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MARCH 27, 1965

COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

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For the Month of February 1965

U. S. Department of Health, Education, and Welfare / Public Health Service

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	Dr. James L. Goddard, Chief
Epidemiology Branch	Dr. Alexander D. Langmuir, Chief
Investigations Section	Dr. Philip S. Brachman, Chief
Salmonella Surveillance Unit	Dr. Charles E. McCall, Chief
	Dr. Richard N. Collins
	Dr. Read F. McGehee
	Mr. James B. Goldsby, Statistician
Veterinary Public Health Section	Dr. James H. Steele, Chief
Veterinary Public Health Laboratory	Mrs. Mildred M. Galton, Chief
	Dr. Kenneth D. Quist
	Dr. John R. Boring

Collaborators

Laboratory Branch	Dr. U. Pentti Kokko, Chief
Bacteriology Section	Dr. Philip R. Edwards, Chief
Enteric Bacteriology Unit	Dr. William H. Ewing, Chief

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See Attached - Centers Contributing To This Report

I. SUMMARY

During February, 1,198 human isolations of salmonellae were reported. The average number of isolations per week, 300, was a decrease of 85 from January 1965 and 45 from the figure for February 1964. In view of the trend over the last 2 years portrayed by Figure 1, the decrease this month was unexpected. The number of recoveries reported this month was the lowest since March 1963. The reasons for this unprecedented drop are not apparent.

A total of 407 nonhuman isolations were reported during February for a decrease of 131 from January, but an increase of 37 over the February 1964 figure.

Salmonella cubana Alert

There has been an abrupt rise in the number of S. cubana isolations reported to the Salmonella Surveillance Unit. Whereas S. cubana usually accounts for between 1 and 3 isolations per week, or about 0.2 per cent of the total number of isolations, during the last week in February and the first two weeks in March the number has increased significantly. During this three-week period of time, 21 isolations of S. cubana have been reported representing 2.2 per cent of the total number of isolations reported. The striking pattern noted is that all but 3 of the 13 whose ages are known are less than 4 years old. No geographical preponderance has been noted. The States from which the isolations were reported and the number reported are as follows: New York, 4; Massachusetts, 4; Maryland, 3; Texas, 3; Virginia, 2; Wisconsin, 2; California, 1; Illinois, 1; Michigan, 1. The States from whom the isolations were submitted have been notified of the potential interstate outbreak, and epidemiologic information has been requested. The Salmonella Surveillance Unit urges that all cases of S. cubana infection be investigated and the information submitted to the Salmonella Surveillance Unit.

Erratum: Wow! Not a cow! In SSR No. 34, page 18-19, Outbreak of S. brandenburg Related to Pet Turtles, the isolation is stated as being recovered from a cow, whereby the article describes a human outbreak. We assure you the error in species identification was made by the "electricks" typewriter and in no way reflects such confusion on the part of the investigators. We cower from our error, and that's no bull. Wow!

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

A total of 1,198 human isolations of salmonellae were reported during February. The average number of isolations per week was 300, which was a decrease of 85 from the previous month and a decrease of 45 from February last year.

The seven most commonly reported serotypes from humans during February were:

Rank	Serotype	Number	Per Cent	Rank Last Month
1	S. typhi-murium & S. typhi-murium var. copenhagen	360	30.0	1
2	S. infantis	93	7.8	4
3	S. heidelberg	89	7.4	2
4	S. enteritidis	75	6.3	3
5	S. typhi	68	5.7	5
6	S. newport	58	4.8	7
7	S. saint-paul	50	4.2	5
	Total	793	66.2	
	Total salmonellae isolated (February)	1,198		

While accounting for 66.2 per cent of the isolations reported during February, the seven most frequently reported serotypes represented only 11.9 per cent of the 59 different serotypes reported. This is consistent with past experience.

The percentage of S. derby isolations decreased once again and has reached its lowest point (3.3 per cent of total isolations) since the beginning of the S. derby outbreak in March 1963.

Salmonella typhi increased from 4.7 per cent of reported recoveries of salmonellae in January to 5.7 per cent this month. While this increase is notable, it may be misleading since the absolute number of isolations decreased from 72 to 68. A summary of the S. typhi recoveries appears in Table II.

The family case to total case ratio during February (.194) is consistent with past experience as is the age-sex distribution (Table IV).

B. Nonhuman

There were 407 isolations of salmonellae from nonhuman sources reported in February. This is a decrease of 127 from the previous month. There were 44 serotypes identified among those submitted from 32 States.

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

Rank	Serotype	Number	Per Cent	Rank Last Month
1	S. typhi-murium & S. typhi-murium var. copenhagen	81	19.9	1
2	S. heidelberg	59	14.5	2
3	S. pullorum	29	7.1	4
4	S. blockley	25	6.1	7
5	S. saint-paul	18	4.4	Not Listed
6	S. anatum	15	3.7	Not Listed
7	S. oranienburg	13	3.2	Not Listed
		240	58.9	

These seven types accounted for 58.9 per cent of the total.

The four species from which most of the isolations were obtained in order of frequency are: turkeys, 99 (24.3 per cent); chickens, 93 (22.8 per cent); poultry products, unknown, 88 (21.3 per cent); and bovine, 28 (6.8 per cent).

Of interest this month is the eight Salmonella alachua isolations. Seven of the eight are from egg products. While reported previously from chickens and turkeys, these are the first egg product isolates of this serotype.

Two rare nonhuman isolates this month were Salmonella westhampton from Massachusetts and Salmonella typhi-suis from California. The S. westhampton isolate provided a lead to a possible association of the human S. westhampton isolate this month from Massachusetts with frozen whole eggs. S. typhi-suis has been reported ten times during 1963-64 from swine in the states of California, Massachusetts, Texas, and Wisconsin. This serotype is host-adapted to swine, and appears only rarely from other sources.

III. CURRENT INVESTIGATIONS

None.

IV. REPORTS FROM STATES

A. (1) Colorado

Mycotic Aneurysm Due to Salmonella irumu. Reported by C.S. Mollohan, M.D., Chief of Epidemiology, and Michael Cross, M.D., EIS Officer, Colorado State Department of Health.

A 64-year-old male diabetic was admitted to a Colorado Hospital with hemoptysis. The only positive physical finding on admission was a non-tender right supraclavicular mass, which was further delineated on chest X-ray as a right mediastinal mass extending into the right supraclavicular region. A biopsy of the mass revealed an infected hematoma which had probably developed secondary to a leaking right subclavian aneurysm. Salmonella irumu was isolated from a culture of the fluid obtained from the hematoma. Neither the patient nor his family had a past history suggesting salmonellosis. One month after admission the aneurysm eroded into the patient's esophagus and he died.

Editor's Comment: It is impossible to say whether this represents a primary or secondary mycotic aneurysm. However, it is uncommon for a primary mycotic aneurysm to occur in the ascending aorta or subclavian artery.

Salmonella irumu, although not a rare serotype, is an uncommon one. It has been reported 86 times to the Salmonella Surveillance Unit. Sixty-nine of these cases were associated with a large outbreak of gastroenteritis in North Carolina. Nine of the remaining seventeen isolates were reported from Colorado (Rio Blanco and Denver Counties). Other states reporting S. irumu isolates include Missouri and Florida. Nonhuman isolates of Salmonella irumu have been reported primarily from eggs and turkeys.

(2) Colorado

Salmonella san diego Gastroenteritis Following a Banquet. Reported by C.S. Mollohan, M.D., Director of Epidemiology, and Michael Cross, M.D., EIS Officer, Colorado State Department of Health.

On December 10, 1964, approximately 1,000 people attended an annual Christmas dinner at which time a menu of turkey and dressing, potatoes, gravy, green beans, cranberries, and pumpkin pie was served. Within 24 hours following the meal a proportion of the people attending the banquet became ill with chills, fever, abdominal cramps, headache, vomiting, and diarrhea. Ten persons were hospitalized, but no deaths occurred. Stool cultures were obtained from 46 persons who attended the dinner and 29 of these were positive for Salmonella san diego. Although no exact case count was obtained, it was estimated that approximately 850 of the 1,000 persons attending the banquet became ill.

Food histories were obtained from 72 persons who were present at the dinner and the results of these questionnaires suggested turkey as the vehicle of infection. None of the roast turkey was available for culture.

Of nine people working in the kitchen, only five were associated with handling and serving food. One of these, the chef, had experienced gastroenteritis 5 days prior to the banquet. None of the other kitchen employees had had a recent illness. All kitchen workers except for the chef consumed the turkey dinner and four of these became ill. Salmonella san diego was isolated from all eight kitchen workers who submitted a stool culture, including the chef who did not eat a turkey dinner.

Twelve 35-pound turkeys had been served at the banquet. These turkeys were removed from the freezer 3 days prior to the banquet and placed under running water to thaw. The following morning they were delivered and removed from their packages, at which time the interiors of the birds were still frozen. Nevertheless, the birds were then cooked for 7 to 8 hours, an insufficient length of time based on the need for 15 to 20 minutes cooking per pound of meat. After cooking, the birds remained at room temperature until they were served the following evening. The turkeys were sliced as needed during the banquet. As the deeper meat was reached, it was apparent to the chef that these areas were not thoroughly cooked and the partially carved birds were then placed back in the ovens for an unknown period of time. The recooking procedure was not totally effective since some who were interviewed revealed that their portions were under-cooked.

The high estimated attack rate suggested that most of the sliced turkey was contaminated. Spread of the organisms from a contaminated knife blade or from the contaminated hands of the chef seemed unlikely because of the number of birds involved and the absence of an incubation period following slicing and handling. The investigators concluded that several turkeys were probably endogenously contaminated and the insufficient cooking and the time available for incubation allowed for multiplication of the organism. This resulted in a large inoculum and thus, a high attack rate.

Editor's Comment: This outbreak clearly demonstrates a number of problems in the preparation of turkeys particularly for large banquets. The Veterinary Public Health Laboratory is presently conducting an investigation to determine the anatomical sites most heavily contaminated in an endogenously contaminated bird, the effects of insufficient cooking on these different anatomical sites, and the degree of dissemination of organisms during cooking. Salmonella san diego was isolated from 1 bird from the same lot cultured in the Veterinary Public Health Laboratory.

B. Massachusetts

Infection by Multiple Serotypes With the Use of One as an Epidemiological Tracer. Reported by R. A. MacCready, M.D., Director, Diagnostic Laboratory, and Arthur N. Wilder, D.V.M., EIS Officer, Massachusetts Department of Public Health.

Salmonella tennessee, S. westhampton, and S. enteritidis were isolated from a 13-year-old male with gastroenteritis. Investigation revealed the onset of symptoms some 12 hours following consumption of a meal consisting of roast beef, baked potato, carrots, cola, and Boston cream pie. All items of this family meal were prepared at home except for the Boston cream pie which was bought frozen and prepared by a large commercial firm. All members of the family had consumed the entire meal except for the father who ate only a small portion of the pie. The mother also became ill with abdominal pain 15 hours after eating. The father complained of no gastrointestinal symptomatology. Specimens submitted by the parents were negative for enteric pathogens.

The pie was purchased 1 day prior to its use in a frozen state and was not refrigerated before consumption.

Because of the rarity of S. westhampton, Massachusetts records were checked and it was found that in October 1964 this serotype had been isolated as a part of a food survey program from a lot of frozen whole eggs. The firm marketing the pie in question was then contacted and admitted using frozen whole eggs in the pie's preparation and had surprisingly purchased all of the frozen eggs from the same dealer whose frozen egg products had been found positive for S. westhampton previously.

In inquiring into the making of the Bostom cream pie, the investigators determined that the filling of the pie was synthetic and contained no egg products, but that the cake portion was made with the frozen whole eggs.

Editor's Comment: The value of this investigation is apparent but should be re-emphasized. Salmonella westhampton is an extremely rare serotype and was isolated only once during the 28,000 isolations by the CDC Enteric Bacteriology Laboratory between 1947 and 1958. In the experience of the Salmonella Surveillance Unit it has been reported from human sources only twice, once in Florida in 1963 and once in Hawaii in 1964. The three nonhuman isolates reported came from a dog, from meat scraps, and from poultry feed.

This investigation clearly demonstrates the use of the rare serotype as an epidemiologic tracer, and also emphasizes the importance of a food survey program which delineates the salmonella serotypes found in certain commonly contaminated foods. This investigation links two unrelated sources of information into a logical event.

C. Minnesota

Death Associated with Salmonella thompson Infection. Reported by D.S. Fleming, M.D., Director, Disease Prevention and Control, and Leslie P. Williams, D.V.M., EIS Officer, Minnesota Department of Health.

A 92-year-old female expired 3 days after entering a hospital with diarrhea, vomiting, a temperature of 102° F. and dehydration of several days duration. Intravenous fluids and antibiotics resulted in only transient improvement. A blood culture grew E. coli and a stool culture was positive for S. thompson.

Inquiry into the nursing home from which she came revealed that she was the only patient who suffered such an illness. Shortly prior to the illness she and five other residents of the nursing home were started on an 1800 calorie-a-day (formula) feeding that contained milk, pureed meat, vegetables, cream of wheat, salad oil, corn syrup, salt, and 1½ raw eggs. The eggs were grade A and purchased under State contract.

The five other residents receiving the formula were cultured and one, a 73-year-old female was found to be excreting S. thompson. She had had no contact with the deceased except through the nursing staff.

The investigators suggested that the feeding formula was the vehicle of infection and that probably the raw eggs incorporated were the source of S. thompson. As a control measure, all eggs used in the formula were to be hard boiled and then pureed.

Editor's Comment: Although a lack of certainty exists, the authors are certainly justified in concluding that the raw eggs used in the formula feeding were the likely source of the infection. Although she may have expired directly as a result of E. coli septicemia, S. thompson infection was certainly an important event as indicated by her symptoms on admission.

SPECIAL REPORTS

A. Proposed Amendments to USDA Regulations on Grading and Inspection of Egg Products.

The proposed amendments were published in the Federal Register, Tuesday, March 16, 1965. A summary of the proposed requirements for plants operating under USDA voluntary inspection program appeared in Weekly Letter of the Institute of American Poultry Industries, March 17, 1965 and is reproduced below.

"By June 1, 1965 -- All egg products except whites must be pasteurized if the plant has the facilities to do it. If the plant does not have the facilities, the product must be tested for salmonella. If the test is positive, the product must be pasteurized.

"This means liquid or frozen whites must be pasteurized....or tested for salmonella....or heat-treated and tested for salmonella. Dried whites must be heat-treated and tested for salmonella unless the liquid has been pasteurized.

"By January 1, 1966 -- All egg products except whites must be pasteurized.

"By June 1, 1966 -- All egg products including whites must be pasteurized."

It should be noted that the new amendments are the result of a series of meetings arranged by the Institute to help clarify the situation for egg products processors.

The following information regarding a method for treating egg whites to eliminate salmonellae also appeared in the Weekly Letter of the IAPI, March 17, 1965:

"Armour and Company has announced it will license other processors of egg products to use its patented method for treating egg whites to eliminate salmonellae. This method (covered by U.S. Patent No. 2,776,214) employs a combination of low heat treatment with small amounts of hydrogen peroxide, which Armour says destroys salmonella organisms and drastically reduces the number of other bacteria. Armour developed the method in its research laboratories and obtained a patent in 1957. They expect to offer licensees some technical assistance. Anyone interested should contact Lloyd Woodall, President of Armour Dairy, Poultry and Margarine Company, Chicago."

B. Rendering Plant Visit:

The following account provided by one of our collaborators in the study of salmonella problems is a good example of the current conditions that exist in far too many rendering plants throughout the country.

"1. This rendering company converts chicken offal, feathers, meat offal and bones into their respective meals for use as feed protein sources. The plant produces 125 to 150 tons of finished protein meals per day and operates 24 hours per day, six days a week. The plant manager was aware of the salmonella problem and stated that they had sent 2 to 3 samples a month to a laboratory for microbiological examination and that salmonellae were found frequently. However, invariably, material from the plant is delivered to the customer within 72 hours of manufacture before the results of these examinations are received. The plant manager was of the opinion that the number of salmonellae in finished meals could be reduced. It would not be possible, however, to produce salmonella-free protein concentrate nor even a coliform-free product because they rendered the intestinal contents of animals.

He indicated that cross contamination and the uniformed and usually uninterested workers further complicated attempts to clean up the product. Air sampling studies had been made in the plant and aerosol spread of salmonella demonstrated.

"2. It is difficult to imagine that this company was ever designed as a rendering plant. It gave the impression of having just grown like "Topsy." Certainly, little thought was given to flow of materials, physical separation of "green" and finished product areas, and none whatsoever to cleanability.

"3. The main cookers are batch loaded from above by hand. Some material is shoveled in, forked in, pulled in with a baling hook or occasionally thown in by hand. After chopping off the legs of a cow carcass, the whole carcass was manhandled into the cooker by three men. No stringent effort was made to separate feathers, chicken offal, meat offal or bones. The floor was very slippery and wet with blood, fat, and body fluids. The workmen soon became extremely soiled. The receiving area and loading area were filled and piled with animal debris not only in the receiving area, bins, and conveyors, but everywhere including the truck yard and even on the stairs by which one mounts to the loading floor. Feathers were blown around like snow.

"4. The loading floor is directly above the room where the cooked product is discharged from the digestors. The separation of these two areas is not real, a fact which was attested to by the putrefying animal tissues hanging down from the ceiling of the digestor room around the loading port above. Similarly, pieces of "green" offal were found on the floor of the digestor room and festooning various parts of the machinery. These "green" materials occasionally fall or are thrown in with the finished (cooked) materials.

"5. All of the digestors are used indiscriminately for chicken offal, feathers, meat and bone meal on an availability basis. No one individual seemed to be specifically responsible for the digestion operation. There is no process control and no fixed time for processing any type of product. The writer was assured that it was impossible to fix a definite processing time because the processing time depended not merely on the nature of the material, feathers, chicken offal, meat offal or bone meal, but the physical nature and state (or composition) of a particular digestor charge and the weather or atmospheric conditions. Since each batch starts cold, they do not time it from the time it gets up to cooking temperature but rather from the time heat is first applied. Pressure cooking is not used because the packing glands around the digestor agitator shaft leak under pressure and would contaminate the previously cooked product below. The plant manager said that maintenance-wise it was impossible to keep the gland tight enough to prevent leakage of raw fluids out of the digestor when under pressure. The materials are cooked from two to five hours at 160° F. to 180° F. Note is made of the starting time (cold) and beginning at three hours, the digestor is opened at intervals to determine the degree of digestion by squeezing some of the cooked material by hand. Feathers are digested with lime.

"6. No attempt is made between batches to clear or clean the hoppers into which the cooked material is dumped. Likewise, all cooked material passes through a common system of screw conveyors. The floor is cracked, broken, and irregular. A considerable amount of dirty water which had backed up from plugged sewer floor drains was standing around on the floor. The floor was heavily coated with lime which is used because of its known germicidal activity. Since the lime covers a layer of organic material from one to four inches thick, its germicidal activity is probably not significant.

"7. Feather meal goes to a drier and then to a finished stock pile. All other materials pass through steam presses which remove most of the fat. The fat goes to storage tanks for sale to feed processors. The solids go to mills for grinding and then to the finished meal storage areas. With the sole exception of the bins where the finished meal is stored, none of the rest of the plant gives evidence of even token sanitary care. It is doubtful that there has ever been a real clean-up in the plant. At most, the dispirited employees occasionally try to shovel away the top of material. Even this is difficult because of the uneven floor and many crevasses where dirt can accumulate.

"8. During the tour, the writer pointed out a large amount of intact feathers on a pile of finished feather meal and observed that something was wrong since intact feathers could not survive the digestion procedure. The plant manager said that these were just air-borne contaminants. Later in the day, he informed the writer that an inexperienced employee had dumped an incompletely digested and cooked batch of feathers on the finished pile. A workman was brought in to skim off the uncooked material and return it to the digestors for further treatment.

"9. Blood and putrefying scraps of animal materials and even dead animals litter the grounds and areas. The ground is covered with a thick gum composed of mud, blood, tissue fluids, and decaying organic material. Workmen pass freely among all of the areas of the plant and do all jobs. No one has the specific job of cleaning up and it seems that it is done when anyone has some spare time.

"10. Finished protein meals are hauled to the customer in the same trucks that haul the raw materials to the plant. According to the plant manager, the trucks are thoroughly cleaned and sanitized before hauling finished products. The writer observed this cleaning procedure. A worker who had been charging the digestors climbed into the truck, sprinkled a cleaner-sanitizer on the bed and sprayed the entire body with cold water and scrubbed it with a broom. He then jumped to the contaminated ground to get the hose and climbed back into the truck to rinse the interior. The truck was moved to another location where the worker again climbed into the truck and gave it a perfunctory steaming. It was learned that the cold water used to wash the truck and in the plant, came from the last of a series of lagoons into which a creek and the plant sewage drain. Obviously, recontamination of protein concentrates may occur in the trucks that haul finished protein meals.

"11. In the writer's opinion, the reinstitution of pressure cooking is essential. Likewise, process controls that require a fixed time at a given temperature are mandatory. Once a sterile cooked product has been achieved, the problem of recontamination can be attacked.

"12. It would probably be a good idea to make microbiological examinations of the fat supplied by this rendering company since it obviously undergoes no greater heat treatment than the rest of the materials and may even serve as a collecting agent for microbes.

Summary

"This rendering company needs some serious and drastic improvements to produce even reasonably sanitary and wholesome protein concentrates, let alone salmonella-free ones. Pressure cooking of green protein sources is not done. This procedure should be reinstated and carried out for a fixed time and temperature. Leakage of packing glands around the digestor agitators can be treated with drip pans to prevent contamination of sterile cooked materials. There is no control of the cooking or digestion process and it is possible to accidentally dump green incompletely cooked product into finished protein concentrates. Green and finished products are in close proximity and there is no real separation. Even if sterility is achieved in the digestion process, there is a severe aerosol contamination problem. Plant clean-up and sanitation are negligible. Cross-contamination occurs everywhere. Vehicles, equipment, and men pass through all areas of the plant. Putrefying organic materials are littered everywhere in the plant area. Personal sanitation of the employees is very poor. The same trucks haul raw and finished product with only a token clean-up before hauling the finished product. This rendering company is a potentially active, serious source of salmonella organisms in protein concentrates used in poultry feeds. No real progress in eliminating salmonella infections will be made until this and similar plants are cleaned up."

INTERNATIONAL

Salmonella Isolations Typed During the Fourth Quarter of 1964, Utrecht, The Netherlands. Reported by E.H. Kampelmacher, D.V.M., Head, Zoonoses Laboratory, National Institutes of Health, The Netherlands.

During the fourth quarter of 1964, 2,904 isolations of salmonellae were typed in the Zoonoses Laboratory of the National Institute of Health in the Netherlands. This figure represented a decrease of 1,418 (32.8 per cent) from the previous quarter, making the third quarter the period of highest incidence during the year. The peak incidence in the United States during 1964 was also during the third quarter of the year.

Of the 2,904 recoveries made during the fourth quarter, 1,776 (61.2 per cent) were from human specimens. The seven most frequently isolated serotypes from human and nonhuman sources appear in Table VIII. Salmonella typhi-murium and typhi-murium var. copenhagen, S. panama and S. stanley were the only types

which appeared among the seven most common from both human and nonhuman sources. As was true last quarter, S. dublin, the second most common nonhuman isolate, was recovered predominately from cattle. Only eight were isolated from human specimens. The majority of S. bareilly recoveries this quarter were from chickens. All of the nonhuman isolations of S. panama were from meat and meat products, sewage and surface water, pigs and slaughterhouses and scrapings.

The most prominent nonhuman sources of salmonellae during the fourth quarter of 1964 were chickens, 262 (23.2 per cent), cattle 193 (17.1 per cent), pigs 170 (15.1 per cent) and sewage and surface water 126 (11.2 per cent).

FOOD AND FEED SURVEILLANCE

A. Preliminary Report of Investigation of Salmonellae in Turkey Products. Contributed by Frank L. Bryan, Doctorate Student, Food Processing Laboratory, Iowa State University, Ames, Iowa (on study leave from CDC, Training Branch).

Intensive studies are being conducted in two processing plants which produce "further-processed" turkey products to determine the prevalence of salmonellae in birds on arrival at the plants, and the contamination of the plant environment, the hands of workers, and the finished product. Feed samples from the turkey farms are also being examined.

Preliminary findings have demonstrated that salmonellae were present in the turkey feed, in the birds when they reach the processing plant, on dressed birds and widely distributed in the environment of the processing room.

Salmonella san diego, S. anatum, S. cerro, S. saint-paul, and S. montevideo have been the serotypes most frequently isolated, although 19 other serotypes have been identified. Usually, one serotype was found predominant during a single plant survey. A total of 24 S. cerro serotypes were isolated on two occasions from each plant and twice from feeds. This serotype was not reported from turkeys between 1957 and July 1961. Most of the current isolations of this serotype have been reported from feeds.

B. Results of Examination of Materials from a Cotton Seed Protein Processing Plant and from Cotton Gins.

The finding of salmonellae in cotton seed protein concentrate used in a food supplement for patients in mental institutions (SSR No. 34, pp. 3-10) led to the examination of samples of cotton seed from the processing plant and from cotton gins in surrounding areas. Results of these studies are shown below:

Source	Type of Sample	SAMPLES No.	Positive	Per Cent	Serotype
Cotton seed protein processing plant	Finished cotton seed protein	8	3	37.5	S. simsbury (1) S. tennessee (2)
	Raw cotton seed	28	5	17.9	S. tennessee (3) S. senftenberg (1) S. simsbury (1)
		42	1	2.4	S. newport
		100	2	2.0	S. typhi-murium (1) S. cubana (1)
		178	11	6.0	
Cotton gins	Cotton seed and samples from environment of gin and seed houses	59	4	6.8	S. newport (2) S. anatum (1) S. tennessee (1)

The serotypes isolated from both raw cotton seed and the finished product were among the same types recovered from the food supplement and from patients eating this product. Isolations from material cultured from the gin included 1 culture of S. newport from 3 samples of waste inside the building and another of this type from 1 of 7 samples of seed from the ground near the loading chute. In addition, Arizona organisms were isolated from 1 sample from each of these sources. Arizona organisms were also recovered from 1 sample of raw cotton seed from the processing plant. Salmonellae were recovered from 2 of 12 samples of cotton seed from a seed house. These types were S. tennessee and S. anatum.

The remaining 33 samples included cotton seed from rollers in gin; cotton balls from trailer; waste in trailer; and cotton seed and waste (some mixed with bird droppings) from ground outside the gins. No salmonellae were recovered from these samples.

Figure I.

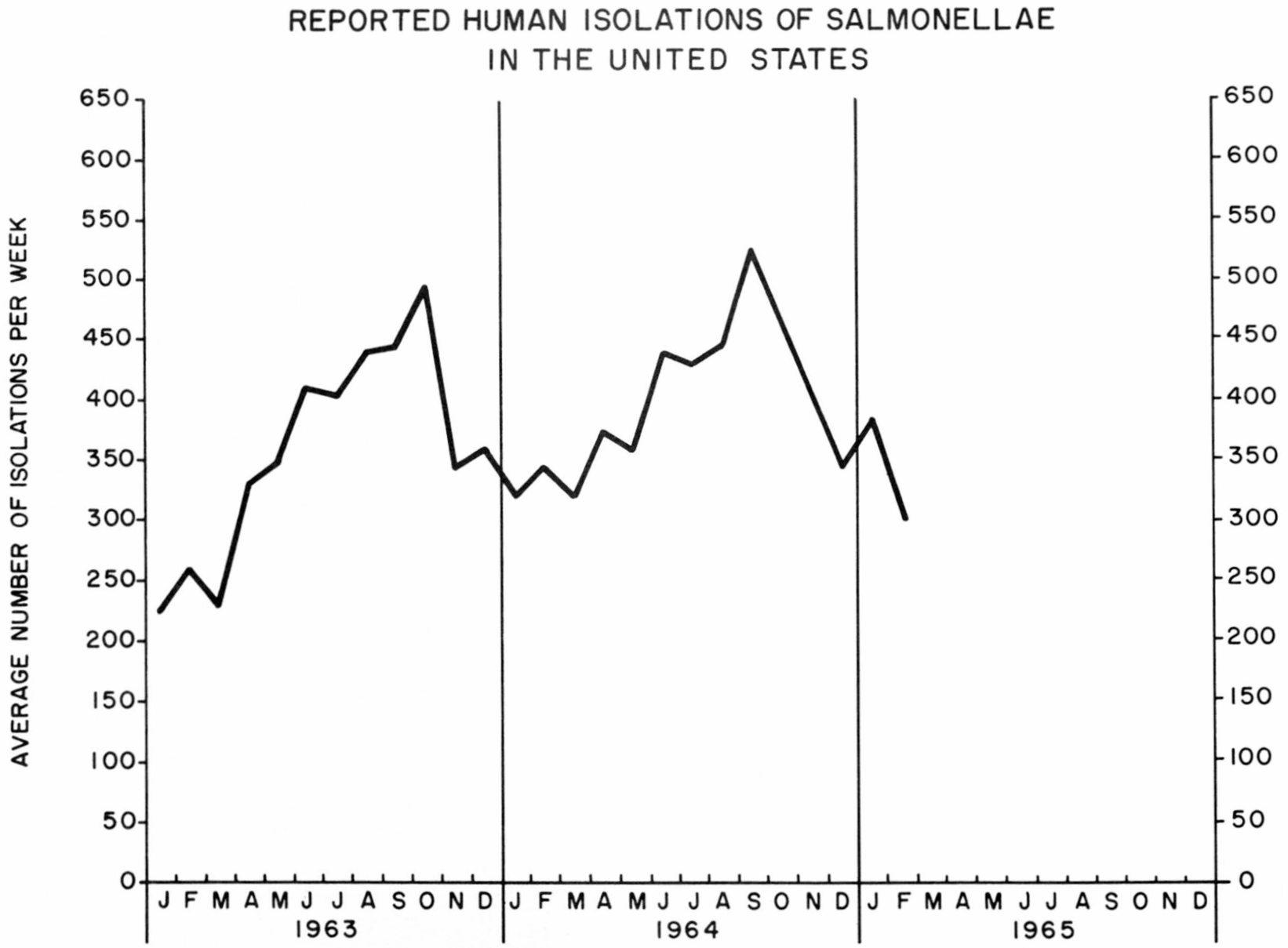
REPORTED HUMAN ISOLATIONS OF SALMONELLAE
IN THE UNITED STATES
AVERAGE NUMBER OF ISOLATIONS PER WEEK
650
600
550
500
450
400
350
300
250
200
150
100
50
0
J F M A M J J A S O N D
1963
1964
1965

TABLE I

SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING FEBRUARY, 1965

SEROTYPE	REGION AND REPORTING CENTER																		
	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL					
	MAINE	NH	VT	MASS	RI	CONN	TOTAL	NY-A	NY-B[*]	NY-C	NJ	PA	TOTAL	OHIO	IND	ILL	MICH	WIS	TOTAL
albany						1	1									1			1
anatum						1	1			1			1	2					2
bareilly																			
berta																			
blegdam																			
blockley				1			1	5	1	1	1	1	9			1			1
braenderup											1		1						
bredeney					1		1							1					1
california												2	2						
chester						2	2									1			1
cholerae-suis v kun																2			2
corvallis																			
cubana								2					2				3	1	4
denver																			
derby	1			5		3	9	3	2	1	1	4	11	1		3	2	1	7
dublin																			
enteritidis		1		3		1	5	8	1	3	4	7	23	4	1	16	1	1	23
essen																			
give				1			1		1			3	4						
heidelberg		1		5		3	9	2		2	4	5	13	2	1	7	10	1	21
indiana																	1		1
infantis		2		1			3	3		3	3	12	21	9	1	7	2	5	24
irumu																			
java								2					2			1			1
javiana																2			2
kaapstad																			
kentucky																			
kottbus								3					3						
lexington																			
litchfield														1		1			2
livingstone								1					1						
manhattan																			
miami																			
mishmar-haemek																			
mission																			
mississippi																2			2
montevideo		1		1	1		3	1		2	1	1	5	2		3	2	3	10
muenchen											2	3	5						
newington																2			2
newport				3	1		4	1	2	1		1	5	2	1	1	1		5
ohio						1	1											1	1
oranienburg								1	1		1	2	5	4	1	1	1	4	11
panama												1	1		1	1		3	5
paratyphi B				1			1		1	1		1	3	1		3	6		10
pensacola																			
poona																1			1
reading								1					1						
saint-paul								1	1	3		3	8	3		1	3	2	9
san-diego						1	1			2			2	1					1
schwarzengrund																1			1
senftenberg								1					1			1			1
tennessee											1	1	2				1		1
thompson				1			1	1	4				5	1		1	1	1	4
typhi				1			1	2	2	1		2	7	4	2		1		7
typhi-murium			2	21	5	14	42	12	1	15	13	14	55	15	4	17	14	2	52
typhi-murium v cop				3			3				8		8				2		2
weltevreden																			
westhampton				1			1												
worthington																	1		1
Untypable group B								1			1		2						
Untypable group C-1								2					2						
Untypable group C-2																			
Untypable group O																			
unknown																1		3	4
TOTAL	1	5	2	48	8	27	91	53	17	36	41	63	210	53	12	78	52	28	223

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.

TABLE I (CONTINUED)
BY SEROTYPE AND REPORTING CENTER

REGION AND REPORTING CENTER

WEST NORTH CENTRAL								SOUTH ATLANTIC										
MINN	IOWA	MO	ND	SD	NEBR	KAN	TOTAL	DEL	MD	DC	VA	WV	NC	SC	GA	FLA	TOTAL	SEROTYPE
																		albany
	2						2		1						4		5	anatum
															2		2	bareilly
								1								1	2	berta
				1			1											blegdam
										5	1				2		8	blockley
																		braenderup
															1	4	5	bredeney
																		california
															1		1	chester
											1						1	cholerae-suis v kun
																		corvallis
									1		1						2	cubana
																		denver
								3									3	derby
																		dublin
1		9					10						2		1	3	6	enteritidis
																		essen
																		give
2		2				4	8		5	1					1	2	9	heidelberg
										1							1	indiana
1	1	2					4		5	2	2		9		6	7	31	infantis
		1					1											irumu
		1					1											java
															1	3	4	javiana
																		kaapstad
																		kentucky
																		kottbus
																		lexington
															1	1	2	litchfield
																		livingstone
																		manhattan
															1	11	12	miami
																		mishmar-haemek
																1	1	mission
																		mississippi
									1				1			8	10	montevideo
						4	4									1	1	muenchen
																		newington
1				1		3	5		3				3		1	5	12	newport
																		ohio
3		1					4									2	2	oranienburg
																		panama
																		paratyphi B
																		pensacola
																		poona
1						1	2											reading
		2	1				3		2						7	3	12	saint-paul
																		san-diego
																		schwarzengrund
																		senftenberg
3						1	4		3								3	tennessee
2						2	4		3		1					4	8	thompson
		1					1		4		2	1	5			2	14	typhi
3	7	6	1			8	25		9	2	8		4		9	11	43	typhi-murium
	1						1	1									1	typhi-murium v cop
																		weltevreden
																		westhampton
																		worthington
										1				1			2	Untypable group B
										4							4	Untypable group C-1
																		Untypable group C-2
										1							1	Untypable group O
																		unknown
17	11	25	2	2	-0-	23	80	5	37	17	16	1	24	1	38	69	208	TOTAL

TABLE I (CONTINUED)

SEROTYPE	REGION AND REPORTING CENTER																		
	EAST SOUTH CENTRAL					WEST SOUTH CENTRAL					MOUNTAIN								
	KY	TENN	ALA	MISS	TOTAL	ARK	LA	OKLA	TEX	TOTAL	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOTAL
albany																			
anatum																			
bareilly																			
berta																			
blegdam																			
blockley							1		1	2									
braenderup							1		2	3									
bredeney						1				1									
california																			
chester																			
cholerae-suis v kun																			
corvallis																			
cubana									2	2									
denver							1			1									
derby							2		1	3				2		1			3
dublin																			
enteritidis	2				2		2			2									
essen														1					1
give							3			3									
heidelberg		1	1		2		2			2	1			1		2	5		9
indiana																			
infantis		2			2				3	3				1					1
irumu														1					1
java		1			1		2			2									
javiana									1	1									
kaapstad														1					1
kentucky																			
kottbus														1					1
lexington																			
litchfield																			
livingstone									2	2									
manhattan									1	1									
miami																			
mishmar-haemek																			
mission																			
mississippi																			
montevideo		3			3		1			1				1					1
muenchen								1	1	2	1								1
newington		1			1														
newport	1	5			6		2	2	2	6						1			1
ohio																			
oranienburg									2	2									
panama		1			1	1			1	2									
paratyphi B																			
pensacola								1		1									
poona																			
reading																			
saint-paul							4			4									
san-diego							1			1							3		3
schwarzengrund							1			1									
senftenberg		1			1														
tennessee		1			1			1		1									
thompson		1			1		1			1									
typhi	2	2		8	12	1	6	1	1	9					5				5
typhi-murium		8			8	1	14	1	15	31		2		8		3	2		15
typhi-murium v cop							2			2									
weltevreden																			
westhampton																			
worthington																			
Untypable Group B											1				6	1			8
Untypable Group C-1															4				4
Untypable Group C-2				1	1														
Untypable Group O																			
unknown																			
TOTAL	5	27	1	9	42	4	46	7	35	92	3	2	-0-	17	15	8	10	-0-	55

TABLE I (CONTINUED)

REGION AND REPORTING CENTER						OTHER VI	TOTAL	PERCENT OF TOTAL	TWO MONTH TOTAL	PERCENT OF 2 MO TOTAL	1964 2 MO TOTAL	% OF 1964 2 MO TOTAL	SEROTYPE
PACIFIC													
WASH	ORE	CAL	ALASKA	HAWAII	TOTAL								
							2		3				albany
				2	2		13	1.1	37	1.4	38	1.2	anatum
							2		12		9		bareilly
							2		8		6		berta
							1		1				blegdam
		1		2	3		24	2.0	61	2.2	49	1.6	blockley
1					1		5		10		9		braenderup
				1	1		9		14		65		bredeney
							2		4		4		california
							4	0.3	21	0.8	19	0.6	chester
							3		5		6		cholerae-suis v kun
				1	1		1		1				corvallis
		1			1		11		15		14		cubana
							1		1				denver
				3	3		39	3.3	97	3.5	514	16.9	derby
		1			1		1		1				dublin
		4			4		75	6.3	178	6.5	116	3.8	enteritidis
							1		1				essen
		1			1		9		19		13		give
1	1	12		2	16		89	7.4	215	7.9	183	6.0	heidelberg
							2		3		5		indiana
		4			4		93	7.8	180	6.6	151	5.0	infantis
							2		3				irumu
		4			4		11		26		36		java
							7		25		18		javiana
							1		1				kaapstad
				1	1		1		3		5		kentucky
							4		4				kottbus
		1			1		1		1				lexington
2					2		6		23		5		litchfield
		1			1		4		4				livingstone
1		3		1	5		6		19		38		manhattan
							12		15		8		miami
		1			1		1		1				mishmar-haemek
							1		1				mission
							2		5				mississippi
		2			2		35	2.9	85	3.1	68	2.2	montevideo
1		3			4		17		26		33		muenchen
							3		6		11		newington
3		10		1	14		58	4.8	123	4.5	95	3.1	newport
							2		2				ohio
	2	1			3		27	2.3	88	3.2	91	3.0	oranienburg
		1		1	2		11		23		44		panama
1					1		15	1.3	31	1.1	14	0.5	paratyphi B
							1		1				pensacola
		1			1		4		9		5		poona
							1		1		5		reading
1	2	10		1	14		50	4.2	122	4.5	64	2.1	saint-paul
		5			5		13		41		21		san-diego
		2			2		4		14		15		schwarzengrund
1		1		1	3		6		10		10		senftenberg
							12	1.0	28	1.0	60	2.0	tennessee
2		1			3		27	2.3	56	2.0	48	1.6	thompson
1	1	10			12		68	5.7	140	5.1	107	3.5	typhi
8	4	53		7	72		343	28.6	755	27.6	879	28.9	typhi-murium
							17		37		27		typhi-murium v cop
				2	2		2		6		5		weltevreden
							1		1				westhampton
							1		5		14		worthington
			1		1		13		29		38		Untypable Group B
							6		17		8		Untypable Group C-1
							5		13		2		Untypable Group C-2
		2			2		2		5				Untypable Group O
	1				1		6		14		15		unknown
23	11	136	1	26	197	-0-	1,198		2,736		3,043		TOTAL

(VI - Virgin Islands)

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

S E R O T Y P E	Month(s)	Reporting Center(s)	Number of Isolations
carrau	Jan	La	1
cholerae-suis	Jan	Ohio	1
colorado	Jan	Hawaii	1
duesseldorf	Jan	Ohio	1
florida	Jan	Fla	1
hartford	Jan	Ind(1)	
	Jan	Va(1)	
	Jan	Fla(2)	4
heilbron	Jan	Mo	1
luciana	Jan	Ariz	1
meleagridis	Jan	Ill(1)	
	Jan	Md(2)	3
norwich	Jan	Ga(1)	
	Jan	Tex(1)	2
oslo	Jan	Hawaii	1
paratyphi-A	Jan	Calif	2
rubislaw	Jan	La	2
siegburg	Jan	Ill	1
stanley	Jan	Kan	1
taksony	Jan	N.Y.-BI	1
thomasville	Jan	N.J.	1
urbana	Jan	Ill	1
virchow	Jan	Colo	1
TOTAL			27

TABLE II

REPORTED ISOLATIONS OF *S. TYPHI*, BY PATIENT STATUS – FEBRUARY 1965

STATE	REPORTED TO SALMONELLA SURVEILLANCE UNIT								CLINICAL CASES REPORTED IN MMWR	
	Cases		Carriers		Unknown		Total			
	Feb.	1965 Cuml.	Feb.	1965 Cuml.	Feb.	1965 Cuml.	Feb.	1965 Cuml.	Feb.	1965 Cuml.
UNITED STATES	10	24	29	49	29	67	68	140	25	51
NEW ENGLAND	–	–	–	–	1	3	1	3	–	–
Maine	–	–	–	–	–	–	–	–	–	–
New Hampshire	–	–	–	–	–	–	–	–	–	–
Vermont	–	–	–	–	–	–	–	–	–	–
Massachusetts	–	–	–	–	1	1	1	1	–	–
Rhode Island	–	–	–	–	–	2	–	2	–	–
Connecticut	–	–	–	–	–	–	–	–	–	–
MIDDLE ATLANTIC	2	3	3	4	2	4	7	11	3	5
New York	2	3	1	2	2	3	5	8	3	5
New Jersey	–	–	–	–	–	1	–	1	–	–
Pennsylvania	–	–	2	2	–	–	2	2	–	–
EAST NORTH CENTRAL	1	3	5	6	1	4	7	13	6	7
Ohio	1	1	2	3	1	1	4	5	2	2
Indiana	–	–	2	2	–	1	2	3	2	2
Illinois	–	–	–	–	–	2	–	2	1	1
Michigan	–	2	1	1	–	–	1	3	1	1
Wisconsin	–	–	–	–	–	–	–	–	–	1
WEST NORTH CENTRAL	–	1	–	2	1	3	1	6	2	3
Minnesota	–	–	–	1	–	–	–	1	–	–
Iowa	–	–	–	–	–	–	–	–	–	–
Missouri	–	1	–	1	1	3	1	5	2	3
North Dakota	–	–	–	–	–	–	–	–	–	–
South Dakota	–	–	–	–	–	–	–	–	–	–
Nebraska	–	–	–	–	–	–	–	–	–	–
Kansas	–	–	–	–	–	–	–	–	–	–
SOUTH ATLANTIC	4	5	7	12	3	7	14	24	7	16
Delaware	–	–	–	–	–	–	–	–	1	2
Maryland	–	–	2	2	2	5	4	7	3	6
District of Columbia	–	–	–	–	–	–	–	–	–	–
Virginia	1	1	1	1	–	–	2	2	2	2
West Virginia	1	1	–	1	–	–	1	2	–	1
North Carolina	2	2	2	4	1	1	5	7	–	4
South Carolina	–	–	–	–	–	–	–	–	1	1
Georgia	–	–	–	1	–	1	–	2	–	–
Florida	–	1	2	3	–	–	2	4	–	–
EAST SOUTH CENTRAL	–	–	6	8	6	8	12	16	1	3
Kentucky	–	–	–	1	2	2	2	3	–	–
Tennessee	–	–	1	1	1	1	2	2	1	2
Alabama	–	–	–	–	–	–	–	–	–	1
Mississippi	–	–	5	6	3	5	8	11	–	–
WEST SOUTH CENTRAL	3	10	6	15	–	2	9	27	1	9
Arkansas	–	1	1	5	–	–	1	6	–	3
Louisiana	2	5	4	9	–	–	6	14	1	2
Oklahoma	1	1	–	–	–	1	1	2	–	1
Texas	–	3	1	1	–	1	1	5	–	3
MOUNTAIN	–	2	1	1	4	17	5	20	4	6
Montana	–	–	–	–	–	1	–	1	–	–
Idaho	–	–	–	–	–	–	–	–	–	–
Wyoming	–	–	–	–	–	–	–	–	–	1
Colorado	–	–	–	–	–	–	–	–	–	–
New Mexico	–	2	1	1	4	16	5	19	2	3
Arizona	–	–	–	–	–	–	–	–	2	2
Utah	–	–	–	–	–	–	–	–	–	–
Nevada	–	–	–	–	–	–	–	–	–	–
PACIFIC	–	–	1	1	11	19	12	20	1	2
Washington	–	–	–	–	1	1	1	1	–	–
Oregon	–	–	1	1	–	–	1	1	–	–
California	–	–	–	–	10	17	10	17	1	1
Alaska	–	–	–	–	–	–	–	–	–	–
Hawaii	–	–	–	–	–	1	–	1	–	1
Virgin Islands	–	–	–	–	–	–	–	–	*	*

*Does not report.

TABLE III

Infrequent Serotypes

Serotype	Center	February	1965*	Total 1963 & 1964**	Comment
S. albany	CONN & ILL	2	3	9	Second isolation in as many months from ILL.
S. blegdam	SD	1	1	1	The 1963-64 and 1965 isolates are father and son.
S. corvallis	HAI	1	1	1	Originally isolated from poults with enteritis.
S. denver	LA	1	1	1	Originally isolated from irrigation water in COLO; has been isolated from eggs and egg powder.
S. dublin	CALIF	1	1	5	A continuing manifestation of an endemic problem.
S. essen	COLO	1	1	6	Five of the 1964 isolates were from COLO.
S. irumu	COLO & MO	2	3	83	Continuing local cycles appear to be operating in these two States
S. kaapstad	COLO	1	1	0	Reported in 1962 from COLO and OHIO
S. kottbus	NY-A-3 COLO-1	4	4	5	The COLO isolate was from an 8 year old Peruvian boy, and the NY isolates represent a family incident.
S. lexington	CALIF	1	1	3	Has been reported from chickens, turkey, and swine.
S. mishmar-haemek	CALIF	1	1	1	1963-64 isolate also reported from CALIF but may have originated in MICH.
S. mission	FLA	1	1	4	Isolated from a 2 year old girl with vehicle of infection undetermined.
S. ohio	CONN & WIS	2	2	4	1964 nonhuman isolates were from eggs, feed and tankage in Ohio.
S. pensacola	OKLA	1	1	15	Most human and nonhuman isolates from the Southeast.
S. westhampton	MASS	1	1	2	Isolate may be related to contaminated frozen eggs.

* Represents 2,736 human isolations of salmonellae during the first 2 months of 1965.

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

TABLE IV

Age and Sex Distribution of 1,166 Isolations of Salmonellae
Reported for February 1965

Age	Male	Female	Total	%	Cumulative %
Under 1	82	82	164	21.6	21.6
1-4 yrs.	108	83	191	25.2	46.8
5-9 yrs.	54	41	95	12.5	59.3
10-19 yrs.	31	26	57	7.5	66.8
20-29 yrs.	12	34	46	6.1	72.9
30-39 yrs.	16	17	33	4.4	77.3
40-49 yrs.	18	24	42	5.5	82.8
50-59 yrs.	25	31	56	7.4	90.2
60-69 yrs.	21	17	38	5.0	95.2
70-79 yrs.	6	19	25	3.3	98.5
80+	3	7	10	1.3	99.8
Unknown	209	200	409		
Total	585	581	1,166		
% of Total	50.2	49.8			

TABLE V

REPORTED NON-HUMAN ISOLATES BY SEROTYPE AND SOURCE, FEBRUARY, 1965

SEROTYPE	chicken	turkey	pigeon	domestic fowl environment	pheasant	quail	avian	equine	bovine	porcine	feline	guinea pig	monkey	capybara	egg	egg yolk	egg albumin	powdered egg	frozen egg	powdered egg yolk	egg product	egg shell	poultry products unknown	human dietary supplement	noodles	poultry-by-products	bone meal	animal feed	fish meal	tankage	turtle	water	hospital sink	unknown	Total	2 Mos Total	SEROTYPE
alachua																		4	2	1							1								8	10	alachua
albany	1																																		1	1	albany
anatum	1	3				1				1				1								1	2					5							15	31	anatum
bareilly	1																						1												2	2	bareilly
berta																														1				1	1	berta
binza	1																										1							2	11	binza
blockley	5	5																					15											25	46	blockley
bredeney	1																											1					2	4	13	bredeney
california	2	2																					1											5	7	california
cerro																	1										1						1	3	4	cerro
chester		6		2						8																								8	30	chester
cholerae-suis v kun																																		8	15	cholerae-suis v kun
derby	1								1	1																								3	12	derby
dublin									6																									6	10	dublin
enteritidis	1										1																							2	4	enteritidis
gallinarum	5																																	5	8	gallinarum
give		1																																1	4	give
heidelberg	13	10							1														35											59	136	heidelberg
infantis	2	2														1		1					3							1				10	57	infantis
kentucky																											1							1	5	kentucky
livingstone	6																											2						8	23	livingstone
manhattan		12																																12	13	manhattan
meleagridis		4						1																										5	6	meleagridis
miami																	1	1																2	2	miami
minnesota		1																								1								2	4	minnesota
montevedio	3						1																3				1					1	1	10	35	montevedio
muenchen	2																						1					1			1			5	8	muenchen
newington										1																								1	2	newington
newport	3								2																									5	13	newport
norwich	1																																	1	1	norwich
oranienburg														1				2					3					5	1				1	13	16	oranienburg
panama										1																								1	1	panama
pullorum	26	2							1																									29	65	pullorum
reading		2																																2	7	reading
saint-paul	1	17																																18	38	saint-paul
san-diego		9		2																				2										11	30	san-diego
schwarzengrund		2			1																													5	15	schwarzengrund
senftenberg	1																											1						2	9	senftenberg
tennessee	1																1																	2	10	tennessee
thompson	2			1												1							6								1			11	23	thompson
typhi-murium	6	17	1					5	14	1	2	1	1									2	10		2					1	1	1		65	127	typhi-murium
typhi-murium v cop	6	2	2							1		1											4											16	44	typhi-murium v cop
typhi-suis										1																								1	1	typhi-suis
westhampton																							1											1	1	westhampton
worthington	1	1																					3						1					6	10	worthington
untypable group B									3																									3	4	untypable group B
untypable group O		1																																1	1	untypable group O
TOTAL	93	99	3	5	1	1	1	6	28	15	3	2	1	1	1	2	2	9	2	1	2	1	88	2	2	1	5	15	2	2	4	1	1	5	407	941	TOTAL

Source: National Disease Laboratory, Ames, Iowa and Weekly Salmonella Surveillance Reports from Individual States

TABLE VI

REPORTED NON-HUMAN ISOLATES BY SEROTYPE AND STATE FEBRUARY, 1965

SEROTYPE	STATE																															Total	2 Mos Total	SEROTYPE
	Ala	Ariz	Ark	Calif	Colo	Dela	Fla	Ga	Ida	Ill	Ind	Kan	Md	Mass	Mich	Minn	Miss	Mo	Mont	N.H.	N.J.	N.C.	Ohio	Ore	Pa	S.C.	Tenn	Tex	Utah	Va	Wash	Wisc			
alachua											1					4												1	2				8	10	alachua
albany																												1					1	1	albany
anatum		2		2				1			1			2	1	1		1					3			1						15	31	anatum
bareilly								1						1																		2	2	bareilly
berta							1																									1	1	berta
binza																	1								1							2	11	binza
blockley	1		1	3										15		2	2	1														25	46	blockley
bredeney				3		1																										4	13	bredeney
california			2	1	1									1																		5	7	california
cerro																1							1		1							3	4	cerro
chester				2												4															2	8	30	chester
cholerae-suis v kun											3	1					1					1				2						8	15	cholerae-suis v kun
derby											2																	1				3	12	derby
dublin				6																												6	10	dublin
enteritidis	1	1																														2	4	enteritidis
gallinarum				1		1										2					1							1				5	8	gallinarum
give				1																												1	4	give
heidelberg	1	1	7	7				5					1	35			1														1		59	136	heidelberg
infantis				2							1			3		1		1					1									1	10	57	infantis
kentucky																									1								1	5	kentucky
livingstone			1			2											5																8	23	livingstone
manhattan				12																													12	13	manhattan
meleagridis				1												4																	5	6	meleagridis
miami																1		1															2	2	miami
minnesota				1									1																				2	4	minnesota
montevedio	1			1				2						3	1										1			1				10	35	montevedio
muenchen							1							1			1	1					1										5	8	muenchen
newington										1																							1	2	newington
newport		1																	1									2		1			5	13	newport
norwich																						1											1	1	norwich
oranienburg				1		1								3		2							6										13	16	oranienburg
panama																							1										1	1	panama
pullorum	1					1		2			10		1			2								1						11			29	65	pullorum
reading				2																													2	7	reading
saint-paul				2												15												1					18	38	saint-paul
san-diego				11																													11	30	san-diego
schwarzengrund																		2				1						2					5	15	schwarzengrund
senftenberg						1											1																2	9	senftenberg
tennessee											1																				1		2	10	tennessee
thompson			1	2			1							6									1										11	23	thompson
typhi-murium		2		29	3		1			1	7			10	1	1		6					1					2	1				65	127	typhi-murium
typhi-murium v cop			3			1		1						4			1	2		1					2							1	16	44	typhi-murium v cop
typhi-suis				1																													1	1	typhi-suis
westhampton														1																			1	1	westhampton
worthington			1			1								3																		1	6	10	worthington
untypable group B				1					2																								3	4	untypable group B
untypable group O				1																													1	1	untypable group O
TOTAL	5	7	16	92	4	9	4	12	2	2	26	1	3	88	3	40	13	15	1	1	1	3	15	1	6	3	3	6	5	13	2	5	407	941	TOTAL

Source: National Animal Disease Laboratory, Ames, Iowa and Weekly Salmonella Surveillance Reports from Individual States.

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

Serotype	Month	Reporting Center(s)	Number of Isolations
braenderup	Jan	Conn (1)	
	Jan	Ind (1)	2
brandenburg	Jan	NC	1
cubana	Jan	NC	2
florida	Jan	Ill	1
goerlitz	Jan	Wash	1
indiana	Jan	Ind	4
java	Jan	Minn	1
javiana	Jan	Fla	1
lexington	Jan	Tenn	1
mission	Jan	Ark (1)	
	Jan	SC (1)	2
muenster	Jan	Fla (1)	
	Jan	Miss (1)	2
orion	Jan	Miss (1)	
	Jan	Mont (1)	2
poona	Jan	Tenn	1
tallahassee	Jan	Fla	1
westerstede	Jan	Miss	2
TOTAL			24

TABLE VII

Salmonella derby Isolations and Total Salmonella Isolations Reported by Month*

		Total Salmonella Isolations	S. derby Isolations	Per Cent of Total
1962	November	922	18	2.0
	December	794	16	2.0
1963	January	1,111	30	2.7
	February	1,059	22	2.1
	March	931	28	3.0
	April	1,330	61	4.6
	May	1,738	139	8.0
	June	1,640	203	12.4
	July	2,133	303	14.2
	August	1,770	155	8.8
	September	1,786	164	9.2
	October	2,462	228	9.3
	November	1,381	127	9.2
	December	1,439	175	12.2
1964	January	1,601	213	13.3
	February	1,442	301	20.9
	March	1,279	290	22.7
	April	1,882	399	21.2
	May	1,545	277	18.0
	June	1,758	195	11.1
	July	2,159	217	10.1
	August	1,777	151	8.5
	September	2,624	109	4.2
	October	1,848	85	4.6
	November	1,595	69	4.3
	December	1,719	76	4.4
1965	January	1,538	58	3.8
	February	1,198	39	3.3

*As reported to the Salmonella Surveillance Unit from 50 States and the District of Columbia.

TABLE VIII

The Seven Most Commonly Recovered Salmonella Serotypes from Human and Nonhuman Sources in The Netherlands - 4th Quarter, 1964

	Human			Nonhuman		
Rank	Serotype	No.	%	Serotype	No.	%
1	S. typhi-murium & S. typhi-murium var. copenhagen	733	41.3	S. typhi-murium & S. typhi-murium var. copenhagen	400	35.5
2	S. panama	377	21.2	S. dublin	183	16.2
3	S. stanley	283	15.9	S. bareilly	128	11.3
4	S. bovis-morbificans	65	3.7	S. panama	82	7.3
5	S. newport	39	2.2	S. give	59	5.2
6	S. heidelberg	37	2.1	S. oranienburg	39	3.5
7	S. muenchen	31	1.7	S. stanley	23	2.0
	Total	1,565	88.1		914	81.0
	Total (all serotypes)	1,776			1,128	

CENTERS CONTRIBUTING TO THIS REPORT

REPORTING CENTER & CODE	EPIDEMIOLOGIST	LABORATORY
ALA Alabama State Dept. of Public Health, Montgomery, Alabama.	W.H.Y. Smith, M.D.* Dir. of Prev. Dis. State Dept. of Public Hlth. State Office Building Montgomery, Alabama 36104	Thomas S. Hosty, M.D. Dir. of Laboratories State Dept. of Public Hlth. State Health Building Montgomery, Alabama 36104
ALAS Alaska Branch of Public Health Laboratory, Anchorage, Alaska.	Dr. Thomas R. McGowan State Epidemiologist Alaska Dept. of Hlth. & Welfare - P.O. Box 3-200 Alaska Ofc. Bldg. Juneau, Alaska 99801	Ralph B. Williams, M.D.* Chief of Laboratories Alaska Dept. of Hlth. & Welfare - P.O. Box 3-200 Alaska Ofc. Bldg. Juneau, Alaska 99801
ARIZ Arizona State Dept. of Health, Phoenix, Arizona.	Philip M. Hotchkiss, DVM Acting Director Acute Comm. Dis. Control State Department of Hlth. State Office Building Phoenix, Arizona 85007	H. Gilbert Crecelius, Ph.D.* Dir. of State Laboratories State Department of Health State Office Building Phoenix, Arizona 85007
ARK Arkansas State Board of Health, Little Rock, Arkansas.	William L. Bunch, Jr., M.D. Acting Director Comm. Disease Control State Board of Hlth. State Health Bldg. State Capitol Grounds Little Rock, Arkansas 72201	Ruth R. Almaden, M.S.* Dir. of Laboratories State Board of Health State Health Bldg. State Capitol Grounds Little Rock, Arkansas 72201
CAL California State Dept. of Public Health, Berkeley 4, California.	Philip K. Condit, M.D. Chief, Comm. Diseases State Dept. of Pub. Hlth. 2151 Berkeley Way Berkeley, California 94704	Howard L. Bodily, Ph.D.* Chief of Laboratories State Dept. of Pub. Hlth. 2151 Berkeley Way Berkeley, California 94704
COL Colorado State Dept. of Public Health, Denver 20, Colorado.	Cecil S. Mollohan, M.D.* Chief of Epidemiology State Dept. of Pub. Hlth. 4210 East Eleventh Ave. Denver, Colorado 80220	C. D. McGuire, Ph.D. Dir. of Lab. Services State Dept. of Pub. Hlth. 4210 East Eleventh Ave. Denver, Colorado 80220

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*Reporting Official.

REPORTING CENTER & CODE	EPIDEMIOLOGIST	LABORATORY
CONN Connecticut State Dept. of Health, Hartford 15, Conn.	James C. Hart, M.D. Dir. of Prev. Dis. State Dept. of Hlth. 79 Elm Street Hartford, Connecticut 06115	Earle K. Borman, M.S.* Dir. of Lab. Services State Dept. of Hlth. 79 Elm Street Hartford, Connecticut 06115
D.C. District of Columbia Dept. of Pub. Hlth., Washington 1, D.C.	William E. Long, Chief Epi.* Bureau of Disease Control D.C. Dept. of Pub. Hlth. 300 Indiana Ave., N.W. Washington, D.C. 20001	William N. Wooldridge, M.D. Chief of Laboratories D.C. Dept. of Pub. Hlth. 300 Indiana Ave., N.W. Washington, D.C. 20001
DEL Delaware State Board of Health, Dover, Delaware.	Floyd I. Hudson, M.D. Executive Secretary State Board of Hlth. State Hlth. Bldg. Dover, Delaware 19901	Irene V. Mazeika, M.D.* Dir. of Laboratories State Board of Health State Hlth. Bldg. Dover, Delaware 19901
FLA Florida State Board of Health, Jacksonville 1, Fla.	E. Charlton Prather, M.D. Dir., Div. of Epi. State Board of Hlth. 1217 Pearl Street Jacksonville, Fla. 32201	Nathan J. Schneider, Ph.D.* Dir. of Laboratories State Board of Hlth. 1217 Pearl Street Jacksonville, Fla. 32201
GA Georgia Dept. of Public Health, Atlanta, Ga.	W. J. Murphy, M.D.* Dir. of Epid. Invest. Ga. Dept. of Pub. Hlth. State Hlth. Bldg. Atlanta, Georgia 30303	E. E. Long, M.S. Dir. of Laboratories Ga. Dept. of Pub. Hlth. State Hlth. Bldg. Atlanta, Georgia 30303
HAI Hawaii Dept. of Health, Honolulu 1, Hawaii.	William F. Lyons, M.D. Chief of Epidemiology Hawaii Dept. of Hlth. Kinau Hale, P.O. Box 3378 Honolulu, Hawaii 96801	Kingston S. Wilcox, M.D.* Chief, Bur. of Lab. Hawaii Dept. of Hlth. Kinau Hale, P.O. Box 3378 Honolulu, Hawaii 96801
IDA Idaho Dept. of Health, Boise, Idaho.	John A. Mather, M.D.* Dir. of Prev. Med. Idaho Dept. of Health State House Boise, Idaho 83702	Darrell Brock, M.P.H. Chief of Laboratories Idaho Dept. of Health State House Boise, Idaho 83702

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ILL Illinois Dept. of Public Health, Springfield, Illinois.	Norman J. Rose, M.D. Chief of Epidemiology Ill. Dept. of Pub. Hlth. State Ofc. Bldg. 400 So. Spring Street Springfield, Illinois 62706	Howard J. Shaughnessy, Ph.D.* Chief of Laboratories Ill. Dept. of Pub. Hlth. State Ofc. Bldg. 400 So. Spring Street Springfield, Illinois 62706
IND Indiana State Board of Health, Indianapolis 7, Ind.	A. L. Marshall, Jr., M.D.* Dir. of Prev. Med. State Board of Health 1330 West Michigan St. Indianapolis, Indiana 46207	Josephine Van Fleet, M.D. Dir. of Laboratories State Board of Health 1330 West Michigan St. Indianapolis, Indiana 46207
IOWA Iowa State Dept. of Health, Des Moines, Iowa.	Ralph H. Heeren, M.D.* Dir. of Prev. Diseases State Dept. of Health State Office Building Des Moines, Iowa 50319	W. J. Hausler, Jr., Ph.D. Acting Dir. State Hygiene Lab. University of Iowa Medical Laboratory Bldg. Iowa City, Iowa 52240
KANS Kansas State Board of Health, Topeka, Kansas.	Don E. Wilcox, M.D. Dir., Comm. Diseases State Dept. of Health State Office Bldg. Topeka Ave. at Tenth Topeka, Kansas 66612	Nicholas D. Duffett, Ph.D.* Dir. of Pub. Hlth. Lab. State Dept. of Hlth. State Office Bldg. Topeka Ave. at Tenth Topeka, Kansas 66612
KY Kentucky Dept. of Health, Frankfort, Kentucky.	Dr. William McBeath State Epidemiologist State Dept. of Hlth. 275 East Main Street Frankfort, Ky. 40601	Buster F. Brown, M.D.* Dir. of Pub. Hlth. Lab. State Dept. of Hlth. 275 East Main Street Frankfort, Ky. 40601
LA Louisiana State Board of Health, New Orleans, La.	Dr. John M. Bruce Chief, Sect. of Epi. State Board of Hlth. 325 Loyola Ave. New Orleans, La. 70160	Dr. George H. Hauser* Dir. of Laboratories State Board of Hlth. 325 Loyola Ave. New Orleans, La. 70160
ME Maine Dept. of Health, Augusta, Maine.	Dr. Dean Fisher, Dir. Comm. Dis. Control Bureau of Health State House Augusta, Maine 04330	Dr. Charles H. Okey* Dir. of Diagnostic Lab. Bureau of Health State House Augusta, Maine 04330

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MAS Mass. Dept. of Public Health, Boston 33, Mass.	Dr. Nicholas J. Fiumara Dir. of Comm. Diseases Mass. Dept. of Pub. Hlth. 15 Ashburton Drive Boston, Mass.	Dr. Robert MacCready, Dir.* Div. of Diagnostic Lab. Mass. Dept. of Pub. Hlth. 281 South Street Jamaica Plain 30, Mass. Dr. Geoffrey Edsall Superintendent Institute of Lab. 375 South Street Boston 30, Mass.
MD Maryland Dept. of Hlth. Baltimore 1, Maryland.	Dr. John H. Janney* Acting Chief of Epi. State Dept. of Hlth. State Ofc. Bldg. 301 West Preston St. Baltimore, Md. 20201	Dr. Robert L. Cavenaugh, Ch. Bureau of Laboratories Md. State Dept. of Hlth. 16 East 23rd Street Baltimore, Md. 21218
MICH Michigan Dept. of Hlth. Lansing 4, Michigan	Dr. George H. Agate Dir. of Epidemiology Mich. Dept. of Hlth. 3500 North Logan St. Lansing, Mich. 48914	Dr. G. D. Cummings* Dir. of Laboratories Mich. Dept. of Hlth. 3500 North Logan St. Lansing, Mich. 48914
MINN Minnesota Dept. of Health, Minneapolis, Minn.	Dr. D.S. Fleming* Dir. of Dis. Prev. and Control State Dept. of Hlth. University Campus Minneapolis, Minn. 55440	Henry Bauer, Ph.D. Dir. of Med. Lab. State Dept. of Hlth. University Campus Minneapolis, Minn. 55440
MISS Mississippi State Board of Hlth. Jackson 5, Miss.	Dr. Durward L. Blakey* Dir. of Prev. Dis. Cont. P.O. Box 1700 Jackson, Miss. 39205	Richard H. Andrews, M.S. Dir. of Pub. Hlth. Lab. P.O. Box 1700 Jackson, Miss. 39205
MO Missouri Dept. of Hlth. Jefferson City, Mo.	Dr. E. A. Belden Consultant, Comm. Dis. Cont., Mo. Dept. of Pub. Hlth. & Welfare State Office Bldg. Jefferson City, Missouri	Irma C. Adams, Dir.* Bur. of Laboratories Missouri Div. of Hlth. Broadway & High Sts. Jefferson City, Missouri

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MONT Montana State Board of Health, Helena, Montana.	Dr. Mary E. Soules* Dir. of Dis. Control State Board of Health Laboratory Building Helena, Mont. 59601	Edith Kuhns, B.S. Dir. of Lab.-Micro. State Board of Hlth. Laboratory Building Helena, Mont. 59601
NEB State of Nebraska Dept. of Hlth., Lincoln 9, Nebraska.	Dr. E. A. Rogers, Dir Prev. Hlth. Services State Dept. of Hlth. Lincoln, Neb. 68509	Mr. H. E. McConnell, Dir.* Laboratory Services State Dept. of Health State Capitol Bldg. Lincoln, Neb. 68509
NEV Nevada State Dept. of Health, Reno, Nevada.	Dr. B. A. Winne, Chief Prev. Medical Services State Dept. of Hlth & Wel. 790 Sutro Street Reno, Nevada 89502	Dr. Lionel M. Groves, Dir.* Bur. of Pub. Hlth. Lab. State Dept. of Hlth. 790 Sutro Street Reno, Nevada
NH New Hampshire State Dept. of Health, Concord, New Hampshire.	Dr. William M. Prince* Dir. of Comm. Dis. Cont. State Dept. of Hlth. & Wel. State House Concord, New Ham. 03301	Robert Miliner, Supervisor Clinical Laboratory State Dept. of Hlth. & Wel. State House Concord, New Ham. 03301
NM New Mexico Dept. of Health, Albuquerque, New Mex.	H. G. Doran, Jr., DVM Dir. of Comparative Med. N.M. Dept. of Pub. Hlth. 408 Galisteo Street Santa Fe, N.M. 87501	Dr. Daniel E. Johnson* Div. of Pub. Hlth. Lab. State Dept. of Pub. Hlth. 305 Terrace Ave. N.E. Albuquerque, New Mexico
ND North Dakota State Dept. of Hlth., Bismarck, North Dakota.	Kenneth Mosser, Dir.* Preventable Dis. State Dept. of Hlth. Capitol Bldg. Bismarck, N. Dak. 58501	Mr. Melvin E. Koons Chief, Lab. Services State Dept. of Hlth. Box C. University Station Grand Forks, N. Dak.
NY-A New York State Dept. of Health, Albany 8, New York.	Dr. Robert M. Albrecht Dir. of Epidemiology State Dept. of Hlth. 84 Holland Ave. Albany, New York 12208	Dr. Victor N. Tompkins* Asst. Comm., Div. of Lab. & Research, State Dept. of Hlth., New Scotland Ave. Albany 8, New York

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NY-C Bureau of Preventable Disease, Dept. of Health, New York 13, N.Y.	Dr. Harold T. Fuerst* Dir., Bur. of Prev. Dis. Department of Health 125 Worth Street New York, New York	Dr. Morris Schaeffer, Dir. Bureau of Laboratories City of N.Y. Dept. of Hlth. Foot of East 15th Street New York, N.Y. 10009
NY-BI Beth Israel Hospital New York, New York		Dr. William Antopol Dir. of Labs. & Research Beth Israel Hospital 10 Nathan D. Perlman Pl. New York, N.Y. 10003 Dr. Joseph W. Winter* Beth Israel Hospital 10 Nathan D. Perlman Pl. New York, N.Y. 10003
NC North Carolina State Board of Health, Raleigh,N.C.	Dr. Jacob Koomen, Jr.* Asst. Sec. & State Health Director State Board of Hlth. 225 North McDowell St. Raleigh, N.C. 27602	Dr. Lynn G. Maddry Act. Dir. of Lab. State Dept. of Hlth. 214 West Jones St. Raleigh, North Carolina
NJ State of New Jersey, Department of Health, Trenton, New Jersey.	Dr. William J. Dougherty* Dir. Div. of Preventable Disease Control State Dept. of Hlth. 129 East Hanover Street Trenton, N.J. 08625	Dr. Martin Goldfield Dir. of Lab. State Dept. of Hlth. 129 East Hanover St. Trenton, N.J. 08625
OH Ohio Dept. of Health, Columbus 15, Ohio.	Dr. Calvin B. Spencer Act. Ch., Prev. Med. Ohio Dept. of Hlth. 306 Ohio Dept. Bldg. Columbus 10, Ohio	Dr. C. C. Croft, Chief* Div. of Laboratories Ohio State Dept. of Hlth. West 10th Ave., OSU Campus Columbus, Ohio 43215
OKLA Okla. Dept. of Pub. Health, 3400 North Eastern, Oklahoma City, Okla.	Dr. F. R. Hassler, Ch. Comm. Dis. Cont. & Laboratory Services 3400 North Eastern Oklahoma City, Okla.	Dr. F. R. Hassler, Ch.* Comm. Dis. Cont. & Laboratory Services 3400 North Eastern Oklahoma City, Okla. 73105

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ORE Oregon State Board of Health, Portland, Oregon.	Dr. H. Grant Skinner* Dir. of Epi. & VD State Board of Hlth. 1400 So. West 5th Ave. Portland, Ore. 97201	Gatlin R. Brandon, M.P.H. Dir. of Pub. Hlth. Lab. State Board of Hlth. 1400 So. West 5th Ave. Portland, Ore. 97201
PA Pennsylvania Dept.of Health, Harrisburg, Pa.	Dr. William D. Schrack,Jr.* Dir. of Comm. Diseases State Capitol Health & Welfare Bldg. Harrisburg, Pa. 17120	Dr. Ralph B. Hogan, Dir. Div. of Laboratories State Dept. of Hlth. Corinthian Ave. & Popular St. Philadelphia 30, Pa.
RI Rhode Island Dept. of Health, Providence 2, R.I.	Dr. James E. Bowes* Chief, Epidemiology Rhode Island Dept. of Hlth. State Office Building Providence, R.I. 02903	Mr. Malcolm H. Hinchliffe Acting Chief of Lab. Rhode Island Dept. of Hlth. State Office Building Providence, R.I. 02903
SC South Carolina State Board of Health, Columbia 1, S.C.	Dr. G. E. McDaniel* Dir. of Dis. Control State Board of Hlth. 424 Wade Hampton Bldg. Columbia, S.C. 29201	Dr. Eleanor W. Townsend Dir. of Laboratories State Board of Hlth. 424 Wade Hampton Bldg. Columbia, S.C. 29201
SD South Dakota State Board of Health, Pierre, South Dakota.	Dr. G.J. Van Heuvelen, MPH Act. Dir., Prev. Dis. Cont. State Dept. of Health State Capitol Pierre, S. Dak. 57501	Ben E. Diamond, M.S.* Director of Laboratories State Dept. of Health State Capitol Pierre, S. Dak. 57501
TENN Tenn. Dept. of Public Health, Nashville, Tennessee.	Dr. C. B. Tucker* Dir. & Assist. Comm. Prev. Diseases Tenn. Dept. of Pub. Hlth. Cordell Hall Bldg., 6th Ave. Nashville, Tenn. 37219	Dr. George M. Cameron Dir. of Laboratories Tenn. Dept. of Pub. Hlth. Cordell Hall Building Sixth Ave., North Nashville, Tenn. 37219
TEX Texas State Dept. of Health, Austin 5, Texas.	Dr. Van C. Tipton, Dir. Comm. Dis. Division State of Tex. Dept. of Hlth. Austin, Texas 78756	J. V. Irons, Sc. D.* Chief of Laboratories State Dept. of Hlth. 1100 West 49th Street Austin, Texas 78756

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UTAH Utah State Dept. of Health, Salt Lake City, Utah.	Dr. Elton Newman, Dir.* Prev. Med. & Med. Fac. State Dept. of Hlth. 45 Fort Douglas Blvd. Salt Lake City, Utah	Dr. Russell S. Fraser Dir. of Laboratory State Dept. of Hlth. 45 Fort Douglas Blvd. Salt Lake City, Utah 84113
VA State Dept. of Health, Richmond 19, Virginia.	Dr. James B. Kenley Dir. of Epidemiology State Dept. of Hlth. Bank & Governor Sts. Richmond, Va. 23219	W. French Skinner, M.P.H.* Dir. of Laboratories State Dept. of Hlth. Bank & Governor Sts. Richmond, Va. 23219
VT Vermont Dept. of Health, Burlington, Vermont.	Dr. Linus J. Leavens, Dir.* Comm. Disease Control Vermont Dept. of Hlth. 115 Colchester Avenue Burlington, Vt. 05402	Dymitry Pomar, DVM Director of Laboratories Vermont Dept. of Hlth. 115 Colchester Avenue Burlington, Vt. 05402
VI Virgin Islands Dept. of Health, St. Thomas, Virgin Isl.	Dr. C. Warren Smith, Dir. Comm. Disease Control Charlotte-Amalie St. Thomas, V. I. 23219	Ferdinand A. Nicholsen, Jr.* Dir., Pub. Hlth. Lab. Virgin Islands Dept. of Hlth. Charlotte-Amalie St. Thomas, V. I. 23219
WAS Washington State Dept. of Health, Seattle 4, Washington.	Dr. E. A. Ager* Chief of Epidemiology State Dept. of Hlth. Pub. Hlth. Building Olympia, Washington 98502	Dr. W. R. Giedt, Chief Div. of Laboratories Washington Dept. of Hlth. 1409 Smith Tower Seattle, Washington 98104
W. VA State Dept. of Health, Charleston, W. Va.	L. A. Dickerson, D.D.S.* Act. Chief, Dis. Cont. State Dept. of Hlth. 1800 Washington St. E Charleston, W. Va. 25305	Mr. J. Roy Monroe, Acting Dir. of Labs. State Hygienic Lab. W. Va. Dept. of Hlth. 167 Eleventh Ave. So. Charleston, W. Va.
WIS Wisconsin State of Health, Madison 2, Wisconsin.	Dr. Josef Preizler, Dir.* Bur. of Comm. Dis. State Board of Hlth. 1 West Wilson Street Madison, Wisconsin 53702	Dr. A. S. Evans Dir. State of Hygiene State Board of Hlth. 1 West Wilson Street Madison, Wisconsin 53702

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REPORTING CENTER & CODE	EPIDEMIOLOGIST	LABORATORY
WYO Wyoming Dept. of Health, Cheyenne, Wyoming.	Dr. Helen A. Moore* Dir. of Prev. Med. State Dept. of Pub. Hlth. State Office Building Cheyenne, Wyoming 82001	James T. Ritter, B.S. Dir. of Pub. Hlth. Lab. State Dept. of Pub. Hlth. State Office Building Cheyenne, Wyoming 82001

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