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ROBERT A TAFT SANITARY ENGINEER
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REPORT NO. 41
September 30, 1965

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COMMUNICABLE DISEASE

SALMONELLA

SURVEILLANCE

TABLE OF CONTENTS
For the Month of August 1965

- I. SUMMARY
- II. REPORTS OF ISOLATIONS FROM THE STATES
- III. CURRENT INVESTIGATIONS
- IV. REPORTS FROM STATES
- V. SPECIAL REPORTS
- VI. INTERNATIONAL
- VII. FOOD AND FEED SURVEILLANCE

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 to:

Chief, Salmonella Surveillance Unit, Communicable Disease Center, Atlanta, Georgia 30333

Communicable Disease Center
Epidemiology Branch
Investigations Section
Salmonella Surveillance Unit

Veterinary Public Health Section
Veterinary Public Health Laboratory

Laboratory Branch
Bacteriology Section
Enteric Bacteriology Unit

Dr. James L. Goddard, Chief
Dr. Alexander D. Langmuir, Chief
Dr. Philip S. Brachman, Chief
Dr. Richard N. Collins, Chief
Dr. Albert R. Martin
Dr. Read F. McGehee
Dr. Arnold F. Kaufmann
Mr. James B. Goldsby, Statistician

Dr. James H. Steele, Chief
Mrs. Mildred M. Galton, Chief
Dr. John R. Boring

Collaborators

Dr. Philip R. Edwards, Chief
Dr. William H. Ewing, Chief

TABLE OF CONTENTS

	<u>Page</u>
I. SUMMARY	1
II. REPORTS OF ISOLATIONS FROM THE STATES	1
A. Human	1
B. Nonhuman	2
III. CURRENT INVESTIGATIONS	2
Outbreak of <u>Salmonella meleagridis</u> Gastroenteritis in a Delicatessen.	2
IV. REPORTS FROM THE STATES	4
A. Hawaii -	4
(1) Recent Increase in Isolations of <u>Salmonella</u> <u>bovis-morbificans</u> .	4
(2) Sporadic Salmonella Cases Related to a Single Restaurant.	5
B. Texas - Documentation of Two Separate <u>Salmonella</u> <u>typhi</u> Foci in the Same Carrier.	6
C. Washington - Two Outbreaks of <u>Salmonella enteritidis</u> Infection Traced to Frozen Turkeys.	6
V. SPECIAL REPORTS	7
Editorial - Role of Meat-Slicing Equipment in Outbreaks of Salmonellosis.	7
VI. INTERNATIONAL	8
A. Canada - Report of Isolations of Salmonellae From Human and Nonhuman Sources - 1964.	8
B. Germany - Report of Salmonella Isolations - First Quarter 1965.	9
C. Switzerland - Report of Two Salmonella Epidemics in Switzerland, 1964.	10
VII. FOOD AND FEED SURVEILLANCE	10
A. Examination of Frozen Foods.	10
B. Abstract: A System for Detecting Salmonellae in Meat and Meat Products.	10
C. Announcement of Course on Salmonella Methods.	11

I. SUMMARY

A total of 1887 isolations of salmonella from humans was reported during August. This represented an average of 472 isolations per week for an increase of 22 over July, 1965 and 28 over August, 1964. Figure 1 demonstrates that the increasing seasonal incidence seen for this time of year is not unexpected from data recorded for 1963 and 1964.

There were 659 nonhuman isolations of salmonella reported during August for a decrease of 110 from July, a month which included late reports from the National Animal Disease Laboratory, Ames, Iowa. This month's figure represented an increase of 148 isolations over August, 1964.

This issue includes the final analysis of an outbreak of Salmonella meleagridis gastroenteritis related to a Washington, D. C. delicatessen. This article along with a special editorial report on the role of meat-slicers in salmonella infections emphasizes the importance of environmental contamination in the preparation of food. Two outbreaks of salmonellosis in Switzerland are described in the International Section.

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

The seven serotypes most frequently recovered from humans during August were:

<u>Rank</u>	<u>Serotypes</u>	<u>Number</u>	<u>Per Cent</u>	<u>Rank Last Month</u>
1	<u>S. typhi-murium</u> & <u>S. typhi-murium</u> var. <u>copenhagen</u>	613	32.5	1
2	<u>S. newport</u>	151	8.0	3
3	<u>S. heidelberg</u>	144	7.6	2
4	<u>S. infantis</u>	114	6.0	6
5	<u>S. enteritidis</u>	90	4.8	4
6	<u>S. thompson</u>	73	3.9	7
7	<u>S. saint-paul</u>	65	3.4	5
	Total	1,419	65.3	

Total (all serotypes - August) 1,887

These seven serotypes accounted for 66.2 per cent of all 1,887 isolations reported during August. The total number of different serotypes reported this month is 67.

The appearance of S. thompson on the above list for the second straight month is the result of a nursery outbreak in a hospital in Long Island, New York. No detailed report of this outbreak is available as yet, but preliminary information indicated that there was only a small number of symptomatic cases with the vast majority of cases being asymptomatic carriers discovered from a culture survey of infants and hospital personnel.

The age and sex distribution is consistent with past experience (Table IV).

B. Nonhuman

During the month of August, reports were received of 659 salmonella isolations from nonhuman sources. While this number is a decrease of 110 from those reported in July, it is still slightly above the average number reported during previous months of 1965. There were 60 serotypes identified among those submitted from 34 states.

The seven most common types reported for August were as follows:

<u>Rank</u>	<u>Serotype</u>	<u>Number</u>	<u>Per Cent</u>	<u>Standing Last Month</u>
1	<u>S. typhi-murium</u> <u>S. typhi-murium</u> , var <u>copenhagen</u>	100	15.2	1
2	<u>S. heidelberg</u>	100	15.2	2
3	<u>S. oranienburg</u>	57	8.6	Not listed
4	<u>S. infantis</u>	43	6.5	4
5	<u>S. anatum</u>	37	5.6	Not listed
6	<u>S. senftenberg</u>	21	3.2	Not listed
7	<u>S. blockley</u> <u>S. chester</u>	20 20	3.0 3.0	Not listed 7

These seven types accounted for 60.3 per cent of the total.

Thirty-eight of the 57 cultures of S. oranienburg were recovered from turtles, alligators, or turtle tank water, and reported from Kansas. Similarly, sixteen of the twenty-one cultures of S. senftenberg were isolated from turkeys and reported from Minnesota.

The four species from which most of the isolations were obtained in order of frequency are: turkeys, 198 (30.0 per cent); chicken, 146 (22.2 per cent); cattle, 29 (4.4 per cent); swine, 23 (3.5 per cent).

Two rare serotypes were reported for the second time to the Salmonella Surveillance Unit. Salmonella ruiru reported from poultry by-products from Maryland in April was reported this month from animal feed in Florida. Salmonella drypool isolated from a cow in Florida in August was reported this month in Wisconsin from bone meal. Salmonella taksony reported on several occasions from turkeys was recovered from animal feed from Delaware this month.

III. CURRENT INVESTIGATIONS

Outbreak of Salmonella meleagridis Gastroenteritis In a Delicatessen. Reported by Frederick C. Heath, M.D., Deputy Director of Public Health, District of Columbia Health Department, and Arnold Kaufmann, D.V.M., Investigations Section, CDC.

An outbreak of diarrhea was reported among persons attending catered parties on June 5 and June 6, 1965, in the vicinity of Washington, D. C. At each of the parties a variety of foods from the same caterer had been served. Of approximately 580 persons attending the affairs, 431 were contacted and 198 (46.4 percent) reported diarrheal illness which occurred at a mean of twenty hours after eating. The symptoms were moderately severe diarrhea, abdominal cramps and low-grade fever. Ages of the victims ranged from three to eighty years. One patient was hospitalized and 59 required the services of a physician. Salmonella isolations were made both from foods served at the parties and from patients. Among those with positive stool cultures, 56 were found to be excreting S. meleagridis, one S. chester, and two S. tennessee. An additional 142 illnesses were reported following newspaper publicity concerning

the outbreak. All but one of these persons had purchased food from the involved delicatessen between June 4 and June 7. One had eaten at the establishment on May 31. Nineteen persons among the call-in group were found positive by culture for S. meleagridis. Thus, there were a total of 356 known cases of salmonellosis which occurred between May 10 and June 7. The results of food cultures from the catered parties and delicatessen are shown in the accompanying table:

Results of Food Cultures
Positive for S. meleagridis

Foods for Consumption (No. positive/No. cultures)				Raw Foods	
Beef peppers	(0/1)	Pepper beef	(0/1)	Beef (frozen)	(0/1)
Bologna	(1/1)	Pig-in-a-blanket	(1/1)	Corned beef (raw)	(0/3)
Chopped liver	(1/4)	Potato pancakes	(0/1)	Egg noodles	(0/1)
Cole slaw	(1/7)	Potato salad	(3/8)	Egg whites (frozen)	(0/3)
Corned beef	(8/8)	Ring sausage	(0/1)	Mayonnaise	(0/2)
Eclair	(0/1)	Ripe olives (opened)	(1/1)	Pastrami	(0/3)
Egg roll	(0/1)	Roast beef	(7/7)	Spiced beef	(0/1)
Egg salad	(0/1)	Salami	(2/4)	Turkey (frozen)	(0/1)
Fish (various)	(1/7)	Sauerkraut	(0/1)	Turkey rolls	(0/4)
Frankfurters	(2/3)	Spiced beef	(3/3)	Whole eggs (frozen)	(0/5)
Kishka	(0/1)	Stuffed cabbage	(0/1)		
Knishes	(0/2)	Stuffed green olives (open)	(1/1)		
Kugle	(1/1)				
Layer cake	(0/1)	Tongue	(1/2)		
Pastrami	(1/2)	Turkey	(5/6)		

The firm involved was a combination caterer-delicatessen-restaurant. It catered up to ten parties a month and handled a large volume of restaurant-delicatessen trade. It was conservatively estimated that four thousand people consumed food from this concern between June 4 and June 7. The firm employed approximately 103 full-time and part-time employees. A complete stool culture survey of the food handlers was undertaken. Of the 103 employees cultured 57 were found to be positive for S. meleagridis. All but one of these denied any illness.

Environmental investigation of the premises revealed many sanitary defects. Most of these were related to a general lack of cleanliness and poor food handling practices. Particularly significant findings were: (1) lack of hand-washing facilities, (2) inadequate employee restrooms, (3) presence of many cockroaches and flies, (4) a malfunctioning dishwasher, (5) a non-refrigerated delivery truck, and (6) inadequate routine clean-up of food processing areas. Fifty-nine environmental cultures were obtained on June 15; three of these were positive for S. meleagridis. These were from a meat slicer (one isolation) and a food grinder (two isolations).

Following an extensive clean-up and remodeling the firm was allowed to reopen on June 21 using only those employees who had had two successive negative rectal cultures. On June 28 an additional twenty-six environmental swabs were taken. Salmonella meleagridis was again cultured from a critical area - the blade of a meat slicer. Accordingly, the establishment was again voluntarily closed on June 30. A more extensive clean-up program including complete dismantling and decontamination of food handling areas and in particular meat slicers and food grinders was then undertaken.

In addition, all employees were again cultured. A total of eleven food handlers who had been previously cleared for return to work on the basis of two negative cultures were found to again be excreting S. meleagridis. The summary of the cultures on food handlers involved in the establishment is shown in the accompanying table.

RESULTS OF RECTAL CULTURES OF
DELICATESSEN EMPLOYEES

<u>Date</u>	<u>Number Cultured</u>	<u>Number Positive</u> ¹	<u>Percent Positive</u>
May 18, 19	11	7	63.6
June 2,3	10	4	40.0
June 7 - 30	103	57 ³	55.3
July 1 - 6	63 ²	11 ³	17.6

1. All S. meleagridis except as noted.
2. New employees and employees who had returned to work on the basis of two successive negative rectal cultures.
3. Includes two dual infections with S. typhi-murium and one with only S. typhi-murium; also a dual infection with S. tennessee.

It is postulated that S. meleagridis was introduced into this delicatessen by either food or a carrier, and subsequently spread to many food handlers, and food items, as well as the environment.

Upon correction of still existing sanitary defects the establishment was allowed to reopen, utilizing only employees with three successive negative rectal swabs. The following recommendations were made for future surveillance of the establishment; (1) observation and rigid enforcement of sanitary food handling practices, and personal hygiene of the employees to be supervised by a trained sanitarian, (2) no employees to return to work without three successive negative rectal cultures, (3) periodic environmental culture surveys of key areas such as the slicers, and foods in the display cases to be made, (4) employees who had been positive at any time during the outbreak were to be re-cultured at one, two, four and six month intervals.

IV. REPORTS FROM THE STATES

A. Hawaii

- (1) Recent Increase In Isolations of Salmonella bovis-morbificans in Hawaii. Reported by Ralph B. Berry, M.D., Chief, Epidemiology Branch and Harold T. Matsuura, Communicable Disease Investigator, Hawaii Department of Health.

During July and August, 1965, an increase in the number of isolations of S. bovis-morbificans was noted. During this period sixteen symptomatic and one asymptomatic cases were reported. This is in contrast to a total of only two isolations of this serotype in Hawaii during 1963 and 1964. Of the seventeen cases, ten were adults and seven were children. Ages ranged from three months to 69 years. Five ethnic groups were represented. Despite intensive epidemiologic investigation of these cases no definite common source was established. Epidemiologic data on four of the cases with stool cultures positive for S. bovis-morbificans as shown in the table on the next page.

<u>Age</u>	<u>Sex</u>	<u>Ethnic Group</u>	<u>Onset Date</u>	<u>Comment</u>
54	M	Caucasian	July 5	Ate pit-roasted pork and hog viscera prior to illness.
25	M	Filipino		No symptoms but hog viscera a frequent dietary item.
27	M	Chinese		Pork and fowl on day prior to onset of symptoms.
32	M	Caucasian	July 25	Pork and fowl on day prior to onset of symptoms.

It is the feeling of the investigators that fresh pork or fowl from a common abattoir or packaging firm could have been a potential common source for these cases. The isolation of S. bovis-morbificans from swabbings of a pan containing thawed pork intestine in the accompanying report of a restaurant-associated outbreak gives evidence of the fact that this serotype is present in the swine population of Hawaii.

- (2) Sporadic Salmonella Cases Related to a Single Restaurant. Reported by Ralph B. Berry, M.D., Chief, Epidemiology Branch, and Harold T. Matsuura, Communicable Disease Investigator, Hawaii Department of Health.

Between February 24 and July 4, 1965, eight cases of salmonellosis associated with a single restaurant were reported. On February 24, three individuals developed symptoms of gastroenteritis. One of these, a 34-year-old male, was cultured and found positive for Salmonella infantis. All three had a common meal at the restaurant, but the exact date, time and types of food consumed were not recorded.

A second incident was reported involving a 40-year-old male who ate at the restaurant on the evening of April 30. Foods consumed were raw salmon, smoked beef and Kalua pork. He developed symptoms of gastroenteritis the following day, and a stool culture from this individual yielded salmonella (Group C₁).

Two of three individuals who shared a luncheon at the restaurant on April 28 developed symptoms of gastroenteritis the following day. Their meal consisted of poi, raw fish, naaupua (pork intestine), pipikaula (beef jerky), and oke (raw liver). Salmonella colorado was isolated from one of the cases; the other was not cultured. The asymptomatic individual was negative on culture.

A fourth incident was noted as the result of a luncheon shared by five people on July 23. Two males, ages 27 and 30, became ill with gastroenteritis early the following morning. Salmonella infantis was isolated from both. No illness was noted in the families or either man, and the only food shared in common was at the luncheon. The menu consisted of a variety of Hawaiian dishes, and included lokopau'a, made from washed, chopped, and boiled hog viscera. This last item was eaten by both men.

As a result of this series of cases, two separate investigations were made at the restaurant on June 14 and July 9. On June 14, sixteen environmental swabs were obtained and S. infantis and S. anatum were recovered from the sink drainboard and a sink. Salmonella cerro was isolated from a pan containing raw pork intestine. Stool cultures were obtained from seven employees, and a cook was found positive on culture for S. anatum and S. infantis. A kitchen helper was positive for S. infantis and

Arizona species and one further kitchen helper was positive for Arizona species.

On July 9, a second visit was made to the restaurant. At this time, S. derby was isolated from a stainless steel sink drainboard and S. bovis-morbificans was isolated from a pan containing thawed, raw hog intestine. Salmonella derby and S. anatum were isolated from the hands of a cook after the preparation of thawed, hog intestine.

Unpublished data from the Hawaii State Laboratories listed S. anatum, S. colorado and S. infantis as having been isolated from swine. The isolation of S. cerro in this study was the first from a nonhuman source in Hawaii. It is felt that this series of cases is related to the cleaning of raw hog viscera immediately adjacent to areas where other foods are prepared and stored prior to serving. The recovery of salmonellae from the hands of the cook after handling this product demonstrates the ease with which it may be transferred to other foods where incubation and multiplication can occur.

B. Texas

Documentation of Two Separate Salmonella typhi Foci in the Same Carrier. Reported by J. E. Peavy, M.D., Commissioner of Health, Texas State Department of Health, H. E. Smith, M.D., Chief, Section of Preventive Medicine, Van C. Tipton, M. D., Director of Clinical Disease Division, M. S. Dickerson, M.D., Medical Consultant, Communicable Disease Division, Texas State Health Department.

On June 4, 1965, the Texas State Health Department confirmed a culture of Salmonella typhi phage type E.1 submitted from a hospital laboratory in Abilene, Texas. The organism had been isolated from a surgically removed kidney. Consultation with the pathologist involved revealed that the kidney showed hydronephrosis and hydro-ureter, secondary to ureteral obstruction by a calculus. In addition, there was acute and chronic pyelitis with micro-abscess formation.

The patient was interviewed and two stool specimens were obtained. These were also found positive for S. typhi, phage type E.1. A subsequent interview indicated that both parents of the patient had experienced typhoid fever about 1890. In 1923, the patient became ill and was found to have typhoid fever. No known recent cases of typhoid fever in Texas have been attributed to this fecal and urinary typhoid carrier.

Editor's Comment: This report of the occurrence of both renal and biliary foci of typhoid bacilli in a single person is of considerable interest. Renal carriers of typhoid infection are known to occur although this is much less common than the traditional biliary focus. Frequently, as in this report, the establishment of a focus of typhoid bacilli in kidney tissue is the result of a recognizable chain of events. Chronic pyelitis due to S. typhi leads eventually to stone formation, ureteral obstruction and further destruction of the renal parenchyma frequently with abscess formation.

C. Washington

Two Outbreaks of Salmonella enteritidis Infection Traced to Frozen Turkeys. Reported by Herb W. Anderson, Epidemiologic Assistant and Donald R. Peterson, M.D., Director, Division of Epidemiology and Communicable Disease Control, Seattle/King County Health Department.

During the week of June 20, 1965, there were two outbreaks due to Salmonella enteritidis which involved a total of five families in Seattle, Washington. The most prominent symptoms were diarrhea, abdominal pain and fever; incubation periods ranged from 18 to 86 hours. Two persons were hospitalized, and the duration of illness was from two to seven days. Ten stool specimens yielded S. enteritidis.

The first outbreak followed a turkey barbecue on June 20, attended by members of three families. A 15-pound frozen turkey had been purchased on June 19, and the following day the turkey was cooked on a rotisserie over a charcoal fire for ten hours. The heat was sufficiently variable so that the bird was not thoroughly cooked, and the meal was noticed to be rare around the drumsticks. Nine persons, including members of all three families who attended the picnic, became ill with gastroenteritis. The bacterial agent was isolated from six of the nine people. In addition, S. enteritidis was obtained from samples of the remaining turkey meat ten days after the barbecue.

The second outbreak involved two families in the same neighborhood. They had purchased a 14-pound frozen turkey and allowed it to thaw overnight as recommended on the label. The following day the turkey was stuffed with dressing and then oven-cooked at 325°F for five and one-half hours. The family ate the turkey throughout the next week. Six members became ill and in three cases S. enteritidis could be isolated from the stool. Two members of a neighboring family became ill when they were served turkey sandwiches from the same source. The turkeys involved in both outbreaks were purchased at different grocery stores of the same chain. They were part of a large lot of grade A yearling hens that had been purchased from a Utah processing plant and distributed to the company's stores in northwestern Washington. Two frozen turkeys from the same lot as sold on June 19 were obtained and S. enteritidis was isolated from both.

Editor's Comment: This outbreak reflects an important public health problem. It is well known that many types of poultry are frequently contaminated with salmonella. One important source of these organisms is the use of infected feed. Subsequently, when an infected bird enters a processing plant, both the environment of the plant and other birds being processed may become contaminated. In the first case, it appears that incomplete cooking of the contaminated turkey allowed the spread of infection. In the second outbreak, however, the time and heat used in preparation would seem adequate even though stuffing delays the penetration of heat into the turkey meat. More likely possibilities in this instance are recontamination after cooking by utensils used in preparation or recontamination by the person who handled the raw infected bird.

V. SPECIAL REPORTS

Editorial: The Role of Meat-slicing Equipment in Outbreaks of Salmonellosis.

In the last 24 months a number of outbreaks of salmonellosis have been reported in which meat slicers have played an important role in transmission. Perhaps the most celebrated of these is the outbreak in Aberdeen, Scotland, in 1964 which resulted in over 400 cases of typhoid fever. Imported corned beef is thought to have been the initial origin of this widespread infection, but it is theorized that contamination of the meat-slicing area was significant in establishing a reservoir for cross contamination of other meat products. In 1964 an outbreak of salmonellosis associated with a delicatessen occurred in Denver, Colorado (SSR #34). Approximately 54 persons became ill following parties catered by this delicatessen. Salmonella newington was isolated from several of the involved patients. Cultures obtained from meat slicers in this establishment showed no salmonellae but did yield high coliform counts suggestive of recent contamination.

Dr. Robert Cruickshank, Professor of Bacteriology at Edinburgh Medical School, recently described two interesting outbreaks in the United Kingdom (SSR #40). Salmonella reading was responsible for an acute enteric illness in a fifteen-year-old boy in October 1964. Epidemiologic evidence pointed to Hungarian chopped pork which had been purchased at a local meat shop. The same serotype was isolated from four separate places on a slicing machine. Mild diarrhea had also occurred in six shop workers and subsequent investigation yielded a total of 55 human isolations of S. reading from persons who had purchased cold meats from the shop in question. In May 1965, a family outbreak of gastroenteritis due to S. tennessee involving a man and his

son was attributed to Yugoslavian minced pork purchased from a different shop in the United Kingdom. Subsequent investigations indicated that two additional families who had purchased from this shop on the same date had developed diarrhea. Three staff members in the shop also experienced diarrhea. The total number of human isolations of S. tennessee was 36. The same salmonella organism was recovered from two points on the meat slicing machine, a shelf, and a table on the premises, in addition to the external surfaces of portions of pork and bacon.

In the current issue of the Salmonella Surveillance Report, a summary of an investigation of an extensive delicatessen-related outbreak of salmonellosis in the District of Columbia is reported. At least 356 known cases of salmonellosis were attributed to the various food services of this delicatessen. The vast majority of these persons were found to be excreting S. meleagridis. Nine different types of cold meats were found to be contaminated with the same serotype. In the course of a culture survey of the environment of the delicatessen one isolation of S. meleagridis was made from a meat slicer and two from a nearby meat grinder. The establishment was reopened after what was thought to be an adequate clean-up, but repeat cultures again revealed contamination of the meat-slicing blade. This focus of infection was eradicated only after the machine was completely dismantled, thoroughly cleaned, and decontaminated with an iodine solution.

The meat slicer is a key area in any meat shop. Once any contaminated meat item comes in contact with the blade and surrounding portions of the machine, a reservoir of salmonella infection is established with the potential for contaminating each and every item which is subsequently processed through this machine. Small portions of meat scraps are frequently visible only on close inspection and may persist in inaccessible areas of the machine for an indefinite time. Temperatures are likely to be such that persistent organisms on the blade may remain viable and multiply. Routine practice in most establishments is to give these machines a cursory wiping with a cloth at the end of each day. Because of the danger in handling the razor-sharp blade, these machines are virtually never taken apart and thoroughly cleaned by shop personnel. In some instances the machines are dismantled only at irregular intervals for servicing by technicians from slicing-machine companies.

The problem of how to eliminate this recognized source of salmonella infection is a formidable one. Some consideration should be given in the design and construction of these machines which would allow better access to all areas of the slicer. Additionally, special cleaning brushes designed to adequately reach all portions of the machine could easily be made and marketed for this purpose. A survey of large delicatessen-restaurant establishments conducted by sanitarians in various areas of the country would provide useful information as to how widespread a phenomenon this is. This survey should include close examination and complete dismantling of the meat slicers in order to obtain appropriate bacteriological cultures. Sanitary codes for restaurants should perhaps provide for dismantling, cleansing, and thorough decontamination of these critical areas at regular intervals.

VI. INTERNATIONAL

A. Canada

Report of Isolations of Salmonellae from Human and Nonhuman Sources - 1964.
Reported by J. Yurack, Ph.D., Officer in Charge, Enteric Section, Laboratory of Hygiene, Ottawa, Ontario.

A total of 2,796 isolations of salmonellae were reported from human sources in Canada for 1964. This represents a decrease of 225 (7.4%) from 1963. The seven most frequently isolated serotypes are indicated on the next page.

Human Sources

<u>Rank</u>	<u>Serotype</u>	<u>No. of Isolations</u>	<u>Percent</u>
1	<u>S. typhi-murium</u>	1,209	39.7
2	<u>S. thompson</u>	525	18.8
3	<u>S. heidelberg</u>	253	9.1
4	<u>S. newport</u>	169	6.0
5	<u>S. typhi</u>	102	3.6
6	<u>S. saint-paul</u>	93	3.3
7	<u>S. infantis</u>	88	3.1
	Total	2,339	86.4

A total of 929 isolations of salmonellae were made from nonhuman sources during the 1964 period. This represents a decrease of 216 isolations (18.8%) from the 1963 total of 1,145. Sources of nonhuman isolations encompassed a wide variety of items. The most frequent sources were eggs and egg products, 14.3 percent; poultry and turkey, each 10.3 percent; porcine, 8.7 percent; and pet turtles and turtle environments, 6.5 percent. The seven most frequently isolated serotypes from nonhuman sources are indicated in the table below:

Nonhuman Sources

<u>Rank</u>	<u>Serotype</u>	<u>No. of Isolations</u>	<u>Percent</u>
1	<u>S. typhi-murium</u>	216	23.3
2	<u>S. thompson</u>	92	9.9
3	<u>S. heidelberg</u>	82	8.8
4	<u>S. infantis</u>	73	7.9
5	<u>S. saint-paul</u>	61	6.6
6	<u>S. anatum</u>	58	6.2
7	<u>S. cholera-suis</u>	52	5.5
	Total	634	68.2

During the year four serotypes not previously found in Canada were identified. Salmonella eimsbuettel and S. westersteade were isolated from human cases of infection while S. orion and S. pomona were isolated from turkey litter and an alligator, respectively. This brings to a total of 113, the number of serotypes which have been found to date in Canada.

A particularly fruitful source of salmonellae was turtles. A total of 61 isolations were made, including 19 different serotypes. This was the only source of such types as S. gaminara, S. litchfield, S. livingstone, and S. urbana. Among the most frequent human serotypes S. newport ranked in fourth position. This serotype was responsible for a hospital outbreak in Newfoundland which was attributed to cross-infection due to faulty nursing techniques. Salmonella thompson, which has been one of the most frequent serotypes in Canada for several years, was responsible for an outbreak in Ontario involving 17 persons who became ill after eating coconut cream pie. An elderly carrier in Saskatchewan was responsible for a small outbreak in which seven cases of typhoid fever occurred.

B. Germany

Report on Salmonella Isolations - First Quarter of 1965. Reported by Dr. Rhode, Director of the Salmonella Center, Institute of Hygiene, Hamburg, Germany

During the first quarter of 1965, 412 isolations of salmonella were identified at the Institute of Hygiene in Hamburg, Germany. Of these 177 (34.0 percent) were from humans, 140 (34.0 percent) were from animals, 40 (9.7 percent) were from surface water, and 55 (13.3 percent) were from food and feed.

A total of 105 different serotypes were represented among the 412 isolations made. Some of the more common types were S. typhi-murium, 33; S. richmond, 30; S. paratyphi B, 20; S. enteritidis, 18; S. charity, 15; and S. braenderup, 15. Salmonella richmond and S. charity are extremely rare in the United States. All, except one human recovery of S. richmond, were from animals; Salmonella paratyphi B was recovered from humans and surface water specimens. Ten of 15 S. braenderup isolations were from food and feed; the remainder were from humans. Salmonella enteritidis was recovered primarily from animals, and S. typhi-murium isolations were predominately from humans, food and feed.

C. Switzerland

Report of Two Salmonella Epidemics in Switzerland, 1964. Reported by Professor M. Schaer and J. Dickel, M.D., Institute of Social and Preventive Medicine, University of Zurich.

Two interesting outbreaks of salmonellosis have been documented in Switzerland during 1964. In October 1964, 387 cases of salmonellosis were reported from the parish of Horw, near Lucerne. The onset of the outbreak was explosive and occurred simultaneously in different localities. Questioning of the population traced the source to a dairy and butcher shop where meat and milk were found infected with S. enteritidis. These came from a cow which had aborted and subsequently been slaughtered. Both the milker and the cow were found positive for salmonella. Preventive measures were carried out, including destruction of the involved meat and pasteurization of all milk supplied by Horw. Repeated cultures were then taken of all food handlers.

The second outbreak began early in November when increasing numbers of gastroenteritis cases were reported from the cantons of Zurich, Lucerne and Aargau. The cause of the infection was found to be S. typhi-murium and was traced to smoked sausages produced by a firm in the canton of Berne. The company supplies cooperative stores in different parts of the country. This type of sausage is made of high quality meat, but it is only smoked for two days at 18° to 20°C, and does not undergo a heating process. Organisms were isolated from sausages and massive surface contamination of instruments and tables was found. In addition, three carriers of S. typhi-murium were discovered in both the first and second bacteriologic examinations of 350 company employees. All were negative on the third examination. Thorough equipment and surface disinfection were performed.

Editor's Comment: Salmonella was isolated from instruments and work areas where meat is prepared. As noted elsewhere in this issue, this is a major site of contamination for uninfected foods and an important factor in the maintenance of infection once established.

VII. FOOD AND FEED SURVEILLANCE

A. Examination of Frozen Foods:

Frozen prepared foods obtained on the local retail market are being examined for salmonellae. Thus far 10 samples of chicken and beef pies have been examined and no salmonellae recovered.

B. Abstract:

A System for Detecting Salmonellae in Meat and Meat Products.

These authors found that Selenite F broth inoculated with meat samples was more selective for salmonellae when incubated at 43° C in a water bath instead of a 37° C air incubation. The enrichments incubated for 24 hours were streaked to brilliant green agar (BG) and then reincubated for another 24 hours at 43° C water bath. If negative after the first streak to BG, a second plate is streaked. The method was compared on 125 samples of frozen meat with the method used by the Food Hygiene Laboratory, Colindale, London. Salmonellae were isolated from 30 samples by the modified technique and from 31 samples by the Food Hygiene Laboratory procedures, however, several of the samples were found positive by only one method.

Editor's Comment: It should be emphasized that this higher incubation temperature is recommended only for Selenite F enrichment. McCoy (J. Appl. Bact. 25: 213-224, 1962) found that tetrathionate broth incubated at 43° C is lethal to salmonellae.

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

The Veterinary Public Health Laboratory, Epidemiology Branch, and the Bacteriology Section, Laboratory Branch, at the Communicable Disease Center, will conduct a course on methods for isolating salmonellae from food products and animal feeds. The course will be conducted January 10-21, 1966*, and June 13-24, 1966**. Prerequisite is either six months experience in bacteriology or in quality control laboratory. State, federal, and industry personnel may apply. Applications forms can be obtained through:

Training Office
Laboratory Consultation and Development Section
Laboratory Branch
The Communicable Disease Center
Atlanta, Georgia 30333

*Registration ends November 29, 1965.

** Registration ends May 2, 1966.

TABLE I
SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING **AUGUST, 1965

SEROTYPE	REGION AND REPORTING CENTER																		
	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL					
	MAINE	NH	VT	MASS	RI	CONN	TOTAL	NY-A	NY-BI	NY-C	NJ	PA	TOTAL	OHIO	IND	ILL	MICH	WIS	TOTAL
albany				1			1				2		2	1		4		1	6
anatum																			
atlanta																1			1
bareilly																			
berta																			
blockley	3			3			6	1		5			6	2		1	1		4
bovis-morbificans																			
braenderup										1			1	2					2
bredeney				2		1	3		1				1			1	1		2
butantan																	1		1
carrara																			
cerro																			
chester																1	1	1	3
cholerae-suis																			
cholerae-suis v kun																			
cubana								1					1			1	1	2	4
derby	1			1			2	2	3	2			7			2	3	1	6
eastborne																			
enteritidis	3		1	11			15	7	2	5	5	7	26	1	2	9	7	12	31
essen				1			1												
give																			
guinea															1				1
hartford																			
heidelberg				6		1	7	5	5	9	4	4	27	2	1	8	11	3	25
indiana												1	4						
infantis	1			5		3	9	2	3	1	2	2	10	1	2	9	2	2	16
inverness																			
irumu						1	1	1					1			3			3
java													2			1	1		2
javiana																			
leeuwarden																			
litchfield								1					1						
livingstone																			
manhattan								1					1						2
meleagridis														2					1
miami																			
minnesota																			
mississippi																			
montevideo								3				3	6	1		2	1		4
muenchen				2			2									2			2
muenster				3			3												
new-brunswick																			
newington																			
newport	1			3			4	7	3	3	3	6	22	2	4	12	3		21
oranienburg						1	1	1		2			3	18					18
oslo																			
panama				4		3	7	7	2	1	5		15			1	1	2	1
paratyphi A																			
paratyphi B				1			1		1				1	1	1	1			3
poona													1			1			1
reading																	2	1	3
rubislaw																			
saint-paul				10		1	11	2	2	3		1	8			2	1	3	6
san-diego				2			2									2			3
schwarzengrund				1			1			1			1			3		1	3
senftenberg																			
simsbury									1				1			1	1		2
stanley																			
tamale																			
tennessee			1	1	4		6								2		1		3
thompson				1			1	33	3	4			40	1	1	1	3	2	8
typhi				1			1	1		1			6			1	1	2	5
typhi-murium	1			43	1	12	57	34	28	37	8	41	148	6	12	30	18	14	80
typhi-murium v cop				6			6										6		6
urbana											1		1	3					3
weltevreden																			
worthington																			
group B					1		1							1		1	1		2
group C-1																			1
group C-2																			
group D										1			1						
group E					1		1												
unknown		6					6			1			1			1		2	3
TOTAL	10	6	2	108	7	23	156	110	54	80	32	69	345	44	27	104	69	49	293

New York (A-Albany, B-Beth Israel Hospital, C-City)

*The Beth-Israel Salmonella Typing Center in New York is a reference laboratory and processes many cultures from other states which are assigned to the respective states although reported by N.Y.-B.I. Beth Israel reported a total of 170 isolations for August.

**Includes July late reports.

TABLE I (Continued)
BY SEROTYPE AND REPORTING CENTER

REGION AND REPORTING CENTER

WEST NORTH CENTRAL								SOUTH ATLANTIC									TOTAL	SEROTYPE
MINN	IOWA	MO	ND	SD	NEBR	KAN	TOTAL	DEL	MD	DC	VA	WV	NC	SC	GA	FLA		
		1					1				1				4	2	1	albany
															2			anatum
											1							atlanta
											1					4		bareilly
											1							berta
	1					2	3				1				1	2	4	blockley
																		bovis-morbificans
									2						1	1	4	braenderup
																		bredeney
																		butantan
2		1					3					1			2	1	2	carrau
															1			cerro
											1							chester
															1	1	1	cholerae-suis
															1	1	3	cholerae-suis v kun
						3	3		1							2	1	cubana
									1								8	derby
4							4		3						2		7	eastborne
																		enteritidis
																		essen
2	1	6				1	10		3		2				3	2	3	give
															1			guinea
																		hartford
																		heidelberg
																		indiana
8		2				2	12		1		5				11	2	21	infantis
		1					1											inverness
1						1	2								1		3	irumu
						3	3				3				2	9	14	java
																		javiana
2							2		2								2	leeuwarden
																	1	litchfield
									1							4	6	livingstone
									2								2	manhattan
																		melesgridis
3		1				1	4				2				1	5	8	miami
																		minnesota
															2		2	mississippi
																3	8	montevideo
							1		1	1	5				1	3	6	muenchen
																		muenster
8						4	12									2	2	new-brunswick
1		1				6	8	3	2		1				4	16	30	newington
															3	4	9	newport
															1			oranienburg
		1					1		6								6	oslo
																	1	panama
											2						2	paratyphi A
																		paratyphi B
																		poona
4		2	2			1	9		3						3	8	16	reading
									1						1		2	rubislaw
																		saint-paul
															1		2	san-diego
															1		2	schwarzengrund
											1						2	senftenberg
																		simsbury
																		stanley
						1	1								1		1	tamale
																		tennessee
4		1				2	6		1		2				4	1	8	thompson
							1				2				1	1	7	typhi
23	7	14	4			10	58	1	22	11	8	2	6	12	25	21	107	typhi-murium
																		typhi-murium v cop
																		urbana
																		weltvedren
																	5	worthington
																	1	group B
																		group C-1
																		group C-2
																		group D
											1							group E
																		unknown
62	9	31	6	-0-	-0-	37	145	6	53	19	37	10	27	6	78	101	337	TOTAL

TABLE I (Continued)

S E R O T Y P E	R E G I O N A N D R E P O R T I N G C E N T E R																		
	E A S T S O U T H C E N T R A L					W E S T S O U T H C E N T R A L					M O U N T A I N								
	KY	TENN	ALA	MISS	TOTAL	ARK	LA	OKLA	TEX	TOTAL	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOTAL
albany							2		2	4	1								1
anatum																			
atlanta									1	1									
bareilly										2									
berta																			
blockley		1			1		7		2	9		1							1
bovis-morbificans																			
braenderup									1	1									
bredenev																			
butantan																			
carrau																			
cerro																			
chester																			
cholerae-suis									1	1									
cholerae-suis v kun																			
cubana																			
derby	1				1		2			2		1					2		2
eastborne																	1		2
enteritidis		1			1							4							4
essen																			
give			1		1		6			6									
guinea																			
hartford																			
heidelberg		2	3		5		4			4				2		4	2		8
indiana																	1		1
infantis	3		1		4	1	17		1	19						1	3		4
inverness																1			1
irumu																			
java		1	1		2		1			1	1						1		2
javiana		1		1	2	3	9		2	14						1			1
leeuwarden									1	1									
litchfield														1					
livingstone							1			1									
manhattan																			
meleagridis																			
miami																			
minnesota									1	1									
mississippi			1		1		2			2									
montevideo		1	1		2	1	1	1	2	5							1		1
muenchen										2									
muenster																			
new-brunswick																			
newington							2			2									
newport	3	1			5	3	23		13	39	1								1
oranienburg		1			1		4		5	9									
oslo																			
panama						1	1			2						1			1
paratyphi A																			
paratyphi B									2	2									
poona																			
reading																			
rubislaw							1			1									
saint-paul		3	1		4		1			1				1			4		5
san-diego	1				1									1					1
schwarzengrund																			
senftenberg																			
simsbury							1			1									
stanley																			
tamale																			
tennessee									1	1									
thompson		2	1		3	1	1	1		3	1								1
typhi		4			4	4	2	1	3	10	1								2
typhi-murium		10	2		12	5	15	7	20	47	1	4		4		1	2		12
typhi-murium v cop								1		1									
urbana																			
weltevreden																			
worthington									1	1									
group B				1	1									1	15	1			17
group C-1				1	1										8	1			9
group C-2															2				2
group D																			
group E															1				1
unknown																			
TOTAL	8	28	12	4	52	19	107	11	59	196	6	10	-0-	10	26	11	18	-0-	81

TABLE I (Continued)

REGION AND REPORTING CENTER						OTHER VI	TOTAL	PERCENT OF TOTAL	EIGHT MOS. TOTAL	% 8 MOS. TOTAL	1964 8 MOS. TOTAL	% 1964 8 MOS. TOTAL	S E R O T Y P E
P A C I F I C													
WASH	ORE	CAL	ALASKA	HAWAII	TOTAL								
1		1		4	5		1		4				albany
					26		183						anatam
					2		5						atlanta
					8		69						bareilly
					3		24						berta
2		7		15	7		41	2.2	221	1.7	281	2.1	blockley
					15		15		28		5		bovis-morbificans
					4		4		53		65		braenderup
					7		17		89		134		bredeney
							1		1		1		butantan
		1			1		2		3				carrau
					1		1		7		3		cerro
					7		79		48				chester
					2		7						cholerae-suis
					4		23		27				cholerae-suis v kun
		2		2	4		8	1.9	105	3.6	39	15.2	cubana
					35		467		2,029		456		derby
					1		3						eastborne
					2		90		638				enteritidis
					1		1		3				essen
13	3	31		1	1		12		83		51		give
							1		1				guinea
							16						hartford
					47		144	7.6	1,017	7.8	1,104	8.3	heidelberg
							6		27		30		indiana
1		17		1	19		114	6.0	719	5.5	592	4.4	infantis
							1		4				inverness
							5		5				irumu
					5		21		110		147		java
					1		39		162		143		javiana
1		2		2	5		1		2				leewarden
							6		57		44		litchfield
							2		19		3		livingstone
							14		73		135		manhattan
							3		135		40		meleagridis
	1	8		4	13		8	2.3	55	2.3	26	2.3	miami
					4		5		8		6		minnesota
							22		22				mississippi
							43		303		312		montevideo
							17		130		156		munchen
1		17		1	1		3		6				muenster
							1		6				new-brunswick
							3		39		24		newington
							17	8.0	698	5.3	581	4.4	newport
							4	2.8	53	2.9	344	2.6	oranienburg
1		1		5	5		1		13		7		oslo
							40		147		113		panama
							1		9				paratyphi A
					2		10		116		107		paratyphi B
							2		32		28		poona
1	2	5		3	5		3		16	3.7	28	2.7	reading
							1		3				rubislaw
							65		487		359		saint-paul
							7		197		107		san-diego
							1		8		88		schwarzengrund
		2			2		7		40		73		senftenberg
							1		1				simsbury
							1		6		4		stanley
							1		1				tamale
							11		137		275		tennessee
12	2	3	4	54	3		73	3.9	340	2.6	216	1.6	thompson
					6		41	2.2	487	3.7	459	3.4	typhi
					79		600	31.8	4,086	31.3	3,624	27.2	typhi-murium
							13		133		124		typhi-murium v cop
							4		18		13		urbana
	2			4	4		4		19		14		weltevreden
							3		27		35		worthington
					2		27		189		209		group B
							10		52		58		group C-1
							3		40		36		group C-2
	2				2		2		29		27		group D
							1		45				group E
							13		86		55		unknown
35	14	175	-0-	58	282		1,887		13,067		13,346		TOTAL

(VI - Virgin Islands)

TABLE I-A
 SEROTYPES REPORTED FROM HUMANS PREVIOUSLY DURING 1965
 BUT NOT IN AUGUST

SEROTYPES	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
adelaide	May	Ny-A	1
alachua	Mar	Mass(1)	
	Jul	Tenn(1)	
	Jul	Calif(1)	3
	Jul	NY-BI	1
amager	Jul	Fla	1
allandale	Jul	Fla	1
arkansas	Jun	Calif	1
belem	Jul	Tex	1
bilthoven	Apr-Jun	Calif(2)	
	May	Mich(1)	3
binza	Mar	Tex(1)	
	May-Jun-Jul	Mass(6)	
	May	Wash(2)	
	Jun	NY-C(1)	
	Jun-Jul	Calif(3)	13
	Feb	SD	1
blegdam	Feb	SD	1
brandenburg	Jun	Ill	1
california	Jan-Feb	Pa(3)	
	Jan	Tex(1)	
	Mar-Apr	Wash(3)	
	May	Ill(1)	
	May	Okla(1)	
	May	Ga(1)	10
	Jan-May-Jun	Hai	3
colorado	Jan-May-Jun	Hai	1
corvallis	Feb	Hai	1
daytona	Mar	Tenn	1
denver	Feb	La	1
dublin	Feb-Mar-Apr	Calif	3
duesseldorf	Jan	Ohio(1)	
	Apr-Jun	La(2)	3
duisburg	Jul	Ark	1
emek	May	Tenn	1
fayed	Mar	NC	1
florida	Jan-May	Fla	2
fresno	Mar	Tenn	1
gaminara	Mar	Tex(2)	
	Apr	NY-C(1)	
	Jun	Mass(1)	
	Jun	NY-A(1)	
	Jul	Fla(3)	8
	Jul	La	1
glostrup	Jul	La	1
heilbron	Jan	Mo	1
johannesburg	Jun	Minn	1
kaapstad	Feb-Jun	Colo	2
kentucky	Jan	Calif(1)	
	Jan-Feb	Hai(2)	
	Apr-May	Pa(2)	
	Jun	Mich(1)	6
	Feb	NY-A(3)	
kottbus	Feb	Colo(1)	
	Mar	Ind(1)	5
	Feb	Calif(1)	
lexington	Feb	Calif(1)	
	Jun	Ill(1)	2

TABLE I-A - (Continued)
 SEROTYPES REPORTED FROM HUMANS PREVIOUSLY DURING 1965
 BUT NOT IN AUGUST

SEROTYPES	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
lindenburg	May	Colo	1
loma-linda	May	Ore	1
lomita	May	Ore(1)	
	Jun	Ohio(1)	2
london	May	NY-C	1
luciana	Jan	Ariz	1
madelia	Mar	Pa(1)	
	Mar	Fla(1)	2
minneapolis	Jul	Conn	1
mishmarhaemek	Feb	Calif(1)	
	May	Tex(1)	2
mission	Feb-Mar-Apr- May-Jul	Fla	7
nagoya	Jun	Tex	1
norwich	Jan-May	Ga(2)	
	Jan-Mar	Tex(2)	
	Mar-Jul	Fla(2)	
	May	NY-BI(1)	
	May	Mich(1)	
	Jul	Tenn(1)	
	Jul	Ark(1)	
	Jul	NY-A(1)	
	Jul	Va(2)	13
nottingham	May	Ark	1
ohio	Feb	Colo(1)	
	Feb	Wisc(1)	
	Jun	Calif(2)	4
paratyphi-C	Jun	Iowa	1
pensacola	Feb	Okla(1)	
	May	NC(1)	
	Jul	Ga(1)	3
pomona	Apr	Fla(1)	
	May	Calif(1)	2
remo	Mar	Va(1)	
	May	Pa(1)	2
richmond	Jul	Kan(1)	
	Jul	Fla(1)	2
siegburg	Jan	Ill(1)	
	Apr	NY-C (1)	
	Jul	Fla(2)	4
sundsvall	Jun	Calif	1
taksony	Jan	NY-BI	1
thomasville	Jan	NJ	1
virchow	Jan	Colo	1
westhampton	Feb	Mass(1)	
	Jun	La(2)	3
yalding	Jun	Tex	1
TOTAL			139

Figure 1.

REPORTED HUMAN ISOLATIONS OF SALMONELLAE IN THE UNITED STATES

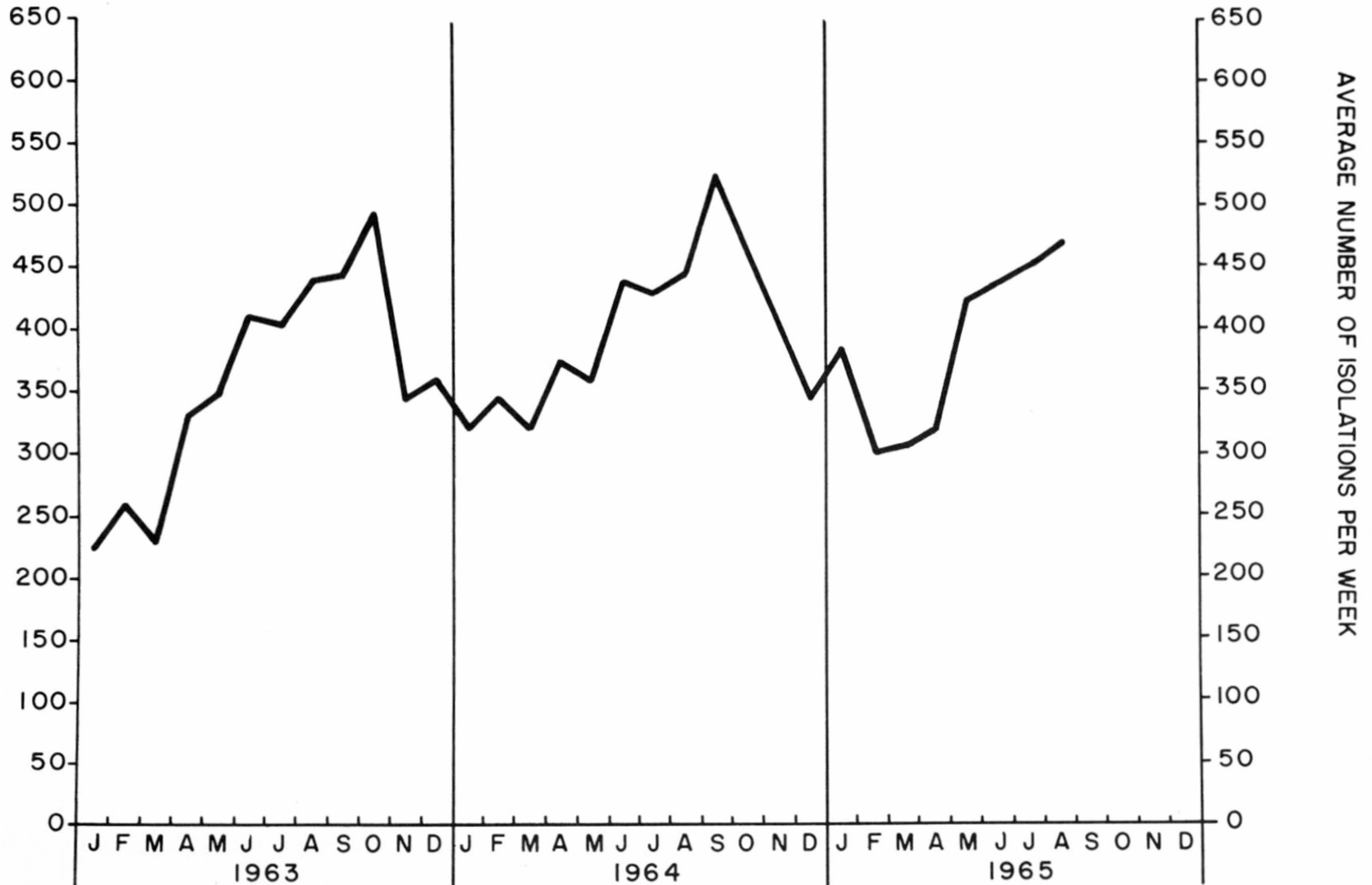


TABLE II
REPORTED ISOLATIONS OF *S. TYPHI* BY PATIENT STATUS - AUGUST 1965

STATE	REPORTED TO SALMONELLA SURVEILLANCE UNIT							CLINICAL CASES REPORTED IN MMWR		
	CASES		CARRIERS		UNKNOWN		TOTAL		August	1965 Cuml.
	August	1965 Cuml.	August	1965 Cuml.	August	1965 Cuml.	August	1965 Cuml.		
UNITED STATES	7	78	11	161	24	208	42	447	48	263
NEW ENGLAND	-	-	-	1	1	9	1	10	1	4
Maine	-	-	-	-	-	2	-	2	-	-
New Hampshire	-	-	-	-	-	-	-	-	-	-
Vermont	-	-	-	-	-	-	-	-	-	-
Massachusetts	-	-	-	-	1	3	1	3	1	3
Rhode Island	-	-	-	-	-	4	-	4	-	1
Connecticut	-	-	-	1	-	-	-	1	-	-
MIDDLE ATLANTIC	1	19	1	13	4	24	6	56	10	46
New York	1	19	-	6	1	16	2	41	7	35
New Jersey	-	-	-	-	2	6	2	6	2	4
Pennsylvania	-	-	1	7	1	2	2	9	1	7
EAST NORTH CENTRAL	2	12	1	30	2	27	5	69	3	35
Ohio	-	7	-	17	-	4	-	28	1	8
Indiana	-	-	1	12	-	6	1	18	-	8
Illinois	-	-	-	-	1	15	1	15	1	9
Michigan	-	2	-	1	1	2	1	5	1	5
Wisconsin	2	3	-	-	-	-	2	3	-	5
WEST NORTH CENTRAL	-	2	-	12	1	14	1	28	3	9
Minnesota	-	-	-	1	-	-	-	1	-	-
Iowa	-	-	-	-	-	-	-	-	1	2
Missouri	-	2	-	11	1	9	1	22	2	6
North Dakota	-	-	-	-	-	-	-	-	-	-
South Dakota	-	-	-	-	-	-	-	-	-	-
Nebraska	-	-	-	-	-	-	-	-	-	1
Kansas	-	-	-	-	-	5	-	5	-	-
SOUTH ATLANTIC	2	19	2	48	3	18	7	85	8	53
Delaware	-	-	-	-	1	2	1	2	-	4
Maryland	-	2	-	4	-	8	-	14	1	15
District of Columbia	-	-	-	-	-	-	-	-	-	-
Virginia	-	2	1	3	1	1	2	6	1	4
West Virginia	1	3	1	5	-	-	2	8	1	3
North Carolina	-	10	-	23	-	1	-	34	2	15
South Carolina	-	-	-	-	-	-	-	-	2	6
Georgia	-	-	-	1	1	4	1	5	-	2
Florida	1	2	-	12	-	2	1	16	1	4
EAST SOUTH CENTRAL	-	3	1	20	3	19	4	42	1	24
Kentucky	-	-	-	1	-	3	-	4	-	6
Tennessee	-	3	1	7	3	6	4	16	-	8
Alabama	-	-	-	-	-	-	-	-	1	6
Mississippi	-	-	-	12	-	10	-	22	-	4
WEST SOUTH CENTRAL	1	26	6	43	3	11	10	80	8	38
Arkansas	-	4	4	12	-	4	4	20	2	12
Louisiana	-	6	-	18	2	4	2	28	-	5
Oklahoma	-	1	-	3	1	2	1	6	2	4
Texas	1	15	2	10	-	1	3	26	4	17
MOUNTAIN	1	4	-	4	1	23	2	31	9	24
Montana	-	-	-	-	1	4	1	4	1	1
Idaho	-	-	-	-	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-	-	-	-	1
Colorado	-	-	-	-	-	-	-	-	-	-
New Mexico	-	3	-	4	-	17	-	24	-	9
Arizona	-	-	-	-	-	2	-	2	6	11
Utah	1	1	-	-	-	-	1	1	-	-
Nevada	-	-	-	-	-	-	-	-	2	2
PACIFIC	-	-	-	1	6	87	6	88	5	30
Washington	-	-	-	-	-	4	-	4	-	2
Oregon	-	-	-	1	2	17	2	18	1	4
California	-	-	-	-	4	65	4	65	4	23
Alaska	-	-	-	-	-	-	-	-	-	-
Hawaii	-	-	-	-	-	1	-	1	-	1
Virgin Islands	-	-	-	-	-	-	-	-	*	*

*Does not report

TABLE III

Infrequent Serotypes

<u>Serotype</u>	<u>Center</u>	<u>August</u>	<u>1965*</u>	<u>Total 1963 & 1964**</u>	<u>Comment</u>
<u>S. albany</u>	VA	1	4	9	First isolated in Albany, GA.
<u>S. atlanta</u>	GA	2	5	16	All isolates thus far reported to this unit have been from GA.
<u>S. bovis-morbificans</u>	HAI	15	28	11	See report from HAI in this month's issue.
<u>S. butantan</u>	MICH	1	1	0	Probably acquired in India during a round-the-world tour; first time reported to this unit.
<u>S. carrau</u>	FLA	2	3	4	First isolated in Uruguay from the mesenteric lymph glands of swine.
<u>S. cerro</u>	FLA	1	7	15	A common nonhuman isolate from multiple sources
<u>S. eastborne</u>	CALIF	1	3	2	Very uncommon; only one nonhuman isolate reported to this unit from a chicken in ARIZ.
<u>S. essen</u>	MASS	1	3	6	This case may be related to chicken.
<u>S. guinea</u>	ILL	1	1	0	Isolated from an 8-year-old male recently returned from the Ivory Coast in Africa.
<u>S. hartford</u>	MICH	1	16	27	Has been reported to this unit only 4 times from nonhuman sources since 1962.
<u>S. inverness</u>	ARIZ	1	4	4	Nonhuman sources have been dogs and cold-blooded vertebrates.
<u>S. irumu</u>	MO	1	5	83	Cause of a current small outbreak in MO.
<u>S. leeuwarden</u>	TEX	1	2	0	Second isolate from TEX this year.

Table III (con'td)

<u>Serotypes</u>	<u>Center</u>	<u>August</u>	<u>1965*</u>	<u>Total 1963 & 1964</u>	<u>Comment</u>
<u>S. minnesota</u>	TEX	1	8	26	Not uncommonly isolated from poultry.
<u>S. muenster</u>	MASS	3	6	12	Has been isolated from coconut, eggs, poultry, swine and horses.
<u>S. new-brunswick</u>	CALIF	1	6	10	Seventeen isolations made from flies in ILL during 1962.
<u>S. oslo</u>	MICH	1	13	14	See SSR #40 for report of isolations from marmoset monkeys.
<u>S. paratyphi A</u>	DEL	1	9	15	Isolated from a 19-year-old student nurse.
<u>S. rubislaw</u>	LA	1	3	29	Caused an outbreak of enteritis in a zoo colony of Jew lizards in Australia. Frequent isolate from turtles in U.S.
<u>S. simsbury</u>	NY-BI	1	1	12	One of the serotypes involved in the interstate outbreak associated with a dietary supplement during 1964.
<u>S. stanley</u>	NY-A	1	6	22	Fairly common in European countries. Frequently isolated from monkeys imported into U.S.
<u>S. tamale</u>	FLA	1	1	1	The 1963-1964 isolate also from FLA.

*Represents 13,346 human isolations during the first 8 months of 1965.

**Represents 39,762 human isolations of salmonellae during 1963 and 1964.

TABLE IV

Age and Sex Distribution of 1, 839 Isolations of Salmonellae
Reported for August 1965

<u>Age</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Percent</u>	<u>Cumulative Percent</u>
Under 1 year	99	111	210	17.3	17.3
1-4 yrs.	165	134	299	24.6	41.9
5-9 yrs.	94	58	152	12.5	54.4
10-19 yrs.	91	52	143	11.8	66.2
20-29 yrs.	33	66	99	8.2	74.4
30-39 yrs.	37	39	76	6.3	80.7
40-49 yrs.	25	48	73	6.0	86.7
50-59 yrs.	34	32	66	5.4	92.1
60-69 yrs.	24	29	53	4.4	96.5
70-79 yrs.	16	18	34	2.8	99.3
80 + year	3	6	9	0.7	100.0
Unknown	<u>301</u>	<u>324</u>	<u>625</u>	—	—
Total	922	917	1,839		
Percent of Total	50.1	49.9			

TABLE VI-A
 SEROTYPES REPORTED FROM NONHUMAN SOURCES
 PREVIOUSLY DURING 1965 BUT NOT IN AUGUST

SEROTYPES	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
braendenbrug	Jan	NC	1
cambridge	Apr	Ind	1
carrau	Jul	Conn	1
duesseldorf	Apr	Mass(1)	
	Jun	Me(1)	2
florida	Jan	Ill	1
gatow	Jul	Pa	1
goerlitz	Jan	Wash	1
grumpensis	Jul	Miss	1
hartford	Apr	Minn	1
illinois	Mar-Jul	Minn(2)	
	May	Md(1)	
	Jul	Ind(2)	5
inverness	Jun	Calif	1
javiana	Jan	Fla(1)	
	Mar	Calif(1)	
	Jun-Jul	Tex(4)	
	Jul	Pa(1)	7
lexington	Jan	Tenn(1)	
	Jun	Conn(1)	
	Jul	Ind(2)	4
lindenburg	Jun	La	1
menston	Mar	Va(1)	
	Apr-Jun	Wash(2)	3
miami	Feb	Minn(1)	
	Feb	Mo(1)	
	Apr	Mich(1)	
	Jun-Jul	Fla(2)	
	Jul	Ny-A(1)	6
mikawashima	Mar	Ind	1
mission	Jan	Ark(1)	
	Jan	SC(1)	
	Jul	Miss(1)	3
norwich	Feb	NC	1
ohio	Jul	Ind	5
orion	Jan	Miss(1)	
	Jan	Mont(1)	
	Mar	Minn(2)	4
oslo	Mar-Apr	Ill(4)	
	Jun	Calif(6)	10
siegburg	May	Mich(1)	
	Jul	Ark(1)	
	Jul	Mo(4)	6
simsbury	Jul	Ark(1)	
	Jul	Fla(2)	
	Jul	Iowa(1)	4
tallahassee	Jan	Fla	1
typhi-suis	Feb	Calif	1
urbana	Mar	Fla(2)	
	May	Conn(1)	
	Jun	NY-A(1)	
	Jul	Wisc(1)	5
westerstede	Jan	Miss	2
westhampton	Feb	Mass(1)	
	Jun	La(1)	
	Jul	SC(1)	3
TOTAL			83