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REPORT NO. 77
October 7, 1968

NATIONAL
COMMUNICABLE DISEASE CENTER

# SALMONELLA

## SURVEILLANCE

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FOR THE MONTH OF AUGUST 1968

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE/PUBLIC HEALTH SERVICE
Health Services and Mental Health Administration

# PREFACE

Summarized in this report is information received from State and City Health Departments, university and hospital laboratories, the National Animal Disease Laboratory (USDA, ARS), Ames, Iowa, and other pertinent sources, domestic and foreign. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Surveillance Report are most welcome. Please address

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## I. SUMMARY

This issue of the Salmonella Surveillance Report includes reports of three outbreaks of salmonellosis caused by contaminated homemade ice cream.

In August 1968, 1939 isolations of salmonellae were reported from humans, an average of 485 isolations per week (Table I, II, and V-A). This number represents an increase of 44 (1.0 percent) over the weekly average of July 1968 and a decrease of 28 (5.5 percent) from the weekly average of August 1967.

Reports of 697 nonhuman isolations of salmonellae were received during August 1968 (Tables III, IV, and V-B).

## II. REPORTS OF ISOLATIONS

The ten most frequently reported serotypes during August:

| HUMAN | | | | NONHUMAN | | |
|---|---|---|---|---|---|---|
| | Serotype | Number | Percent | Rank Last Month | Serotype | Number | Percent |
| 1 | typhi-murium* | 505 | 26.0 | 1 | typhi-murium* | 158 | 22.7 |
| 2 | enteritidis | 162 | 8.4 | 2 | heidelberg | 64 | 9.2 |
| 3 | heidelberg | 140 | 7.2 | 3 | montevideo | 34 | 4.9 |
| 4 | saint-paul | 124 | 6.4 | 5 | senftenberg | 29 | 4.2 |
| 5 | newport | 116 | 6.0 | 4 | infantis | 27 | 3.9 |
| 6 | infantis | 96 | 5.0 | 6 | anatum | 26 | 3.7 |
| 7 | thompson | 91 | 4.7 | 8 | derby | 24 | 3.4 |
| 8 | typhi | 61 | 3.1 | 9 | blockley | 22 | 3.2 |
| 9 | javiana | 44 | 2.3 | 7 | eimsbuettel | 20 | 2.9 |
| 10 | derby | 43 | 2.2 | >10 | saint-paul | 20 | 2.9 |
| | | | | | tennessee | 20 | 2.9 |
| | Total | 1382 | 71.3 | | Total | 444 | 63.7 |
| | TOTAL (all serotypes) | 1939 | | | TOTAL (all serotypes) | 697 | |
| | *Includes var. copenhagen | 28 | 1.4 | | *Includes var. copenhagen | 35 | 5.0 |

## III. CURRENT INVESTIGATIONS

NONE

## IV. REPORTS FROM THE STATES

### A. Kansas, North Carolina and Ohio

Three Outbreaks of Salmonellosis Caused by Contaminated Homemade Ice Cream

1. Reported by M. Leon Bauman, M.D., Director, Department of Community Health, and Rosemary B. Harvey, M.D., Director, Division of Preventive Medicine, Wichita-Sedgwick County Department of Public Health.

On June 8, 1968, ten persons from three families gathered for a cookout in Wichita, Kansas. Within the next 30 hours all ten became ill, with diarrhea (100 percent), vomiting (80 percent), fever (80 percent) and prostration (40 percent) as the major symptoms. Nine of the ten persons required medical attention, and all recovered uneventfully. Rectal swabs or stool cultures from everyone were positive for Salmonella thompson.

Food histories implicated homemade ice cream as the vehicle of infection, but none remained to be cultured. The ice cream had been prepared from raw milk and fresh eggs from the farm on which the cookout was held. One dozen eggs were collected from the flock six days after the outbreak. The eggs, gathered from the nests, were grossly contaminated with fecal matter; one egg was found to be cracked. S. thompson was grown from a slurry of nine of the eggs. Three of the eggs were cultured individually and S. thompson was isolated from one of these. In addition, environmental swabs from the chicken house were also positive for S. thompson. Chicken feed used for the flock was negative for salmonellae. A sample of milk was obtained from the home refrigerator, and it was positive for S. thompson. Additional samples of milk were subsequently obtained by a sanitarian using aseptic techniques. Salmonella was not isolated from any of these samples.

The family that owned the chickens had eaten eggs from this flock and had furnished eggs to the other two families involved in the outbreak over a long period of time. All persons denied any previous episodes of diarrheal illness and there was no history of illness in the chicken flock.

In summary, an outbreak of salmonellosis due to S. thompson occurred involving 10 persons following consumption of homemade ice cream. S. thompson was isolated from all persons involved in the outbreak and was isolated from whole eggs used to make the ice cream. S. thompson was also isolated from a sample of raw milk from the farm. This isolation presumably represents contamination of the milk during or after the milking process. Since samples obtained by aseptic technique from the dairy cow were negative, presumably the milk was contaminated while the family was shedding salmonellae as a result of the outbreak.

2. Reported by John I. Freeman, D.V.M., Chief, Veterinary Public Health Section, North Carolina State Board of Health, Jerry W. Davis, D.V.M., Chief, Veterinary Services, and Jon O. Hansen, D.V.M., Veterinary Officer, Seymour-Johnson Air Force Base.

On June 29, 1968, several families at the Seymour-Johnson Air Force Base in North Carolina held a party in order to make and eat ice cream. Within 36 hours after the party, 17 of the 19 persons who had eaten the ice cream were ill, with symptoms including diarrhea, stomach cramps, fever and vomiting. Illnesses were generally mild and none required hospitalization. Stool cultures were obtained from 15 of those ill, and 13 were positive for Salmonella typhi-murium.

The only two foods served at the party were commercially baked vanilla wafers and ice cream. The suspect ice cream had been prepared in two batches. The first batch was made from whole, uncracked eggs purchased at a local farm, canned condensed milk, sugar, pasteurized milk, and artificial favoring. The ingredients were blended in a mixing bowl with an electric mixer. The second batch was made with the same ingredients except that grade A eggs purchased at the base commissary were used in place of the farm eggs, and frozen strawberries were used as a flavoring agent. Ingredients were blended in the same bowl with the same electric mixer as that used for the vanilla ice cream. The strawberry ice cream was made immediately after the vanilla ice cream and the utensils were not cleaned between the two. The two batches were frozen in separate freezers immediately after blending and were consumed immediately after freezing. A single ice cream dipper was used to serve both flavors. The vanilla ice cream was served with a homemade peach topping, prepared from fresh peaches and granulated sugar.

Samples of the vanilla ice cream, strawberry ice cream and peach topping were obtained for culture. In addition, egg shells from the farm eggs used in preparing the vanilla ice cream were recovered from a trash can. Each of these samples was positive for S. typhi-murium.

To confirm the conclusion that the farm eggs were responsible for this outbreak, an investigation of the flock was made. On July 8, cloacal swabs were collected from 6 of the 9 hens in the flock and 12 swabs were taken from fresh droppings in the chicken house. In addition, one dozen fresh eggs and 2 samples of chicken feed were obtained. All samples were negative for salmonellae. On July 24, cultures from each of the 9 hens were repeated and were again negative. On July 28, the hens were sacrificed and swabs from intestine, gallbladder, ovary and oviduct were obtained. S. typhi-murium and S. thompson were isolated from cecal contents and S. enteritidis was isolated from an ovary and gallbladder. The cecal isolates of S. typhi-murium, isolates from both batches of ice cream and isolates from 4 cases were phage typed by the Enteric Bacteriology Unit, Laboratory Program, NCDC; all were of the same phage type, a variant of type 1-A.

An interesting aspect of this outbreak was the large inoculum of salmonellae which must have been present in the contaminated eggs. The ice cream was prepared quickly and consumed immediately, providing little opportunity for incubation and growth of the initial inoculum. Determinations by the Epidemiological Services Laboratory Section, Epidemiology Program, NCDC, indicated a level of contamination of >70,000 salmonellae per gram of vanilla ice cream. If an average serving of ice cream was only 3 oz. (100 gm), the number of organisms ingested would have exceeded $7 \times 10^6$. The contamination of the vanilla ice cream was sufficient to contaminate the strawberry ice cream by contact with common utensils.

3. Reported by Joseph Marguis, Sanitarian, Miami County Health Department, Jack H. Russell, D.V.M., M.P.H., Ohio Department of Health, and Taylor Kramer, Ohio Department of Health.

In August 1968, an outbreak of salmonellosis occurred involving 13 of 14 persons who attended a social gathering in a home near Troy, Ohio. Incubation periods in 12 of the cases varied from 8 to 20 hours after the meal was consumed at the gathering. The thirteenth case occurred in a 4-year-old, 30 hours after the onset of illness in her parents and siblings. Symptoms included fever, diarrhea, nausea, and abdominal cramping in all cases; seven persons reported severe vomiting. One patient required hospitalization. Stool cultures performed several weeks after illness were positive for S. enteritidis in two cases.

Food histories suggested that ice cream served at the party was the vehicle of infection. All of the 12 persons who consumed the ice cream became ill. Of 2 persons not consuming ice cream, one was the aforementioned 4-year-old who probably represents a secondary case and the other was not ill at any time. Culture of a sample of the ice cream by the Ohio Department of Health Laboratory was positive for S. enteritidis.

The ice cream had been prepared by the host from raw eggs, sugar, canned milk, non-fat dried milk, and vanilla. At no time was any heat applied to the mixture. After preparation, the mixture was allowed to sit at room temperature for several hours prior to freezing.

The eggs used in the ice cream were cracked eggs purchased from a local poultry farm. The poultry farm was visited and cultures were performed on intact and checked shell eggs (surface swabbing), "leaker" shell eggs, chicken droppings, and chicken feed. S. enteritidis was isolated from a slurry of the "leaker" eggs.

EDITOR'S COMMENT: Commercially manufactured ice cream represents virtually no hazard as a vehicle for salmonellosis. This product is prepared under the same strict supervision required for all dairy products and undergoes final pasteurization prior to freezing. In addition, commercial ice cream, other than "French vanilla," contains no eggs or egg products. However, as the three similar outbreaks described above illustrate, homemade ice cream is not always given the same treatment. Thus, if a contaminated raw ingredient such as contaminated shell eggs are added to the mixture, the final product will also be contaminated.

Each of these outbreaks was caused by contaminated shell eggs. In two incidences the eggs used were apparently cracked. As has been shown many times in the past, cracked eggs provide a much more favorable medium for the transmission of salmonellosis than do whole eggs, and their complete elimination from consumer channels would provide a means to reduce the incidence of salmonellosis in the United States. The third outbreak, however, was not caused by cracked eggs but rather by intact ungraded eggs, presumably contaminated on their external surfaces.

That uncracked eggs can be a vehicle for salmonellosis suggests the importance of requirements for adequate disinfection of external surfaces of all eggs prior to their distribution and sale. Although disinfection is generally performed prior to the sale of grade A eggs, this is not necessarily true for "farm" eggs. Such universal requirements are another means by which the incidence of salmonellosis can be reduced in the United States.

B. New Jersey

An Outbreak of Salmonellosis in an Industrial Cafeteria

Reported by Ronald Altman, M.D., Acting Director, and Howard Rosenfeld, D.V.M., Senior Public Health Veterinarian, Division of Preventable Diseases, and Halina Ragazzoni, D.V.M., Public Health Veterinarian, Central State Health District, New Jersey State Department of Health, and Charles Janeway, M.D., EIS Officer located at the New Jersey State Department of Health.

On May 7, 1968, an outbreak of salmonellosis occurred at an industrial plant in New Jersey involving 200 employees and 45 visitors to the plant from New York State. The suspect meal was a luncheon served on May 7 in the plant cafeteria. Of 112 persons interviewed following the outbreak, including 72 of the employees and 40 of the visitors, 47 (42 percent) reported a gastrointestinal illness. Symptoms included diarrhea (96 percent), fever (85 percent), abdominal cramps (81 percent), chills (79 percent), nausea (62 percent), and vomiting (40 percent). Onset of illness occurred

from 4 to 46 hours following the suspect meal, with a mean onset of 21 hours. Median duration of symptoms was 50 to 59 hours. Recovery was uneventful in all cases and no one was hospitalized. Of 36 stool cultures from persons who had been ill, 19 were positive for S. typhi-murium and 3 for S. typhi-murium and S. typhi-murium var. copenhagen. In addition, of 9 asymptomatic kitchen employees who were also cultured, 2 were positive for both S. typhi-murium and S. typhi-murium var. copenhagen.

Food histories obtained at the time of interview implicated two separate food items, veal Parmesan and baked macaroni, as vehicles of infection. The veal Parmesan was made from frozen veal patties prepared on the morning of the outbreak. The patties were dipped into a freshly prepared batter of bread crumbs, grade-A eggs, milk, and flour. After one side was fried, the patty was turned and a slice of mozzarella cheese was added. Tomato sauce prepared the previous day was added, and the food was kept warm on a hot line until served. The baked macaroni was prepared on Wednesday, May 1, and fresh cottage cheese was added on Friday. The dish was then served at the Friday meal. No illness followed the Friday meal. Approximately 40 leftover servings were refrigerated until Tuesday, May 7, when the remainder was served. The walk-in refrigerator in which the leftover macaroni was stored had been turned off on Sunday, May 5, as part of the regular electrical maintenance program at the plant. No samples of either the veal Parmesan or the baked macaroni were available for culture.

A sanitary inspection of the kitchen facilities demonstrated several faults. Cutting boards and wooden stirrers were cracked, and cracks were filled with grease and dried food. These cutting boards were used to hold meat while being defrosted. In addition, pots and pans were not being sanitized, perishable foods were not stored at proper temperatures, and the dry storage room was being used as a dressing room by the employees. When these defects were called to the attention of the plant management, they were quickly corrected.

EDITOR'S COMMENT: A common-source outbreak of salmonellosis due to S. typhi-murium and S. typhi-murium var. copenhagen occurred at an industrial plant cafeteria on May 7, 1968. Although food histories incriminated veal Parmesan and baked macaroni as vehicles, no food was available for culture, and thus this conclusion could not be confirmed bacteriologically. Since both foods were apparently adequately cooked prior to serving, it is not possible to explain the manner in which they then became contaminated. However, three hypotheses can be proposed: 1) Sanitary conditions in the kitchen were not adequate and the food could have been contaminated from the environment after cooking. 2) The food could have been contaminated by a food handler. Two food handlers were identified as excreting the two serotypes involved in the outbreak. Although one of these two may have been the source of the infection, it is more likely that instead they were both infected as a result of the outbreak. 3) The foods may have been contaminated prior to cooking and were not adequately cooked. Macaroni, manufactured from egg products, is occasionally contaminated with salmonellae, although it has never previously been implicated as a vehicle for infection. In addition, macaroni, to be edible, must be cooked in boiling water for 10 to 15 minutes, a time sufficient to eliminate salmonellae that might be present. Red meats, including veal, are also occasionally contaminated with salmonellae. In summary, although veal Parmesan and baked macaroni were implicated as food vehicles in an outbreak of salmonellosis, no conclusion could be made concerning the manner in which these two items became contaminated.

C. Salmonella enteritidis - Philadelphia, Pennsylvania

Reported by Lewis D. Polk, M.D., Deputy Commissioner for Community Health Services; Sylvan Fish, M.D., Chief of Communicable Disease Control; Alfred Bogucki, M.D., Chief of Epidemiology, Department of Public Health, City of Philadelphia; and Norman T. Ditchek, M.D., EIS Officer located at the Philadelphia City Health Department.

A recent marked increase in isolations of S. enteritidis from persons in the city of Philadelphia has occurred. For the first half of 1968, 31.4 percent of the 185 isolations of salmonellae reported from Philadelphia were this serotype, compared with only 12.8 percent of the 188 isolates reported in the first half of 1967. In fact, S. enteritidis was the most frequently isolated serotype in three of the first six months of 1968 and was also the most frequently isolated serotype for the entire six-month period. Because there seemed to be no obvious explanation for this increase, an epidemiologic investigation was undertaken.

Of the 58 reported cases of S. enteritidis from January to June, 1968, 34 were females and 24 were males. Most cases were in the younger age groups, with 54 percent 10 years old or younger. Cases clustered in the lower socioeconomic areas of the city, a geographic distribution similar to that for cases due to other salmonella serotypes. Most persons involved were Negro. Of the 58 persons involved, 40 were ill as a result of their salmonella infection. Predominant symptoms included diarrhea (90 percent), fever (80 percent), and cramps (67 percent); diarrhea was reported as bloody in 9 cases (22 percent). One fatality occurred, that of a 68-year-old female with a long history of alcoholism.

Each patient was interviewed in an attempt to define a common vehicle. No single food item, restaurant, or market could be identified as a common source. A single family cluster of 7 cases was attributed to consumption of homemade sandwiches prepared by a person ill with diarrhea at the time of preparation. A second family cluster of three cases was attributed to contact with a pet turtle. However, in no other cases could a specific vehicle be identified. The problem still persists and investigations are continuing.

EDITOR'S COMMENT: This marked rise in isolations of S. enteritidis in Philadelphia is mirrored by a similar though smaller rise in isolations of S. enteritidis throughout the United States. From January to June 1967 this serotype accounted for 5.6 percent of all salmonella isolations; in 1968 S. enteritidis accounted for 7.6 percent of isolations during the same period. A cluster of 20 cases reported in July from Massachusetts were investigated by the Massachusetts State Department of Health; however, as in the investigation reported above, no common vehicle could be identified.

The difficulty of linking apparently sporadic cases of salmonellosis cannot be underestimated. A list of possible vehicles of infections is virtually limitless. Salmonellae have been isolated from many different kinds of foods, candies, medicines, pets, and even cleaning products. Only with continued and repeated investigations similar to the one reported can we hope to add to our knowledge of human salmonellosis and improve measures for control.

D. New York

An Outbreak of Salmonellosis in a Nursing Home

Reported by Tibor Fodor, M.D., Chief, Division of Epidemiology and Diagnosis, and Carol S. Schachner, M.D., Epidemiologist, City of New York Health Department.

Between August 17 and 27, 1967, eight residents of a nursing home in New York City developed gastroenteritis. Symptoms included diarrhea, cramps, fever, vomiting, and weakness. Average duration of illness was approximately 5 days. One patient was hospitalized as a result of the infection; no deaths occurred. Stool cultures taken 1 to 2 weeks after onset of illness were positive for Salmonella infantis in three of those ill.

The epidemic pattern was that of a cross-infection outbreak with cases occurring sporadically over a 10-day period. However, no opportunity for intimate contact among the patients involved could be documented. Although the nursing home had single- and multiple-bed rooms for its 200 residents, no more than 1 case occurred in a given room. There were three separate dining rooms supplied by a single kitchen and all those involved ate in the same dining room; however, they all ate at separate tables. The outbreak was self-limiting, and no specific control measures were applied.

## V. SPECIAL REPORTS

### A. Recent Articles on Salmonellosis

The following articles on salmonellosis of interest to public health workers have been published in recent months.


1. Anderson, E. S.: Drug resistance in Salmonella typhi-murium and its implications. Brit. Med. J. 5614:333, 1968.

2. Belliveau, R. R., Grayson, J. W., and Butler, T. J.: A rapid simple method of identifying enterobacteriaceae. Am. J. Clin. Path. 50:126, 1968.

3. Cohen, S. N.: Diagnosis and treatment of salmonella infections. Medical Staff Conference Discussion. California Medicine 108:369, 1968.

4. Diaz, F. and Neter, E.: Antibody response to the common enterobacterial antigen of children with shigellosis, salmonellosis and urinary tract infections. Amer. J. Med. Sci. 256:18, 1968.

5. Fish, N. A., Fletch, A. L., and Butler, W. E.: Family outbreak of salmonellosis due to contact with guinea pigs. Can. Med. Ass. J. 99:418, 1968.

6. Pivnick, H., Eidman, I. E., Manzatiuk, S., and Pommier, E.: Growth of food poisoning bacteria on barbecued chicken. J. Milk Food Technol. 31:198, 1968.

7. Smith, H. W.: Antimicrobial drugs in animal feeds. Vet. Rec. 83:143, 1968.

B. U.S. Food and Drug Administration Recall of Products Contaminated with Salmonellae, August 5 to September 2, 1968.

From August 5 to September 2, 1968, three products were recalled by the U.S. Food and Drug Administration because of salmonella contamination. These products are summarized in the table below.

U.S. Food and Drug Administration Weekly Recall List
Summary of Products Contaminated with Salmonellae
Week Ending August 5 through Week Ending September 2, 1968

| Week Ending | Name, Label, Form | Manufacturer, Distributor | Lot No. | Use | Depth of Recall | Product Distribution | Serotype |
|---|---|---|---|---|---|---|---|
| 8/5 | Whey labeled net weight 100 lbs Krafen spray dried sweet whey (edible) extra grades (Kraft Foods, Chicago, Ill.) | (Mfr): Kraft Foods, Lawrenceberg, Kentucky | DEC 1967 L | Food | User | Missouri, Kentucky, Illinois, Texas | S. cubana |
| 8/30 | Prize of Iowa Non-Fat Dry Milk, Lo-temp spray process in 50 lb bags | Des Moines Cooperative Dairy, Des Moines, Ia. | BK 59 | Food | Wholesale | Florida | S. worthington<br>S. binza |
| 9/2 | Sausage and Cheese Pizza "Lakeshire Sandwiches .. sausage and cheese pizza" | Packed and distributed Lakeshire Sandwiches (St. Louis and Kansas City, Mo.) MFR: Land of Lincoln Meat Products Inc., Paxton, Ill. | None | Food | Retail | Fort Worth, Texas | Salmonella serotype not determined |

C. Announcement of a Course on Methods for the Isolation of Salmonellae from Food Products and Animal Feeds

The Epidemiology Program and the Laboratory Program of the National Communicable Disease Center will conduct a course on methods for isolating salmonellae from food products and animal feeds. The course will be conducted January 6-17, 1969 (Registration ends November 11, 1968) and June 16-27, 1969 (Registration ends April 21, 1969). Prerequisite for the course is 6 months' experience in either a bacteriology or quality control laboratory. The course is divided equally between lectures and laboratory exercises. Lectures include epidemiology, sampling, and principles of isolation, and identification. Laboratory exercises include all necessary steps in the isolation and the preliminary biochemical and serologic identification of salmonellae from various foods and feeds, such as eggs, dry milk, candy, red meats, poultry, animal by-products, and fish meal.

State, Federal, and industry personnel may obtain application forms from the Training Office, Laboratory Consultation and Development Section, Laboratory Program, National Communicable Disease Center, Atlanta, Georgia 30333.

## VI. INTERNATIONAL

Salmonellosis in Western Australia - 1967

Reported by E. M. Mackay-Scollay, Medical Microbiologist-in-Charge, Department of Public Health-Laboratory Services, Western Australia.

In 1967, a total of 1419 isolates of salmonellae from all sources was reported from Western Australia; including 713 isolates from humans and 706 from nonhuman sources. The 5 most common serotypes, representing 60.5 percent of the total isolations, are listed below:

| Serotype | Number | Percent |
|---|---|---|
| S. typhi-murium | 457 | 32.2 |
| S. muenchen | 130 | 9.2 |
| S. chester | 126 | 8.9 |
| S. adelaide | 97 | 6.8 |
| S. derby | 49 | 3.4 |

## VII. FOOD AND FEED SURVEILLANCE

NONE

## TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, AUGUST, 1968

| SEROTYPE | GEOGRAPHIC DIVISION AND REPORTING CENTER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NEW ENGLAND | | | | | | MIDDLE ATLANTIC | | | | | EAST NORTH CENTRAL | | | | | WEST NORTH CENTRAL | | | | | | | SOUTH ATLANTIC | | | | | | | |
| | ME | NH | VT | MAS | RI | CON | NYA | NYB | NYC | NJ | PA | OHI | IND | ILL | MIC | WIS | MIN | IOW | MO | ND | SD | NEB | KAN | DEL | MD | DC | VA | WVA | NC | SC | GA | FLA |
| *anatum* | | | | | | | 1 | | | | 1 | | | 4 | | 1 | | | 2 | | | | | | 2 | | 1 | | | | 1 |
| *bareilly* | | | | | | | | 1 | | | 1 | | | | | | 1 | | | | | | | | | | | | | | |
| *blockley* | | | 1 | 5 | | 1 | | | 1 | | 1 | 1 | | 3 | 3 | 1 | | | | | | | 1 | | | | | | | 4 | 1 |
| *braenderup* | | | | 7 | | | | | | | | | 1 | 1 | | | | | | | | | | | | | | | | | |
| *bredeney* | | | | 1 | | | | | 2 | 1 | | | | 2 | 1 | 1 | 4 | | | | | | | | 2 | | | | | | |
| *chester* | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | |
| *cholerae-suis v kun* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *cubana* | | | | 1 | | | | 2 | | | | | | | | | | | | | | | | | 1 | | | | | | |
| *derby* | | | | 5 | | | 2 | 2 | 2 | | | | | 7 | 1 | | | | | | | | | | 4 | | 1 | | 1 | | 2 | 4 |
| *enteritidis* | 1 | 1 | 1 | 26 | | 2 | 2 | 9 | 10 | 5 | 12 | 7 | 1 | 18 | 4 | 2 | 6 | | 1 | | | | 1 | | 19 | | 2 | | 4 | | 10 | 2 |
| *give* | | | | | | | | | | | | | | 1 | | | 2 | | | | | | | | | | | | | | |
| *heidelberg* | 2 | | | 6 | 2 | 1 | | 6 | 5 | 5 | 11 | 6 | 2 | 24 | 4 | 1 | 5 | | 2 | | | | | | 6 | 3 | | | 4 | | 4 | 5 |
| *indiana* | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | 5 | |
| *infantis* | | | | 7 | | 1 | | 4 | 6 | 2 | 9 | | 6 | 8 | 4 | 5 | | | | | | | 11 | | 2 | | 7 | | 2 | | 1 | 2 |
| *java* | | | | | | 1 | | | | | 1 | | | | | | 1 | | | | | | | | 1 | | | | | | | 3 |
| *javiana* | | | | | | 1 | | | | 1 | | | 1 | 1 | | 2 | | | 1 | | | | 2 | | | | | | | | 1 | 12 |
| *litchfield* | | | | | | | | | | | | | | | | | 1 | | | | | | | | 2 | | | | 1 | | | 3 |
| *livingstone* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *manhattan* | | | | | | | 1 | 1 | 1 | | | | | 1 | | | | | | | 1 | | | | 1 | | 1 | | | | | 1 |
| *miami* | | | | | | | | | | | 1 | | | | | | | | | | | | | | 3 | | | | | | 1 | 8 |
| *mississippi* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| *montevideo* | | | | 2 | | | 1 | | 1 | | 1 | 1 | | | | | 1 | | | | | | | | | 3 | | | | | 2 | 3 |
| *muenchen* | | | | | | | | | 1 | | | | | | 2 | | 3 | | 2 | | | | 1 | | 1 | | 1 | | 1 | | | 11 |
| *newington* | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| *newport* | | | | 1 | | | | 5 | 3 | | 1 | 1 | | 7 | 2 | 1 | 2 | 1 | | | | | 7 | | 3 | | 2 | | 1 | | 5 | 39 |
| *oranienburg* | | | | 1 | | | | 4 | 2 | 3 | 2 | 1 | | | | | | | | | | | | | | | 1 | | | | | 5 |
| *panama* | | | | | | | | | 2 | | 2 | | | 1 | 3 | | | | | | | | | | | | | | | | | |
| *paratyphi B* | | | | 2 | | | | 1 | | | | | | | 1 | | | | | | | | | | 2 | | | | | | | 2 |
| *reading* | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *saint-paul* | | | | 4 | | 1 | | 3 | 6 | 3 | 22 | 12 | 2 | 11 | 7 | 2 | 1 | | 1 | | | | | 1 | 6 | | 5 | | 2 | | | 9 |
| *san-diego* | | | | | | | | | 4 | 7 | | | | 1 | | | | | | | | | | | | | | | 1 | | | |
| *schwarzengrund* | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | 1 | | | | | |
| *senftenberg* | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| *tennessee* | | | | 1 | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| *thompson* | | | | 3 | | | | 4 | 3 | 2 | 3 | 7 | | 9 | 4 | 1 | 1 | | 1 | | | | | 1 | 8 | | 4 | | 4 | | 10 | 1 |
| *typhi* | 2 | 1 | | | | 1 | 5 | | 1 | | | 5 | | | | | | | 1 | | | | 1 | | 2 | | | | 2 | 1 | 3 | 2 |
| *typhimurium* | 2 | | 4 | 28 | | 8 | | 23 | 16 | 15 | 24 | 10 | 12 | 35 | 14 | 11 | 6 | | 9 | | | 1 | 10 | | 35 | 3 | 16 | 4 | 21 | | 15 | 26 |
| *typhimurium v cop* | | | | 14 | | 1 | | | | 3 | | | | | 3 | | | | | | | | | | | | | | | | | |
| *weltevreden* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *worthington* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL | 8 | 2 | 6 | 114 | 2 | 18 | 12 | 67 | 66 | 49 | 93 | 51 | 25 | 134 | 54 | 28 | 34 | 1 | 21 | – | 1 | 1 | 34 | 2 | 101 | 9 | 43 | 4 | 46 | 1 | 65 | 140 |
| ALL OTHER* | – | 8 | – | 3 | 5 | – | 39 | 2 | 2 | 1 | 6 | 1 | 1 | 1 | 1 | 4 | – | 2 | 2 | 2 | – | 7 | – | – | 1 | 23 | 6 | – | – | 1 | 4 | 5 |
| TOTAL | 8 | 10 | 6 | 117 | 7 | 18 | 51 | 69 | 68 | 50 | 99 | 52 | 26 | 135 | 55 | 32 | 34 | 3 | 23 | 2 | 1 | 8 | 34 | 2 | 102 | 32 | 49 | 4 | 46 | 2 | 69 | 145 |

Note: NYA – New York, Albany; NYB – Beth Israel Hospital; NYC – New York City. Beth Israel Hospital laboratory is a reference laboratory and this month serotyped a total of 129 cultures.

* See Table II.

## TABLE I – Continued

| GEOGRAPHIC DIVISION AND REPORTING CENTER | | | | | | | | | | | | | | | | | | | | | TOTAL | % OF TOTAL | CUMULATIVE TOTAL | % OF CUMULATIVE TOTAL | SEROTYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EAST S. CENTRAL | | | | WEST S. CENTRAL | | | | MOUNTAIN | | | | | | | | PACIFIC | | | | | | | | | |
| KY | TEN | ALA | MIS | ARK | LA | OKL | TEX | MON | IDA | WYO | COL | NM | ARI | UTA | NEV | WAS | ORE | CAL | ALK | HAW | | | | | |
| 1 | | 4 | | | 2 | | | | | | | | 1 | | | | | 3 | | 3 | 27 | 1.4 | 151 | 1.2 | *anatum* |
| | | | | | | | | | | | | | | | | 1 | | 1 | | | 5 | 0.3 | 36 | 0.3 | *bareilly* |
| 1 | | | | | 1 | 1 | 2 | | | | | | | | | | 1 | 13 | | | 41 | 2.1 | 314 | 2.6 | *blockley* |
| | | | | | | | | | | | | | | | | | | 1 | | | 10 | 0.5 | 100 | 0.8 | *braenderup* |
| | | 1 | | | | 1 | | | | | | | | | 4 | | | | | | 20 | 1.0 | 135 | 1.1 | *bredeney* |
| | | | | | | | | | | | | | | | | | | | | | 2 | 0.1 | 37 | 0.3 | *chester* |
| | | | | | | | | | | | | | | | | | | | | | — | | 20 | 0.2 | *cholerae-suis v kun* |
| | | | | | | | | | | | | | | | | | | 1 | | | 5 | 0.3 | 33 | 0.3 | *cubana* |
| 4 | | | | | | | 2 | | | | | | | 1 | | | | 8 | | 1 | 43 | 2.2 | 280 | 2.3 | *derby* |
| 2 | | 1 | 1 | | | 1 | 1 | | 1 | | | 1 | | 1 | | | 3 | 4 | | 2 | 162 | 8.4 | 1,005 | 8.2 | *enteritidis* |
| | | | | | 2 | | | | | | | | 1 | | | | | | | | 6 | 0.3 | 41 | 0.3 | *give* |
| 5 | | 4 | 1 | | 1 | 2 | | 3 | 1 | | | 2 | | | 3 | | 2 | 15 | | 2 | 140 | 7.2 | 877 | 7.1 | *heidelberg* |
| | | | | | | | | | | | | | | | | | | | | | 6 | 0.3 | 64 | 0.5 | *indiana* |
| 2 | | 4 | | | | 2 | | | | | | 1 | | | | | | 6 | | 6 | 96 | 5.0 | 585 | 4.8 | *infantis* |
| 3 | | | 1 | | | 1 | | | | | | | | | | | | 2 | 1 | | 12 | 0.6 | 119 | 1.0 | *java* |
| 12 | | | 1 | | 7 | 2 | 4 | 6 | | | | | | | | | | 3 | | | 44 | 2.3 | 265 | 2.2 | *javiana* |
| 3 | | | | | | | 1 | | | | | | | | | | | | | | 9 | 0.5 | 63 | 0.5 | *litchfield* |
| | | | | | | | | | | | 1 | | | | | | | | | | 1 | 0.1 | 23 | 0.2 | *livingstone* |
| 1 | | | | | | 1 | | 1 | | | | | | | | 1 | | | | | 11 | 0.6 | 119 | 1.0 | *manhattan* |
| 8 | | | | | | | | | | | | | | | | | | | | | 13 | 0.7 | 65 | 0.5 | *miami* |
| | | | | | | 2 | | 1 | | | | | | | | | | 2 | | | 7 | 0.4 | 35 | 0.3 | *mississippi* |
| 3 | | | | | | | 1 | 1 | | | 3 | | | | | | | 3 | | 1 | 24 | 1.2 | 157 | 1.3 | *montevideo* |
| 11 | 1 | | | | | 1 | 2 | | | | | | | | | | | 1 | | | 28 | 1.4 | 121 | 1.0 | *muenchen* |
| | | 1 | | | | 1 | | | | | | | | | | | | | | | 3 | 0.2 | 26 | 0.2 | *newington* |
| 39 | 1 | | | | 2 | 1 | 1 | 12 | | | 3 | 1 | | | | 1 | | 12 | | 1 | 116 | 6.0 | 687 | 5.6 | *newport* |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | 1 | | | 1 | 1 | | 2 | | | | | | | | | | 3 | | | 29 | 1.5 | 196 | 1.6 | *oranienburg* |
| | | | | | 2 | | | | | | 1 | | 1 | | | | | 3 | | 6 | 21 | 1.1 | 129 | 1.0 | *panama* |
| | | | | | | | 1 | | | | | | | | | | 1 | 1 | | | 11 | 0.6 | 73 | 0.6 | *paratyphi B* |
| | | | | | | 1 | 1 | | | | | | 1 | | | 1 | | | | | 5 | 0.3 | 25 | 0.2 | *reading* |
| 9 | 1 | | | | 3 | | | 2 | | 1 | | 2 | | | 3 | | 3 | | 1 | 1 | 124 | 6.4 | 728 | 5.9 | *saint-paul* |
| | | | | | | | | | | | 2 | | | | | 2 | | | | | 18 | 0.9 | 82 | 0.7 | *san-diego* |
| | | | | | | | | | | | | | | | | | | 1 | | 1 | 5 | 0.3 | 28 | 0.2 | *schwarzengrund* |
| | 1 | | | | | | | | | | | | | | 2 | | | 1 | | | 8 | 0.4 | 35 | 0.3 | *senftenberg* |
| | | 1 | | | | | | | | | | | | | | | | 1 | | | 4 | 0.2 | 59 | 0.5 | *tennessee* |
| 1 | 2 | 3 | | | | | 2 | | | | | 1 | | 1 | | 1 | 1 | 13 | | | 91 | 4.7 | 370 | 3.0 | *thompson* |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | 1 | 2 | | 3 | 3 | | 1 | | | | | | | 2 | 1 | 17 | 3 | | 61 | 3.1 | 384 | 3.1 | *typhi* |
| 26 | 8 | 6 | | 5 | 14 | 2 | 21 | | | | 12 | | 4 | 3 | | 4 | 1 | 45 | | 1 | 477 | 24.6 | 3,237 | 26.3 | *typhimurium* |
| | | | | 2 | 4 | | | | | | | | | | | | 1 | | | | 28 | 1.4 | 197 | 1.6 | *typhimurium v cop* |
| | | | | | | | | | | | | | | | | | | | | 4 | 4 | 0.2 | 55 | 0.4 | *weltevreden* |
| | | | | | | | | | | | | | | | | | | | | | — | | 12 | 0.1 | *worthington* |
| 40 | 8 | 23 | 21 | 1 | 25 | 38 | 18 | 60 | 2 | 2 | — | 28 | 2 | 9 | 11 | 6 | 21 | 6 | 170 | 5 | 29 | 1,717 | 88.6 | 10,968 | 89.2 | TOTAL |
| 5 | — | 1 | 5 | 3 | 6 | 2 | 1 | 24 | 1 | — | — | 4 | 20 | 4 | — | 4 | 2 | 9 | 7 | 2 | — | 222 | | 1,329 | | ALL OTHER* |
| 45 | **8** | **24** | **26** | **4** | **31** | **40** | **19** | **84** | **3** | **2** | **–** | **32** | **22** | **13** | **11** | **10** | **23** | **15** | **177** | **7** | **29** | **1,939** | | **12,297** | | **TOTAL** |

## TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES, AUGUST, 1968

| SEROTYPE | REPORTING CENTER | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALA | ALK | ARI | ARK | CAL | COL | DC | FLA | GA | ILL | IND | IOW | LA | MD | MAS | MIC | MIS | MO | MON | NEB | NEV | NH | NJ | NM |
| *alachua* | | | | | 1 | | | | | | | | | | | | | | | | 3 | | | |
| *albany* | | | | | | | | | | | | | | | | | | | | | | | | |
| *amersfoort* | | | | | | | | | | | | | | | | | | | | | | | | |
| *arechavaleta* | | | | | | | | | | | | | | | | | | | | | | | | |
| *atlanta* | | | | | | | | | 2 | | | | | | | | | | | | | | | |
| *berta* | 1 | | 3 | | 1 | | | | | | | | | | | | | | 1 | | | | | |
| *bradford* | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| *brandenburg* | | | | | | | | | | 1 | | | | | | | | | | | | | | |
| *california* | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| *concord* | | | | | | | | | | | | | | | | | | | | | | | | |
| *dublin* | | | | | 1 | | | | | | | | | | 1 | | | | | | | | | |
| *gaminara* | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| *grumpensis* | | | | | | | | | | | 1 | | | | | | | | | | | | | |
| *hartford* | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| *irumu* | | | | | | | | | | | | | | | | | | | | | | | | |
| *johannesburg* | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| *kaapstad* | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| *kottbus* | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| *meleagridis* | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| *minnesota* | | | | | | 1 | | | | | | | | | | | | 1 | | | | | | |
| *muenster* | | | | | | 1 | | 1 | | | | | | | | | | | | | | | 1 | |
| *norwich* | | | 1 | 4 | | | | | 1 | | | | | | | | | 1 | | | | | | |
| *onderstepoort* | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| *oritamerin* | | | | | | | | | | | | | | | | | | | | | | | | |
| *oslo* | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| *paratyphi-A* | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| *pensacola* | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| *pomona* | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| *poona* | | | | | 1 | | | 1 | | | | | 1 | | 1 | | | | | | | | | |
| *rubislaw* | | | | | | | | | | | | | | | | | | | | | | | | |
| *saphra* | | | | | | | | | | | | | | | | | | | | | | | | |
| *siegburg* | | | | | | | | | | | | | | | | | | | | | | | | |
| *simsbury* | | | | | | | | | | | | | | | | | | | | | | | | |
| *stanley* | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| *tallahassee* | | | | | | | | | | | | | | | | | | | | | | | | |
| *urbana* | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| TOTAL | 5 | — | 4 | 4 | 7 | 4 | — | 4 | 4 | 1 | 1 | — | 2 | 1 | 2 | 1 | — | 2 | 1 | — | 4 | — | 1 | — |
| NOT TYPED* | — | 2 | — | 2 | — | — | 23 | 1 | — | — | — | 2 | — | — | 1 | — | 3 | — | — | 7 | — | 8 | — | 20 |
| TOTAL | 5 | 2 | 4 | 6 | 7 | 4 | 23 | 5 | 4 | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 3 | 2 | 1 | 7 | 4 | 8 | 1 | 20 |

* See Table V-A

TABLE II – Continued

| REPORTING CENTER | | | | | | | | | | | | | | | TOTAL | CUMULATIVE TOTAL | SEROTYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NYA | NYB | NYC | ND | OHI | OKL | ORE | PA | RI | SC | TEN | TEX | VA | WAS | WIS | | | |
| | | | | | | | | | | | | | | | 4 | 13 | *alachua* |
| | | | | 1 | | | | | | | | 1 | | | 2 | 12 | *albany* |
| | | | | | | | | | | | | | 1 | | 1 | 1 | *amersfoort* |
| | | | | | 1 | | | | | | | | | | 1 | 1 | *arechavaleta* |
| | | | | | | | | | | | | | | | 2 | 8 | *atlanta* |
| | | | | | | | | | | | | 3 | | | 9 | 22 | *berta* |
| | | | | | | | | | | | | | | | 1 | 2 | *bradford* |
| | | | | | | | | | | | | | | | 1 | 3 | *brandenburg* |
| | | | | | | | | | | | | | | | 2 | 16 | *california* |
| | | | | | | | | | | | | 2 | | | 2 | 3 | *concord* |
| | | | | | | | | | | | | | | | 2 | 10 | *dublin* |
| | | | | | | | | | | | | | | | 1 | 8 | *gaminara* |
| | | | | | | | | | | | | | | | 1 | 2 | *grumpensis* |
| | | | | | | | | | | | | | | | 1 | 11 | *hartford* |
| | | | | | | | 1 | | | | | | | | 1 | 2 | *irumu* |
| | | | | | | | | | | | | | | | 1 | 6 | *johannesburg* |
| | | | | | | 1 | | | | | | | | | 2 | 2 | *kaapstad* |
| | | | | | | | | | | | | | | | 1 | 3 | *kottbus* |
| | | | | | | | | | | | | | | | 1 | 2 | *meleagridis* |
| | | | | | | | | | | | | | | | 2 | 9 | *minnesota* |
| | | | | | | | | | | | | | | | 3 | 22 | *muenster* |
| | | | | | | | | | | | | | | | 7 | 14 | *norwich* |
| | | | | | | | | | | | | | | | 1 | 1 | *onderstepoort* |
| | | | | | | | 1 | | | | | | | | 1 | 1 | *oritamerin* |
| | | | | | | | | | | | | | | | 1 | 9 | *oslo* |
| | | | | | | | 1 | | | | | | | | 2 | 11 | *paratyphi-A* |
| | | | | | | | 3 | | | | | | | | 4 | 7 | *pensacola* |
| | | | | | | | | | | | | | | | 1 | 3 | *pomona* |
| | | | | | | | | | | | | | | 1 | 5 | 48 | *poona* |
| | | | | | | | | | | | 2 | | | | 2 | 19 | *rubislaw* |
| | | | | | | | | | | | 3 | | | | 3 | 3 | *saphra* |
| | | | | | | | | | | 1 | | | | | 1 | 4 | *siegburg* |
| | 2 | | | | | | | | | | | | | | 2 | 3 | *simsbury* |
| | | | | | | | | | | | | | | | 1 | 5 | *stanley* |
| | | | | | | | | | | | | | 1 | | 1 | 3 | *tallahassee* |
| | | | | | | | | | | | | | | | 1 | 15 | *urbana* |
| – | 2 | – | – | 1 | 1 | 1 | 6 | – | – | 1 | 5 | 6 | 2 | 1 | 74 | 415 | TOTAL |
| 39 | – | 2 | 2 | – | – | 8 | – | 5 | 1 | – | 19 | – | – | 3 | 148 | 914 | NOT TYPED* |
| **39** | **2** | **2** | **2** | **1** | **1** | **9** | **6** | **5** | **1** | **1** | **24** | **6** | **2** | **4** | **222** | **1,329** | **TOTAL** |

Cumulative Totals include isolations of all serotypes (except those listed in Table I) reported this year.

## TABLE III. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES, AUGUST, 1968

| SEROTYPE | DOMESTIC ANIMALS AND THEIR ENVIRONMENT | | | | | | | ANIMAL FEEDS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CHICKENS | TURKEYS | SWINE | CATTLE | HORSES | OTHER | SUBTOTAL | TANKAGE | VEGETABLE PROTEIN | OTHER | SUBTOTAL |
| *anatum* | 4 | | 2 | | | | 6 | 8 | | 3 | 11 |
| *bareilly* | | | | | | | — | | | | — |
| *blockley* | 11 | 2 | 1 | | | | 14 | 5 | | | 5 |
| *braenderup* | | | | | | | | | | | — |
| *bredeney* | 2 | 1 | 2 | | | | 5 | 5 | | | 5 |
| *chester* | 1 | 1 | | | | | 2 | | | | — |
| *cholerae-suis v kun* | | | 14 | | | | 14 | | | | — |
| *cubana* | 1 | | | | | | 1 | 10 | | | 10 |
| *derby* | 2 | 1 | 6 | | | | 9 | 7 | | 1 | 8 |
| *enteritidis* | 6 | | 1 | 1 | | 1 | 9 | | | | — |
| *give* | | 1 | | | | | 1 | 3 | | 1 | 4 |
| *heidelberg* | 26 | 18 | 1 | | | 1 | 46 | | | 2 | 2 |
| *indiana* | | | | | | | — | | | | — |
| *infantis* | 18 | 1 | | | | | 19 | | | 1 | 1 |
| *java* | | | | | | | — | 3 | | | 3 |
| *javiana* | | | | | | | — | | | | — |
| *litchfield* | | | | | | | — | | | | — |
| *livingstone* | | 1 | 1 | | | | 2 | | | 9 | 9 |
| *manhattan* | | 2 | | | | | 2 | | | | — |
| *miami* | | | | | | 1 | 1 | | | | — |
| *mississippi* | | | | | | | — | | | | — |
| *montevideo* | 5 | | | | | 1 | 6 | 14 | | 5 | 19 |
| *muenchen* | 1 | 2 | | | | | 3 | | | | — |
| *newington* | 1 | 1 | | 1 | | | 3 | | | | — |
| *newport* | 1 | 2 | | 7 | 1 | 1 | 12 | | | | — |
| *oranienburg* | | | | | | | — | 2 | | | 2 |
| *panama* | | | 1 | | | | 1 | | | | — |
| *paratyphi B* | | | | | | | — | | | | — |
| *reading* | | 2 | | | | | 2 | | | | — |
| *saint-paul* | 1 | 12 | | | | | 13 | 1 | | | 1 |
| *san-diego* | | 7 | | | | 1 | 8 | | | | — |
| *schwarzengrund* | 3 | | | | | | 3 | | | | — |
| *senftenberg* | | 1 | | | | | 1 | 4 | | 2 | 6 |
| *tennessee* | | 4 | | | | | 4 | 5 | | | 5 |
| *thompson* | 10 | | | | | | 10 | | | | — |
| *typhi* | | | | | | | — | | | | — |
| *typhimurium* | 14 | 18 | 7 | 14 | 4 | 9 | 66 | 15 | | 2 | 17 |
| *typhimurium v cop* | 7 | 1 | 1 | 1 | | 20 | 30 | | | | — |
| *weltevreden* | | | | | | 1 | 1 | | | | — |
| *worthington* | 2 | | | | | | 2 | 4 | | | 4 |
| TOTAL | 116 | 78 | 37 | 24 | 5 | 36 | 296 | 86 | — | 26 | 112 |
| ALL OTHER* | 8 | 8 | 2 | 6 | — | 2 | 26 | 36 | — | 14 | 50 |
| **TOTAL** | **124** | **86** | **39** | **30** | **5** | **38** | **322** | **122** | **—** | **40** | **162** |

* See Table IV

TABLE III – Continued

| WILD ANIMALS AND BIRDS | REPTILES AND ENVIRONMENT | HUMAN DIETARY ITEMS | | | | | | MISCELLANEOUS | TOTAL | CUMULATIVE TOTAL | SEROTYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EGGS AND PRODUCTS | POULTRY | RED MEAT | DAIRY PRODUCTS | OTHER | SUBTOTAL | | | | |
| 1 | | | | 3 | 3 | | 6 | 2 | 26 | 403 | *anatum* |
| | | | | 2 | | | 2 | | 2 | 23 | *bareilly* |
| 3 | | | | | | | – | | 22 | 155 | *blockley* |
| | | | | | | | – | 1 | 1 | 22 | *braenderup* |
| | | | | 4 | | | 4 | 1 | 15 | 89 | *bredeney* |
| 1 | | | | | | | – | | 3 | 40 | *chester* |
| | | | | | | | – | | 14 | 77 | *cholerae-suis v kun* |
| | | | | 1 | 1 | | 2 | 5 | 18 | 237 | *cubana* |
| | | | | 5 | | | 5 | 2 | 24 | 174 | *derby* |
| 1 | | 1 | | | 1 | | 2 | | 12 | 109 | *enteritidis* |
| | | | | | | | – | 1 | 6 | 42 | *give* |
| 3 | | 6 | | | | | 6 | 7 | 64 | 485 | *heidelberg* |
| | | | | | | | – | | – | 5 | *indiana* |
| | | | | | | | – | 7 | 27 | 283 | *infantis* |
| | | | | | | | – | | 3 | 14 | *java* |
| | | | | | | | – | 1 | 1 | 10 | *javiana* |
| | | | | | | | – | | – | 1 | *litchfield* |
| | | | | | | | – | | 11 | 82 | *livingstone* |
| | | | | | | | – | | 2 | 12 | *manhattan* |
| | | | | | | | – | | 1 | 10 | *miami* |
| | | | | | | | – | | – | – | *mississippi* |
| | | | | 1 | 1 | 4 | 6 | 3 | 34 | 349 | *montevideo* |
| | | | | | | | – | | 3 | 31 | *muenchen* |
| 1 | 1 | | | | | | – | | 5 | 69 | *newington* |
| | 1 | | | | | | – | | 13 | 152 | *newport* |
| | | | | | | | – | 2 | 4 | 131 | *oranienburg* |
| | | | | | | | – | | 1 | 27 | *panama* |
| | | | | | | | – | | – | 6 | *paratyphi B* |
| | | | | | | | – | | 2 | 17 | *reading* |
| 2 | 4 | | | | | | – | | 20 | 296 | *saint-paul* |
| | | | | | | | – | | 8 | 33 | *san-diego* |
| | 1 | | | | | | – | | 4 | 57 | *schwarzengrund* |
| 3 | | | | 18 | | | 18 | 1 | 29 | 229 | *senftenberg* |
| | | | | 2 | 1 | | 3 | 8 | 20 | 122 | *tennessee* |
| 1 | | | | | | | – | 1 | 12 | 194 | *thompson* |
| | | | | | | | – | | – | – | *typhi* |
| 21 | | 15 | | 1 | 1 | | 17 | 2 | 123 | 791 | *typhimurium* |
| | | 3 | | | | | 3 | 2 | 35 | 197 | *typhimurium v cop* |
| | | | | | | | – | | 1 | 7 | *weltevreden* |
| | | | | 11 | | | 11 | | 17 | 93 | *worthington* |
| 37 | 7 | 25 | – | 48 | 8 | 4 | 85 | 46 | 583 | 5,074 | TOTAL |
| 9 | 4 | – | – | 12 | – | – | 12 | 13 | 114 | 1,213 | ALL OTHER* |
| 46 | 11 | 25 | – | 60 | 8 | 4 | 97 | 59 | 697 | 6,287 | TOTAL |

## TABLE IV. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES, AUGUST, 1968

| SEROTYPE | DOMESTIC ANIMALS AND THEIR ENVIRONMENT | | | | | | | ANIMAL FEEDS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | CHICKENS | TURKEYS | SWINE | CATTLE | HORSES | OTHER | SUBTOTAL | TANKAGE | VEGETABLE PROTEIN | OTHER | SUBTOTAL |
| *alachua* | 1 | | | | | | 1 | 5 | | 2 | 7 |
| *albany* | 1 | 1 | | | | | 2 | 1 | | | 1 |
| *amsterdam* | | | | | | | — | | | | — |
| *arkansas* | | | | | | | — | 1 | | 1 | 2 |
| *binza* | | 1 | 1 | | | 1 | 3 | | | 2 | 2 |
| *california* | 1 | | | | | | 1 | | | 2 | 2 |
| *cerro* | | 2 | | | | | 2 | 2 | | | 2 |
| *drypool* | | | | | | | — | | | 1 | 1 |
| *dublin* | | | | 5 | | 1 | 6 | | | | — |
| *eimsbuettel* | | 2 | | | | | 2 | 14 | | 3 | 17 |
| *gallinarum* | | 1 | | | | | 1 | | | | |
| *illinois* | | | | | | | — | 1 | | | 1 |
| *kentucky* | 1 | | | | | | 1 | 2 | | | 2 |
| *lexington* | | 1 | | | | | 1 | | | | — |
| *meleagridis* | | | | | | | — | 2 | | 2 | 4 |
| *minnesota* | | | | | | | — | | | | — |
| *muenster* | 1 | | | | | | 1 | | | | — |
| *ohio* | 2 | | | | | | 2 | | | 1 | 1 |
| *orion* | 1 | | | | | | 1 | | | | — |
| *pomona* | | | | | | | — | 1 | | | 1 |
| *poona* | | | | | | | — | | | | — |
| *pullorum* | | | | | | | — | | | | — |
| *siegburg* | | | 1 | | | | 1 | | | | — |
| *simsbury* | | | | | | | — | | | | — |
| *stanley* | | | | | | | — | | | | — |
| *taksony* | | | | | | | — | 4 | | | 4 |
| *thomasville* | | | | | | | — | | | | — |
| *urbana* | | | | | | | — | 1 | | | 1 |
| *wassenaar* | | | | | | | — | | | | — |
| TOTAL | 8 | 8 | 2 | 5 | — | 2 | 25 | 34 | — | 14 | 48 |
| NOT TYPED* | — | — | — | 1 | — | — | 1 | 2 | — | — | 2 |
| **TOTAL** | **8** | **8** | **2** | **6** | **—** | **2** | **26** | **36** | **—** | **14** | **50** |

*See Table V-B

TABLE IV – Continued

| WILD ANIMALS AND BIRDS | REPTILES AND ENVIRONMENT | HUMAN DIETARY ITEMS | | | | | | MISCELLANEOUS | TOTAL | CUMULATIVE TOTAL | SEROTYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EGGS AND PRODUCTS | POULTRY | RED MEAT | DAIRY PRODUCTS | OTHER | SUBTOTAL | | | | |
| 3 | | | | | | | – | 1 | 9 | 35 | *alachua* |
| | | | | | | | – | | 6 | 10 | *albany* |
| | | | | 3 | | | 3 | | 3 | 13 | *amsterdam* |
| | | | | | | | – | | 2 | 2 | *arkansas* |
| | | | | | | | – | | 5 | 52 | *binza* |
| | | | | 7 | | | 7 | 1 | 11 | 62 | *california* |
| | | | | | | | – | 2 | 6 | 103 | *cerro* |
| | | | | | | | – | | 1 | 16 | *drypool* |
| 1 | | | | | | | – | 2 | 9 | 37 | *dublin* |
| 1 | | | | | | | – | | 20 | 187 | *eimsbuettel* |
| | | | | | | | – | | 1 | 7 | *gallinarum* |
| | | | | | | | – | 1 | 2 | 7 | *illinois* |
| | | | | | | | – | | 3 | 87 | *kentucky* |
| | | | | | | | – | | 1 | 22 | *lexington* |
| | | | | | | | – | 1 | 5 | 24 | *meleagridis* |
| | 1 | | | | | | – | 1 | 2 | 68 | *minnesota* |
| | | | | | | | – | | 1 | 9 | *muenster* |
| 1 | | | | | | | – | | 4 | 9 | *ohio* |
| | | | | | | | – | | 1 | 12 | *orion* |
| | | | | | | | – | | 1 | 8 | *pomona* |
| | 2 | | | | | | – | | 2 | 13 | *poona* |
| 1 | | | | | | | – | | 1 | 47 | *pullorum* |
| | | | | | | | – | 1 | 2 | 47 | *siegburg* |
| | | | | | | | – | 2 | 2 | 11 | *simsbury* |
| 1 | | | | | | | – | | 1 | 1 | *stanley* |
| | | | | | | | – | | 4 | 12 | *taksony* |
| | | | | 2 | | | 2 | | 2 | 43 | *thomasville* |
| | | | | | | | – | | 1 | 11 | *urbana* |
| | 1 | | | | | | – | | 1 | 2 | *wassenaar* |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 8 | 4 | – | – | 12 | – | – | 12 | 12 | 109 | 1,157 | TOTAL |
| 1 | – | – | – | – | – | – | – | 1 | 5 | 56 | NOT TYPED* |
| 9 | 4 | – | – | 12 | – | – | 12 | 13 | 114 | 1,213 | TOTAL |

## TABLE V. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY, AUGUST, 1968

### A. HUMAN SOURCES

| REPORTING CENTER | GROUP | | | | | TOTAL |
|---|---|---|---|---|---|---|
| | B | $C_1$ | $C_2$ | D | H | UNK | |
| ALASKA | 1 | 1 | | | | | 2 |
| ARKANSAS | | 1 | 1 | | | | 2 |
| DISTRICT OF COLUMBIA | 12 | 3 | | 5 | | 3 | 23 |
| FLORIDA | 1 | | | | | | 1 |
| IOWA | 1 | | | | | 1 | 2 |
| MASSACHUSETTS | 1 | | | | | | 1 |
| MISSISSIPPI | 2 | | 1 | | | | 3 |
| NEBRASKA | | | | | | 7 | 7 |
| NEW HAMPSHIRE | 5 | 1 | | 2 | | | 8 |
| NEW MEXICO | 15 | | 4 | | 1 | | 20 |
| NEW YORK - A | | | | | | 39 | 39 |
| NEW YORK - C | 2 | | | | | | 2 |
| NORTH DAKOTA | | | | | | 2 | 2 |
| OREGON | 1 | | | 6 | | 1 | 8 |
| RHODE ISLAND | 4 | | | 1 | | | 5 |
| SOUTH CAROLINA | | | | | | 1 | 1 |
| TEXAS | 2 | 2 | 10 | | | 5 | 19 |
| WISCONSIN | | | | | | 3 | 3 |
| **TOTAL** | 47 | 8 | 16 | 14 | 1 | 62 | 148 |

### B. NONHUMAN SOURCES

| SOURCES | GROUP | | | | | TOTAL |
|---|---|---|---|---|---|---|
| | B | $C_1$ | $C_2$ | D | H | UNK | |
| DOMESTIC ANIMALS AND THEIR ENVIRONMENT | 1 | | | | | | 1 |
| ANIMAL FEEDS | | | | | | 2 | 2 |
| WILD ANIMALS AND BIRDS | 1 | | | | | | 1 |
| REPTILES AND ENVIRONMENT | | | | | | | — |
| HUMAN DIETARY ITEMS | | | | | | | — |
| MISCELLANEOUS | | | | | | 1 | 1 |
| **TOTAL** | 2 | — | — | — | — | 3 | 5 |