Response to Specific GAO Recommendations.

#### 1. Recommendation

"Implement the task forces' recommendations in order to achieve more timely and effective control of the salmonella problem."

#### Comment

We concur with this recommendation and have been actively pursuing the goals suggested by the task forces. Our emphasis is not on salmonella alone but is also on other forms of bacterial contamination. GAO's recommendation will strengthen our effort in soliciting understanding and cooperation from industry. Attachments I and II outline the actions taken and planned. See GAO note.

#### 2. Recommendation

"Cooperate in a program to assess the extensiveness of salmonella contaminated raw meat and poultry products (by product type) in the market."

#### Comment

APHIS would welcome the opportunity to cooperate with FDA in any assessment program focusing on bacterial contamination. The difficulty is the extent to which the measurement would accurately reflect the situation. Salmonella, as well as other bacteria, can be found in the marketplace and in myriad other places in the total environment. Given the number of variables, the ability to measure a small change in the prevalence of salmonella, or any bacteria for that matter, is extremely complex. Beyond that, to trace the change to a particular set of actions is even more difficult. We do have a statistical model which allows us to measure the impact of individual pieces of equipment used in the processing of cooked products on bacterial load. The development of this model was difficult, yet it is only a small part of the design effort which would be required to measure all of the variables.

Mr. Henry Eschwege

3. Recommendation

"Emphasize to consumers the serious potential health problem associated with the handling of raw meat and poultry, with particular emphasis on chicken and pork, and the precautions which should be taken in handling these products."

Comment

Rather than focusing on specific meat and poultry products, we believe there is a general need for all elements of the food production/processing/marketing chain to focus upon eliminating all possible sources of bacterial contamination--including but not limited to salmonella. There is an equally important need for consumers and institutional food handlers to be aware of and take the necessary precautions to protect themselves and those they serve against bacterially contaminated food without discriminating against any one or two types of products. Primary emphasis should be placed upon food safety precautions in all forms and to all segments of the public. Attachment II covers current USDA consumer education activity in this area.

See GAO note.

4. Recommendation

"Periodically measure the effectiveness of their consumer education programs. As a useful supplement to a broader educational effort, consideration should be given to identifying target groups, such as the elderly, to which intensified consumer education should be directed."

Comment

We agree with the report on the wisdom of, and necessity for evaluating consumer education programs. We believe this should be a continuing function rather than merely a periodic survey of relatively few housewives. In other words, all aspects of the program must be continually evaluated--such as the distribution of publications, the usage of printed and broadcast materials by the respective media, whether materials are effectively being received by intended audiences, etc.

The Statistical Reporting Service of USDA is currently pretesting an extensive questionnaire which deals in depth with the subject of food safety. Work on this survey was initiated within the past year, and we are hopeful that its final results will augment our base of knowledge for future consumer education program planning.

APPENDIX V

Mr. Henry Eschwege

Likewise, we are continuously evaluating the responses being received from broadcast stations, and the usage of printed materials by newspapers and magazines for patterns to improve the content and distribution of forthcoming media packets.

We are convinced, from discussion with many educators, government officials at all levels, professional home economists, and consumer representatives that educational materials for the general public are in greater need than those for certain limited groups.

Sincerely,



F. J. Mulhern  
Administrator

2 Enclosures

GAO Note: The attachments provided by Agriculture have been considered in the preparation of our final report but copies of the attachments have not been included.

PRINCIPAL OFFICIALS OF THE  
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
RESPONSIBLE FOR ADMINISTERING ACTIVITIES  
DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
SECRETARY OF HEALTH, EDUCATION, AND WELFARE:		
Caspar W. Weinberger	Feb. 1973	Present
Frank C. Carlucci (acting)	Jan. 1973	Feb. 1973
Elliot L. Richardson	June 1970	Jan. 1973
Robert H. Finch	Jan. 1969	June 1970
Wilbur J. Cohen	Mar. 1968	Jan. 1969
John W. Gardner	Aug. 1965	Mar. 1968
ASSISTANT SECRETARY FOR HEALTH (note a):		
Charles C. Edwards	Mar. 1973	Present
Richard L. Seggel (acting)	Dec. 1972	Mar. 1973
Merlin K. Duval, Jr.	July 1971	Dec. 1972
Roger O. Egeberg	July 1969	July 1971
Philip R. Lee	Nov. 1965	Feb. 1969
COMMISSIONER, FOOD AND DRUG ADMINISTRATION:		
Alexander M. Schmidt	July 1973	Present
Sherwin Gardner (acting)	Mar. 1973	July 1973
Charles C. Edwards	Feb. 1970	Mar. 1973
Herbert L. Ley, Jr.	July 1968	Dec. 1969
James L. Goddard	Jan. 1966	June 1968

<sup>a</sup>Until December 1972 the title of this position was Assistant Secretary (Health and Scientific Affairs).

APPENDIX VII

PRINCIPAL OFFICIALS OF  
THE DEPARTMENT OF AGRICULTURE  
RESPONSIBLE FOR ADMINISTERING ACTIVITIES  
DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
<b>SECRETARY OF AGRICULTURE:</b>		
Earl L. Butz	Dec. 1971	Present
Clifford M. Hardin	Jan. 1969	Nov. 1971
Orville L. Freeman	Jan. 1961	Jan. 1969
<b>ASSISTANT SECRETARY, MARKETING AND CONSUMER SERVICES:</b>		
Clayton Yeutter	Jan. 1973	Present
Richard E. Lyng	Mar. 1969	Jan. 1973
Vacant	Feb. 1969	Mar. 1969
Ted J. Davis	Sept. 1968	Jan. 1969
Vacant	June 1968	Sept. 1968
George L. Mehren	Sept. 1963	May 1968
<b>ADMINISTRATOR, ANIMAL AND PLANT HEALTH INSPECTION SERVICE:</b>		
Francis J. Mulhern	May 1972	Present
Francis J. Mulhern (acting)	Apr. 1972	May 1972
<b>ADMINISTRATOR, CONSUMER AND MARKETING SERVICE: (note a)</b>		
George R. Grange (acting)	Jan. 1972	Mar. 1972
Clayton Yeutter	Oct. 1970	Jan. 1972
George R. Grange (acting)	July 1970	Oct. 1970
Roy W. Lennartson	Feb. 1969	July 1970
Roy W. Lennartson (acting)	Jan. 1969	Feb. 1969
Rodney E. Leonard	Dec. 1967	Jan. 1969

<sup>a</sup>See footnote 1, p. 2.

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