REPORT NO. 49
JUNE 1, 1966

CDC

COMMUNICABLE DISEASE CE

SALMONELLA

SURVEILLANCE

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For the Month of May 1966

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:

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I. SUMMARY

This issue of the Salmonella Surveillance Report includes a summary of available information concerning the interstate outbreak of salmonellosis related to nonfat dry milk. The report supplements information provided in a previous issue of the Salmonella Surveillance Report (#47). Also included this month are reports of salmonella isolations from Australia and Belgium for the first quarter of 1966.

During April, an average of 316 recoveries of salmonellae from humans was reported per week. This represented an increase of 41 from March, consistent with the seasonal pattern seen in previous years. The total for April was 1,266 and for the first four months of 1966 was 5,320, 205 less than the same period last year (See Table I and Figure 1).

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

The seven most frequently reported serotypes during March were:

Rank	Serotype	Number	Per Cent	Rank Last Month
1	S. typhi-murium and S. typhi-murium var. copenhagen	347	27.4	1
2	S. heidelberg	135	10.6	3
3	S. infantis	117	9.2	2
4	S. newport	74	5.8	4
5	S. enteritidis	63	5.0	5
6	S. saint-paul	54	4.3	9
7	S. blockley	46	3.6	8
	Total	836	66.0	
	Total (all serotypes)	1,266		

A total of 64 serotypes was reported during April. The seven most common accounted for 66 per cent of all isolations. The age and sex distribution (Table III) were consistent with past experience.

Salmonella infantis remained unusually common during April. A Salmonella infantis alert was included in the February report as a result of a large number of S. infantis isolations reported during the last week in February and the first two weeks in March. To date, no information has been received indicating the source of infection for these S. infantis cases. At the present time, efforts are being made in New York to investigate persons with S. infantis infection within the state. In addition, a hospital nursery outbreak due to S. infantis is currently under investigation by the State Epidemiologist in Alabama.

The importance of obtaining food histories from persons with S. infantis infection cannot be over emphasized. The New York City Health Department has taken the initiative in their area of jurisdiction and has devised a form for follow-up of cases. This form has been reproduced with the permission of Dr. Tibor Fodor, Chief, Bureau of Preventable Diseases, Division of Epidemiology and Diagnosis, and appears at the back of this report as Table VI.

B. Nonhuman

There were 436 isolations of salmonellae from nonhuman sources during April, 318 less than March. Fifty-five serotypes were represented among these isolations which were from 39 different states.

The seven most frequently reported serotypes were:

Rank	Serotype	Predominant Source and No.	No.	Per Cent	Rank Last Month
1	S. typhi-murium and S. typhi-murium var. copenhagen	Bovines (16) and Chickens(10)	60	13.8	1
2	S. heidelberg	Chickens(27) and Turkeys (22)	57	13.1	2
3	S. infantis	Chickens(18)	28	6.4	7
4	S. montevideo	Chickens(12)	25	5.7	3
5	S. anatum	Chickens(3), Turkeys (3), Ducks (3) and Animal Feed (4)	18	4.1	4
6	S. san-diego and S. senftenberg	Turkeys (11) Turkeys (5) and Livestock Feed (4)	13	3.0	Not listed Not listed
	Total		214	49.1	
	Total (all serotypes)		436		

The most prominent nonhuman sources of salmonellae reported during April were chickens, 118 (27.1 per cent); turkeys, 95 (21.8 per cent); animal feeds, 88 (20.2 per cent); and bovines, 33 (7.6 per cent).

As a result of a special study in Louisiana of salmonellae in livestock feed, animal feed has been a prominent nonhuman source for the past two months.

III. CURRENT INVESTIGATIONS

A. Progress Report - Interstate Outbreak of Salmonellosis Related to Nonfat Dry Milk. Compiled by the Salmonella Surveillance Unit from reports received from State Departments of Agriculture and Health, U. S. Public Health Service Division of Environmental Engineering and Food Protection, U. S. Department of Agriculture and the Food and Drug Administration.

A summary of the information regarding an interstate outbreak of Salmonella newbrunswick was presented in a recent issue of the Salmonella Surveillance Report (SSR #47). The epidemiologic pattern of this outbreak suggested that commercial, instant nonfat dry milk was the source of infection. Bacteriologic tests of many brands have consequently been performed by state health departments, U. S. Department of Agriculture, Food and Drug Administration, and the Epidemic Services and the Veterinary Public Health Laboratories of the Communicable Disease Center. Contamination of powdered milk with salmonella has been confirmed by isolations of salmonella serotypes from many different brands of milk.

Isolations of Salmonellae From Dried Milk Products *

Serotype	Number of Plants Involved	Location of Plants	Reporting Agency
S. alachua	2	California	FDA
S. anatum	**	**	CDC
S. binza	1	Illinois	FDA
S. cubana	1	Indiana ***	Oregon State Dept. of Health
S. eimsbeuttel	1	Oklahoma	FDA
S. heidelberg	2	Iowa South Dakota	USDA
S. infantis	1	California	FDA
S. montevideo	8	Iowa (2) Minnesota (4) Wisconsin (2)	USDA
S. new-brunswick	2	Indiana *** Minnesota	FDA, CDC, Indiana State Dept. of Health, Illinois State Dept. of Health Minnesota State Dept. of Health
S. senftenberg	1	Minnesota	USDA
S. tennessee	2	Idaho Minnesota	FDA, USDA

* Reported to the Salmonella Surveillance Unit as of May 28, 1966.

** Isolated from shelf sample of instant nonfat dry milk - origin unknown.

***Indiana plant repackaged products received from a Minnesota plant.

The Oregon State Department of Health has isolated Salmonella cubana from stool specimens of two children in separate families, ages 7 weeks and 9 months. In both instances the children had been fed instant nonfat dry milk. Salmonella cubana was isolated by the laboratory of the Oregon State Health Department from a sample of the product taken from one of the homes. The same brand product had been used by both children. This is the first case of human illness which appears related to a serotype found in dry milk other than S. new-brunswick.

The relation of S. cubana to this problem is of particular interest because of the increase in isolates of this serotype seen in the last year. In 1963, there were 40 isolates of S. cubana reported from humans, and in 1964, there were 63 isolates

reported from the same source. In 1965, the number of isolates increased to 144, and the percentage of these isolates which were obtained from children less than 5 years of age was significantly higher (52.2 per cent) than would be expected from the general experience with salmonella infection. This type of increase, with a predilection for the younger age group, is similar to the pattern that was seen with S. new-brunswick. It is not known whether or not other isolates of S. cubana could be traced to powdered milk.

Based on isolations of S. new-brunswick by the Food and Drug Administration from two shelf samples of a brand of instant nonfat dry milk, investigation of the plant which processed the milk was undertaken. This company produced an estimated 11,000,000 pounds of dry milk in 1965. The plant dries skim milk, instantizes it, and also produces butter from the cream separated from whole milk. A total of 1000 to 1400 farms serve as routine sources of milk processed by the plant.

Processing (Figure 2) begins with skim milk which passes through a plate heater. It is then concentrated by a series of vacuum pan evaporators prior to drying. The two methods of drying generally used by the dry milk industry are the roller method and the spray dryer method. Spray drying, the more common, is used at this plant. The procedure consists of introducing a fine mist of milk, under pressure, into a high temperature chamber in which the milk is dried almost instantaneously. The product, once dried, is known as spray dried base powder. The next step is the agglomerating or instantizing process in which moisture, in the form of steam, is applied to the spray dried powder. It is then redried with a net effect of producing a particle more easily dissolved when mixed with water. This product is instant nonfat dry milk.

The spray dried base powder may be instantized by the plant or sold to other plants which instantize and package it under their own label. Some of the spray dried base powder, which has been subjected to high heat treatment, is used by the baking industry, and some is purchased by state and federal governments. In addition to the products for human consumption, milk of the same quality, subjected to the same processing as the finished product, but having too coarse or fine a particle size, is incorporated into feed rations for various species of animals. It is easily seen that the plant's production reaches the public in many forms under many different labels. Thus far, in checking distribution patterns, 12 of the original 29 S. new-brunswick cases can be associated with milk produced in this plant.

A complete inspection of pasteurization procedures, the design and construction of processing equipment, and the cleaning methods used in the plant was undertaken by Mr. Harold Thompson of the Public Health Service, Division of Environmental Engineering and Food Protection. His report included a number of important observations.

During the initial heating process, skim milk is brought to 162°F. and supposedly is held at this temperature for 10 to 15 seconds. This plant, however, had no thermometric or time controls in the system to assure that all of the milk processed received this treatment. Consequently, there was no assurance of pasteurization. At no point later in the processing does the milk reach high temperatures for a sufficient time to assure pasteurization. Some of the processing temperatures were, in fact, conducive to the growth of microorganisms which may have gained entrance.

Although the equipment for handling liquid milk was well designed and could be easily cleaned, the spray dryer and the instantizing system presented several problems. A baffle plate inside the dryer and the trough and screw used to remove the product provided open seams and crevices which made cleaning extremely difficult. The instantizing system was constructed in such a way that proper cleaning was almost impossible. There were welds with rough surfaces, numerous crevices and

open seams, and a series of thin rods and dividers located in the after-dryer which permitted the build-up of dried milk. Caked material was found inside this equipment at a number of locations.

Plant procedure called for dry cleaning of the spray dryer with brushes each day and wet cleaning once a month. Dry cleaning can be satisfactorily done using vacuum cleaners, brushes, and scrapers, but the methods in this plant were lacking. Periodic wet cleaning, including an acceptable method of bacteriocidal treatment. essential and should be performed whenever inspection of the dryer shows it to be necessary, generally much more often than once a month. The agglomerator had recently been subjected to a weekly wet cleaning, but this was not sufficient.

In this plant, air intakes for the drying and instantizing equipment were located in the same room as the sifting and bagging operations. The nature of the procedure and the product caused considerable amounts of dried milk solids to be present in the air of this room. Large volumes of this heavily laden air were, at times, introduced directly into the milk during the drying and instantizing process. In addition, there was a large direct opening between this room and the one in which milk was concentrated. Therefore, milk dust could also reach the skim milk concentrate through the open tops of holding tanks. It can be seen that this plant had many obvious faults in design and in cleaning procedures which could result in the contamination of the product.

Bacteriologic analyses of the environment and of the milk at several stages were carried out. Ninety environmental swabs collected from various sources in the plant have been negative for salmonella. Two samples of wash water from the agglomerator, collected during the cleaning operation, were positive for S. new-brunswick. Several fine and coarse animal feed samples, both from the bagging chute and from bags in the plant's warehouse, were positive for S. new-brunswick. Samples of the instantized product for human consumption, also collected from the bagging chute and bags in the warehouse, have been positive for S. new-brunswick on several occasions. In addition, isolations of S. new-brunswick have been obtained from spray dried base powders for animal consumption.

Cultures taken from raw milk entering the plant over a 2-week period were negative for salmonella. One isolation of S. typhi-murium has been made from a sample of "separator sludge," a deposit from the equipment which initially separates cream from whole milk in the plant. Further examination of this material from the plant and the dairies supplying it are in progress. Salmonella enteritidis and S. typhi-murium have been isolated from fecal samples of cows from two farms in the area. In addition, S. cubana has been isolated from calf feed from a number of farms. This feed product often contains spray dried milk.

A stool culture survey of the plant's employees revealed 2 of the 14 employees positive for S. new-brunswick.

It is possible that the initial source of contamination in this plant was raw milk. This is consistent with the inadequate pasteurization procedures used. Dairy cows are known to harbor salmonellae, and in 1965 one isolate of S. new-brunswick was made from a dairy cow in California. It is also possible that contamination came from the plant environment. Once introduced into the equipment, there are numerous locations where salmonellae can multiply and remain to seed the products over a period of time.

Certain measures seem indicated to correct contamination in this plant and to prevent it from occurring in other plants. Mr. Thompson has made the following recommendations:

1. Application of the sanitation and pasteurization standards for the manufacture of dry milk products contained in the Public Health Service Dry Milk Ordinance and Code. These standards are based on sound public health practices and have been applied to approximately 43 milk drying plants throughout the country.

2. Steps to provide for proper pasteurization of all products prior to the evaporating or condensing equipment.

3. Utilization of readily cleanable equipment throughout the entire process and initiation of cleaning procedures which will assure effective cleaning of all equipment surfaces.

4. Effective bacteri ocidal treatment of all surfaces including those in the dryer and instantizer. This can be accomplished by any of the methods appearing in the Public Health Service Dry Milk Ordinance and Code.

5. Proper housekeeping and sanitary practices which will reduce the possibility of cross-contamination of the product.

B. Procedure for Examination of Dried and Liquid Milk Products for Salmonellae.

This revised procedure is recommended jointly by Dr. W. H. Ewing, Dr. John R. Boring, and Mrs. Mildred Galton for the examination of dried and liquid milk. It is an abbreviated method for isolating salmonellae only and was agreed upon jointly by the Communicable Disease Center, the Food and Drug Administration, and the Division of Environmental Engineering and Food Protection. The purpose of using this simplified method is to allow the rapid examination of large numbers of samples. It is recommended that a statistically selected number of samples be examined, representing approximately 10 per cent of the units of a lot.

1. Reconstitute 100 grams of powdered milk in 1000 ml. of sterile distilled water in a 2-liter flask or a 2-quart fruit jar. Add 20 ml. of a 0.1% aqueous solution of brilliant green dye (final concentration of 1:50,000*). For the examination of liquid milk, use 1000 ml. in a 2-liter flask or 2-quart fruit jar and add 20 ml. of a 0.1% aqueous solution of brilliant green dye. If screwcaps are used, they should be left loose during incubation.

2. Incubate flasks at 37°C. for 18 to 24 hours.

3. Streak 1 loopful from each flask of both liquid milk and reconstituted milk onto brilliant green agar plates containing sodium sulfadiazine (80 mg. per liter of agar). Also transfer 10 ml. from each flask into 100 ml. of tetrathionate broth containing brilliant green dye (10 ml. of a 0.1% aqueous solution per liter). Pint size, screwtop refrigerator jars are convenient.

4. Incubate plates and tetrathionate broths at 37°C. for 18 to 24 hours.

* North, W. R., Jr. 1960, Use of crystal violet or brilliant green dyes for the determination of salmonellae in dried food products. J. Bact. 80:861.

5. Streak one loopful of tetrathionate broth to a brilliant green sulfadiazine agar plate.

6. Examine all plates for suspicious colonies after 18 to 24 hours in incubator at 37°C.

IV. REPORTS FROM THE STATES

A. Illinois:

Outbreak of Salmonella reading Among Infants in an Orphanage. Reported by Samuel L. Andelman, M.D., Commissioner of Health, Herbert L. Slutsky, M.D., and Olga Brolnitsky, M.D., Epidemiologists, Chicago Board of Health.

On January 15, 1966, one infant in a 20-bed cubicle of an orphanage developed severe diarrhea. Salmonella reading was recovered from a culture of the infant's stool. Rectal swabs taken by the Chicago Board of Health from the other 14 children in the cubicle were also positive for S. reading. Stool cultures from the remaining 58 infants in other wards and nursery personnel were, however, negative for salmonellae.

All of the infants involved were admitted to the orphanage during the months of September and October 1965. During the first week of November, a 2-week-old male was admitted to their cubicle, but was taken out of the orphanage after only three days. Mild diarrhea involved all of the infants of the cubicle within one day of his departure, and though the children suffered no adverse affects, the pattern of loose stools continued until January 1966. A dietary source of salmonella could not be found in the nursery. A standard formula fed to all infants had been tested twice weekly by the Chicago Board of Health Laboratory and found bacteriologically acceptable.

Based on the postulate that the infection may have originated with an infected infant and was spread by the personnel, repeated cultures were taken from the nursery staff. On the third survey, S. reading was isolated from the rectal swab of a nurse assigned to the cubicle. She had been assigned there since September 1965 and had had no symptoms suggestive of salmonella.

Continued surveillance was maintained in the orphanage until all cultures were negative.

Editor's Comment: Most outbreaks of salmonellosis, including those in hospitals and institutions, originate with contaminated foods. Infants, however, constitute a highly susceptible population and transmission of infection in an infant ward has been effected by fomites as well as by carriers. The child who entered the ward in November may have been the originator of the infection, or it may have been the asymptomatic nurse carrier. As illustrated here, salmonellae, once in an institution, may be carried by a number of asymptomatic patients or personnel, making it quite difficult to eradicate.

B. Maryland:

A Case of Typhoid Fever Traced to a Carrier. Reported by Ernest H. Joy, M.D., Communicable Disease Division, and Roy P. Lindgren, M.D., Health Officer, Montgomery County Health Department, Rockville, Maryland.

On April 19, 1966, a 3-year-old child developed chills and fever, accompanied by pharangeal injection and palpable anterior, cervical nodes. On April 21 the child was

admitted to the hospital because of vomiting, diarrhea, and a temperature of 105°F. Treatment with chloramphenicol was initiated on admission, and stool culture was subsequently reported to contain Salmonella typhi, phage type C.

The involved household was investigated by the Montgomery County Health Department. It was exceptionally clean with a good municipal water supply and sewage disposal. None of the other members of the family had been ill, and none had recently traveled away from the community. Four of the adult members of the family had had typhoid fever in the past, two while living in Greece and two in Albania. Three of the 4 had been in this country for a number of years, but the fourth, the maternal grandmother, age 65, had arrived in the United States from Athens, Greece during the first week of January 1966. She had had typhoid fever in 1943 while living in Athens. Rectal swab cultures were reported negative for all of the members of the family except for the grandmother whose culture revealed three colonies of S. typhi, phage type C.

The 3-year-old child made an uneventful recovery and was discharged home on the 10th hospital day. Two of the adult family associates were in the restaurant business in another city, and the health officer there prohibited them from handling food until 3 rectal swab cultures were checked and found negative for S. typhi.

Editor's Comment: This case is rather characteristic of the experience with typhoid fever in this country at the present time. Between 400 and 500 cases of typhoid fever are reported each year, and most of these can be traced either to a carrier or to travel to a foreign endemic area. Older women are particularly likely to become long-term carriers after infection with S. typhi.

C. Pennsylvania:

Outbreak of Salmonella java Involving Multiple Household Pets.
Reported by Sylvan M. Fish, M.D., Chief, Communicable Disease Section, City of Philadelphia Department of Public Health.

A 2-year-old child became ill with severe diarrhea on January 9, 1966. She was hospitalized, and stool culture was positive for salmonella Group B. Other members of the family, two siblings and the child's parents, submitted stools for culture, and all were negative.

The child had been observed playing with a turtle given to the family the previous spring. In addition, there were 2 other family pets, a dog and a cat, which occasionally drank water from the turtle pond. Culture of the turtle and stool culture from the dog and cat were all positive for salmonella Group B. Serotyping of the 4 positive cultures was performed in the Pennsylvania State Laboratory and identified as S. java.

Editor's Comment: As pointed out in the author's report to the Salmonella Surveillance Unit, turtles have been implicated in many cases of salmonellosis in children. There is good evidence that baby turtles are infected at the breeding ponds, either transovarially or from the pond environment. Very little attention has been given to keeping the environment for breeding turtles free of salmonellae. Research on this problem is now being carried out on some turtle farms.

D. Washington:

1. Salmonella typhi-murium Infection Traced to Raw Milk.
Reported by Herb W. Anderson, R.S., Epidemiologic Assistant, and Donald R. Peterson, M.D., M.P.H., Director, Division of Epidemiology and Communicable Disease Control, Seattle-King County Department of Public Health.

On August 5, 1965, a family living in the Seattle area was visited by relatives who brought them a pound of homemade butter, a quart of raw cream, and a half gallon of raw milk. All of the milk was consumed by a 20-month-old male child in the family with the exception of a spoonful used by the mother in a cup of coffee. The boy's 1½-month-old sister and the father, who objected to drinking unpasteurized milk, did not drink the milk.

On August 7, the boy became ill with bloody diarrhea and a temperature of 105°F. A physician was consulted and a stool specimen was found to contain salmonella Group B. Unfortunately this culture was discarded and not available for subsequent serotyping. One week later, the sister developed fever of 103°F. and diarrhea. Stool specimens submitted to the Seattle-King County Health Department Laboratory yielded Salmonella typhi-murium upon culture. The mother and father of the children remained free of illness, and stool cultures were negative for salmonella.

The unwrapped package of homemade butter and unopened jar of raw cream were obtained from the home refrigerator, and S. typhi-murium was isolated from the raw cream. The salmonella found in the raw cream and in the stool specimen were identical on phage typing performed at the Communicable Disease Center, Atlanta, Georgia.

About 1 month after the episode, the ranch from which the products came was visited by a representative of the Washington State Health Department. Animals on the ranch included two milk cows, several calves, and pigs. It was learned that 3 calves had died during July and August; 1 calf developed "white scours" and died within a week. The sanitation practices observed in the care of livestock on the ranch were poor. A 17-month-old child visiting the ranch on the day of inspection was ill with diarrhea. The child drank pasteurized milk at home but consumed raw milk on the ranch prior to illness. Attempts were made to recover salmonellae from personnel and animals on the ranch, but these were not successful.

It seems reasonable to conclude that the ingestion of raw milk was responsible for the illness in these children.

2. Salmonella oranienburg Infection Traced to a Painted Turtle. Reported by Herbert W. Anderson, R. S., Epidemiologic Assistant, and Donald R. Peterson, M.D., M.P.H., Director, Division of Epidemiology and Communicable Disease Control, Seattle-King County Department of Public Health.

On July 21, 1965 a 5-year-old Seattle girl became ill with symptoms of abdominal pain, fever, and chills. Salmonella oranienburg was isolated on August 11 from the patient's stool. Other members of the family submitted stool specimens which were found to be negative.

A turtle had been given to the child a week prior to the onset of illness. When the child became ill, the mother immediately disposed of the pet turtle. She described the turtle shell as being painted red and having the inscription "Fisherman's Wharf, San Francisco."

The health department traced the painted turtle through 3 families to a Seattle tavern. The bartender recalled receiving the red painted turtle from a friend in San Francisco during the first week of June, at which time it was placed in the tavern's aquarium along with many other turtles. The tavern held weekly turtle races involving up to 150 turtles, some of which were brought in by customers and others supplied by the tavern. The painted turtle ran in several races and was held in the aquarium until July 1, when it was given to a customer. On August 13, 1965 a specimen of the turtle water was obtained from the aquarium which at that time contained approximately 40 turtles. Salmonella oranienburg was isolated from

this specimen.

The turtle races in the tavern were terminated as ordered by the health department.

V. SPECIAL REPORTS

Salmonella in Bird Faeces. Abstracted from an article by Gertrud Muller, Nature (London)207: 1315, 1965.

The contamination of German rivers and beaches with salmonellae from the disposal of domestic sewage is reported to be well known. Salmonellae in domestic sewage collected in the main drainage of the city of Hamburg occur at a density of 5,000 organisms per 1000 ml. of sewage. After flowing into the Elbe, these organisms are diluted but 50 to 100 organisms can be found in 1,000 ml. of river water.

To assess the role of birds in the contamination of surface water, more than 1,000 samples of the faecal material of gulls were taken in the area of the sewage disposal works of Hamburg, from bridges and pontoons in the port of Hamburg and in the streets of the city. Seventy-eight percent of the samples collected at the sewage disposal works were positive for salmonellae as compared to 66 percent of the samples collected in the port and 28 percent of the samples collected in the city. The most frequently isolated species was S. paratyphi B. The same serotype was the most common one cultured from sewer water. The faeces of gulls collected in regions where sewage was not present never contained salmonellae. One might therefore conclude that the salmonellae are not part of the normal bacterial flora in the gut of birds, but represent contact with a source of infection such as sewage.

In examining the faeces of other birds, the most striking fact was the great proportion of pigeons (30 percent) and ducks (16 percent) which harbored salmonellae while the faecal matter of thrushes (0.15 percent) and sparrows (0.2 percent) only occasionally showed a positive result. Birds kept indoors, such as canaries or parrots, were always negative for salmonella.

Editor's Comment: This report supports the impression that wild birds should not be thought of as the originators of salmonella infection. While on rare occasions these animals may serve as a vehicle of infection, they usually reflect the level of contamination of their environment. Similarly, a rat subsisting on the same feed as is being fed a poultry flock will probably excrete salmonellae, but it can hardly be accused of contaminating the flock.

VI. INTERNATIONAL

A. Australia:

Report of Isolations of Salmonellae From Human and Nonhuman Sources in South Australia - First Quarter 1966. Reported by Helen Kennedy, B.Sc., Salmonella Reference Laboratory, Institute of Medical and Veterinary Science, Adelaide, South Australia.

During the first quarter of 1966, 365 isolations of salmonella were typed in the Salmonella Reference Laboratory, an increase of 152 (71 percent) over the fourth quarter of 1965. Of the 365 isolations, 138 were made from human sources, 122 from animal sources and 105 from miscellaneous sources, including meat. The six most frequently isolated serotypes from humans are shown in the table on the following page:

Rank	Serotype	Number of Isolations	Per Cent
1	S. typhi-murium	75	54.4
2	S. chester	10	7.2
3	S. saint-paul	5	3.6
4	S. muenchen	5	3.6
5	S. typhi	4	2.9
6	S. adelaide	4	2.9

The most common nonhuman sources of salmonella isolations were meat and meat products, 81; cattle, 51; pigs, 40; and soil, 21.

B. Belgium:

Report of Isolations of Salmonella From Human Sources - First Quarter 1966. Reported by E. van Oye, M.D., National Salmonella and Shigella Center of Belgium.

During the first quarter of 1966, 380 isolations of salmonellae were typed from human sources. The five most common serotypes are shown in the table below:

Rank	Serotype	Number of Isolations	Per Cent
1	S. typhi-murium	247	65.0
2	S. panama	66	17.4
3	S. brandenburg	22	5.8
4	S. give	6	1.6
5	S. stanley	6	1.6

Salmonella fresno was isolated for the first time in Belgium during this quarter.

VII. FOOD AND FEED SURVEILLANCE

A. Progress Report on Pilot Food and Feed Surveillance Program:

In March 1966, the Food and Feed Surveillance Laboratory of the Veterinary Public Health Laboratory established a pilot food and feed sampling program for the detection of salmonellae, other enteric pathogens, and staphylococci. The program is being conducted with the cooperation of 9 state health departments and one city health department, representing all sections of the country. They submit 10 samples per week of the same designated food or feed product for examination. Selection of the products is made on the basis of foods frequently involved in outbreaks of human salmonella infection and new or suspect items as they appear. Findings will be reported periodically in this section of the Salmonella Surveillance Report.

Since March 31, 137 samples of nonfat dry milk, representing 26 brands, were examined, and no salmonellae or coagulase positive staphylococci were found.

Two hundred and forty samples of prepared, ready-to-eat meat, representing 49 brands, were examined for salmonellae, shigellae, Escherichia coli, and staphylococci. The samples included souse (head cheese), salami, liver cheese, pork roll, pork loaf, ham, bologna, and pepperoni. Four samples of head cheese were found to contain salmonellae. These included 2 S. typhi-murium var. copenhagen; 1 S. anatum; and 1 S. infantis. Coagulase positive staphylococci were isolated from 1 sample of pork roll, 1 sample of head cheese, and 2 samples of luncheon meat. Phage typing revealed phage types 7/47, 79 and 77. Typing has not

been completed on 1 strain. Escherichia coli was recovered from 11 head cheese samples. None of the samples were found to contain shigellae.

Figure 1.

REPORTED HUMAN ISOLATIONS OF SALMONELLA
IN THE UNITED STATES

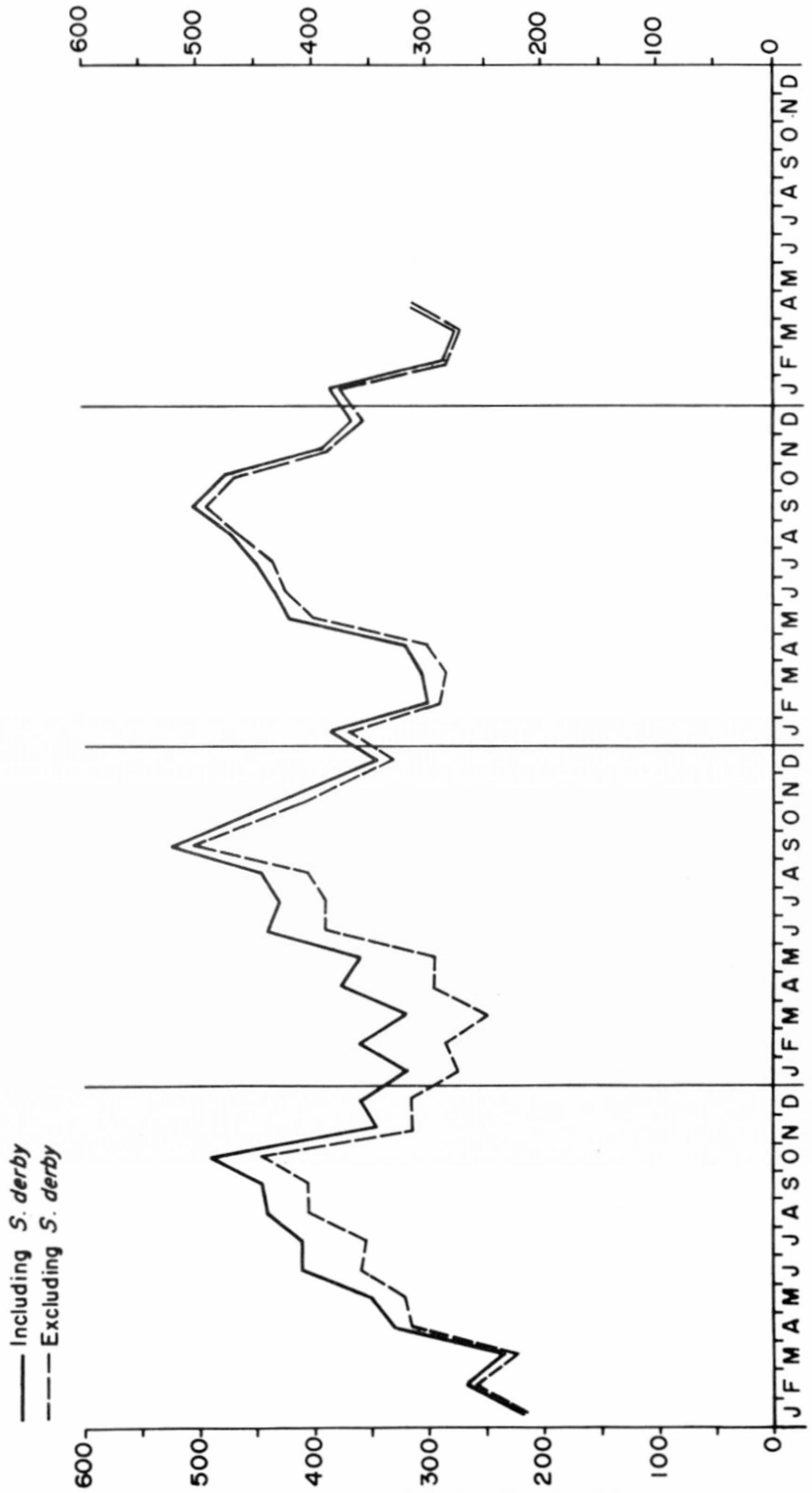
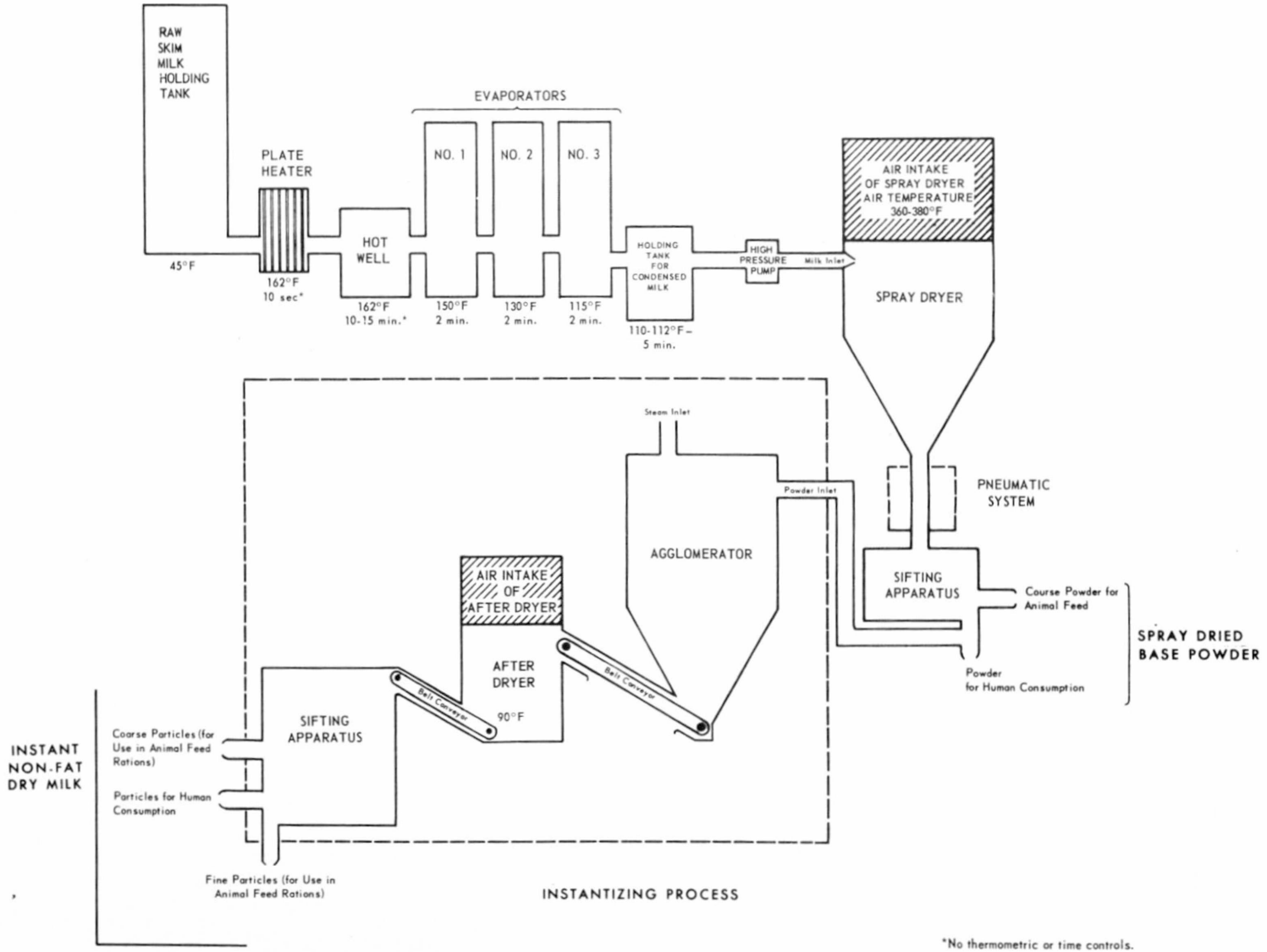


Figure 2

SCHEMATIC DIAGRAM OF A SKIM MILK DRYING AND INSTANTIZING PLANT



*No thermometric or time controls.

TABLE I
COMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS IN THE UNITED STATES DURING APRIL, 1966

SEROTYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																															SEROTYPE
	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL						WEST NORTH CENTRAL								SOUTH ATLANTIC								
	ME	NH	VT	MASS	RI	CONN	TOTAL	NY-A	NY-BI	NY-C	NJ	PA	TOTAL	OHIO	IND	ILL	MICH	WIS	TOTAL	MINN	IOWA	MO	ND	SD	NEBR	KAN	TOTAL	DEL	MD	DC	VA	WV	NC	SC	GA	FLA	TOTAL	
anatum				1			1		1				1	1					1			1					1					2		1	3	6	anatum
bareilly																																		1		1	bareilly
berta																												2							2	berta
blockley				3			3	2	1	3	1	5	12	1		4	1		6			2					2					1		2	3	6	blockley
braenderup				1			1									1			1	3							3										braenderup
bredeney				2		1	3										1		1															1		1	bredeney
chester						1	1										1		1	2							2										chester
cholerae-suis v kun																1			1									1							1	2	cholerae-suis v kun
cubana				5			5	6				1	7	1					1									2		1				1	4	cubana
derby				2			2	1	3				4	1		3	1	1	6																		derby
enteritidis				17		2	19	4		3	3	1	11	3	1	3	2	1	10		1					1		1	2	3			2	9	17	enteritidis
give				1			1																												1	1	give
heidelberg				6		1	7	4	7	9	3	2	25	16	1	8	7		32		4	1					5	1	3	3	4		1		2	5	19	heidelberg
indiana												4	4																						2	2	indiana
infantis				17		2	19	10		2	5	8	25		1	4	6		11		1	4					5		8		3		2		5	5	23	infantis
java								1					1		1			1	2	1		3					4		1						2	3	java
javiana																										2	2								1	1	javiana
kentucky									1				1																								kentucky
litchfield																1			1	1							1										litchfield
livingstone														1					1																		livingstone
manhattan														1					1																		manhattan
meleagridis																																					meleagridis
miami																																			2	2	miami
mississippi																																					mississippi
montevideo					1	1	2		1	1	1	1	4	1		1	2		4	1	1						2	1			1		2		1	4	9	montevideo
muenchen				2			2			1			1				3	1	4																1	1	muenchen
newington																		1	1																1	1	newington
newport				1			1		2	3	1	1	7	6		4	1	1	12	1		2					3		1					1	17	19	newport
oranienburg				5		1	6	2		2		1	5	2			1	1	4	1						3	4							1	3	4	oranienburg
panama	2			7	1	3	13		1	1			2																								panama
paratyphi B	1			3			4		1	1			2																1		1				1	3	paratyphi B
poona															1				1																		poona
saint-paul	4			1		1	6	1		1	1	6	9		1	2		1	4	2		3				1	6		1					1	2	saint-paul
san-diego									1				1																								san-diego
schwarzengrund	1						1								1				1																2	2	schwarzengrund
senftenberg																															1					1	senftenberg
tennessee									1				1				3		3			1				1											tennessee
thompson								3		1		1	5	2		2	2	26	32					1		1											thompson
typhi	1					1	2			4	3		7	1	1	1		2	5		1	1				1	3		1			1			4	5	typhi
typhi-murium	1			22	3	3	29	28	14	26	7	19	94	5	2	22	9	2	40	9	3	1	1			5	19		8	1	4		3		15	22	53	typhi-murium
typhi-murium v cop				4		2	6					5	5				1		1																		typhi-murium v cop
urbana																																					urbana
weltevreden																																					weltevreden
worthington														2					2			1				1											worthington
untypable, group B		2					2														1						1			2						2	untypable, group B
untypable, group C1																							1				1										untypable, group C1
untypable, group C2		1					1																							1						1	untypable, group C2
untypable, group D																														2						2	untypable, group D
untypable, group E																					1						1										untypable, group E
untypable or unknown		5					5											2	2											1						1	untypable or unknown
Total Common	10	8	-0-	100	5	19	142	62	34	58	30	50	234	44	10	57	41	40	192	21	13	20	2	1	-0-	12	69	4	27	11	18	-0-	13	-0-	32	91	196	Total Common
Total Uncommon	-0-	-0-	-0-	1	-0-	-0-	1	1	-0-	-0-	-0-	1	2	-0-	-0-	1	-0-	1	2	2	-0-	-0-	-0-	-0-	-0-	-0-	2	-0-	1	-0-	1	-0-	-0-	-0-	2	1	5	Total Uncommon
Grand Total	10	8	-0-	101	5	19	143	63	34	58	30	51	236	44	10	58	41	41	194	23	13	20	2	1	-0-	12	71	4	28	11	19	-0-	13	-0-	34	92	201	Grand Total

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 116 isolations for April.

TABLE I (Continued)
COMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS IN THE UNITED STATES DURING APRIL, 1966

SEROTYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																							TOTAL	PERCENT OF TOTAL	1966 CUM. TOTAL	PERCENT 1966 CUM. TOTAL	1965 CUM. TOTAL	PERCENT 1965 CUM. TOTAL	SEROTYPE
	EAST SOUTH CENTRAL					WEST SOUTH CENTRAL					MOUNTAIN									PACIFIC					OTHER						
	KY	TENN	ALA	MISS	TOTAL	ARK	LA	OKLA	TEX	TOTAL	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOTAL	WASH	ORE	CAL	ALAS	HAI	TOTAL	VI						
anatum							2		1	3		1							1			3		1	4		18	1.4	92	1.7	86	1.6	anatum
bareilly								1		1																	2	.2	14	.3	19		bareilly
berta												1							1								3	.2	15	.3	10		berta
blockley							1		1	2												12		2	14		45	3.5	141	2.6	106		blockley
braenderup																						1			1		6	.5	36	.7	23		braenderup
bredeney			1		1		3			3				1					1			1		1	1		11	.9	39	.7	44		bredeney
chester																1			1			1			1		6	.5	31	.6	52		chester
cholerae-suis v kun																											3	.2	10	.2	12		cholerae-suis v kun
cubana																5			5			1			1		23	1.8	67	1.2	59		cubana
derby							1			1						1			1			2	1	2	5		19	1.5	93	1.7	242	4.4	derby
enteritidis														1			3		4			1			1		63	5.0	322	6.0	291	5.3	enteritidis
give																											2	.2	24	.5	31		give
heidelberg	1	4			5		2			2				2		1	2	4	9		2	28		1	31		135	10.6	414	7.8	440	8.0	heidelberg
indiana																											6	.5	26	.5	15		indiana
infantis		1			1	1	1	3	4	9				5		2			7			14		3	17		117	9.2	489	9.2	322	5.8	infantis
java							1			1																	11	.9	46	.9	49		java
javiana									2	2																	5	.4	49	.9	37		javiana
kentucky																											1	.1	5	.1	4		kentucky
litchfield																						3			3		5	.4	19	.4	34		litchfield
livingstone																											1	.1	10	.2	13		livingstone
manhattan																								1	1		2	.2	30	.7	35		manhattan
meleagridis																											3	.1	5				meleagridis
miami																											2	.2	18	.3	23		miami
mississippi																													8	.2	7		mississippi
montevideo		2			2		7			7												2			2		32	2.4	103	1.9	148	2.7	montevideo
muenchen																						2			2		10	.8	54	1.0	52	0.9	muenchen
newington																											2	.2	8	.2	16		newington
newport		3			3	1	5	2	6	14												11		4	15		74	5.8	314	5.9	254	4.6	newport
oranienburg															1		14		15			2			2		40	3.2	149	2.8	185	3.3	oranienburg
panama									1	1					1			1	2	1	1				2		20	1.6	62	1.2	38		panama
paratyphi B								1	6	7																	16	1.2	47	.9	54		paratyphi B
poona																						2			2		3	.2	16	.3	14		poona
saint-paul		1			1	1	6		1	8				3					3		7	8			15		54	4.3	185	3.5	207	3.8	saint-paul
san-diego																	1		1		2	4			6		8	.6	29	.5	112		san-diego
schwarzengrund																						2			2		6	.5	19	.4	50		schwarzengrund
senftenberg																											1	.1	18	.3	20		senftenberg
tennessee							2			2		1		1					2			2			2		11	.9	37	.7	70	1.3	tennessee
thompson							1		1	2				1					1		1	3			4		45	3.5	161	3.0	127	2.3	thompson
typhi		4			4	4	3			7					1			1	2		2	2		2	6		41	3.2	207	3.9	263	4.8	typhi
typhi-murium	2				2		7	8	12	27	2	3		8			2		15	4	2	39		5	50		329	26.0	1,498	28.2	1,591	28.8	typhi-murium
typhi-murium v cop							3		3	6																	18	1.4	47	.9	64		typhi-murium v cop
urbana									2	2																	2	.2	5	.1	3		urbana
weltevreden																								2	2		2	.2	5	.1	10		weltevreden
worthington									1	1														1	1		5	.4	17	.3	15		worthington
untypable, group B						1				1					1				1		2		3		5		12	.9	81	1.5	71		untypable, group B
untypable, group C1						4	1			5					3				3								9	.7	39	.7	25		untypable, group C1
untypable, group C2																											2	.2	9	.2	22		untypable, group C2
untypable, group D															1				1				1		1		4	.3	12	.2	8		untypable, group D
untypable, group E						1				1																	2	.2	5	.1	2		untypable, group E
untypable or unknown																											8	.6	29	.5	36		untypable or unknown
Total Common	3	15	1	-0-	19	13	46	15	41	115	2	6	-0-	24	6	24	9	5	76	5	19	145	5	25	199	-0-	1,242	98.1	5,157	96.9			Total Common
Total Uncommon	-0-	-0-	-0-	-0-	-0-	-0-	2	-0-	1	3	-0-	-0-	-0-	-0-	-0-	1	-0-	-0-	1	2	-0-	4	-0-	2	8	-0-	24	1.9	163	3.1			Total Uncommon
Grand Total	3	15	1	-0-	19	13	48	15	42	118	2	6	-0-	24	6	25	9	5	77	7	19	149	5	27	207	-0-	1,266	100.0	5,320	100.0	5,525		Grand Total

TABLE II

UNCOMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING 1966

SEROTYPE	REPORTING CENTER																												
	ALA	ALAS	ARI	ARK	CALIF	COLO	CONN	DEL	DC	FLA	GA	HAI	IDA	ILL	IND	IOWA	KAN	KY	LA	ME	MD	MASS	MICH	MINN	MISS	MO	MONT	NEBR	NEV	NH	NJ	NM
abortus-bovis														2					1													
alachua										2												1		1								
albany																										1						
austin																																
ball					2																											
binza										1									1					1								
bonaire					1																											
bovis-morbificans																			1													
bradford						1											1															
brandenburg											1																					
california					1						1			1					3													
carrau																																
cerro												2		1																		
cholerae-suis						1																1										
colorado																			1													
duesseldorf					1														2													
duisburg																																
eimsbuettel																																
fayed																																
gaminara																			1													
garoli																					1											
glostrup																																
grumpensis																																
hartford										2	1								1													
inverness																							1									
kaapstad						1																										
lanka					1												1															
menston																																
minnesota																1																
mission										1																						
mjimwema																																
molade																																
muenster			1							2				1																		
new-brunswick					1		2			2	2												1									
norwich				1						1																						
ohio					4																											
oritamerin																																
os																			3													
oslo					1							5																				
paratyphi A					1																											
paratyphi C						1													1													
pomona																			1													
pullorum														9					1													
reading			1		4									14													1					
rubislaw					2														1			1									
siegburg					2																	1									
simsbury														1																		
stanley														1																		
virchow																							3									
wassenaar																			1													
westerstede																																
untypable, group G																																1
untypable, group O					2					1																						
Total	-0-	-0-	2	1	23	4	2	-0-	-0-	12	5	7	-0-	30	-0-	1	2	-0-	18	-0-	1	4	5	2	-0-	1	1	-0-	-0-	-0-	-0-	1

TABLE II (Continued)
UNCOMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING 1966

REPORTING CENTER																					APRIL TOTAL	1966 CUM. TOTAL	MONTH LAST REPORTED	STATE LAST REPORTED	TOTAL PREVIOUSLY REPORTED TO SAL. SURV. UNIT 1962 - 1965	SEROTYPE
NY-A	NY-BI	NY-C	NC	ND	OHIO	OKLA	ORE	PA	RI	SC	SD	TENN	TEX	UTAH	VT	VA	VI	WASH	WV	WIS	WYO						
		1																					2	Jan 66	Ill	0	abortus-bovis
																							2	Mar 66	NYC	21	alachua
																						1	4	Mar 66	Mass-Fla	15	albany
																							1	Feb 66	Mo	0	austin
																							2	Jan 66	Cal	0	ball
1																						2	4	Mar 66	La-NYA	54	binza
																						1	1	*	*	0	bonaire
1																							2	Feb 66	NYA-La	44	bovis-morbificans
																							2	Feb 66	Colo	2	bradford
																						1	1	Jun 65	Ill	10	brandenburg
																						1	3	Mar 66	Cal-Ind	64	california
																							3	Jan 66	La	12	carrau
													1									1	4	Feb 66	Tex-Hai	28	cerro
	2				1																	1	5	Mar 66	Ohio-Colo NY-BI	61	cholerae-suis
																							1	Feb 66	La	8	colorado
		1																2					4	Feb 66	NYC	7	duesseldorf
1												1											2	Feb 66	Wash	1	duisburg
			5																				2	Feb 66	Tenn	3	eimsbuettel
																							5	Mar 66	NC	6	fayed
																							1	Jan 66	La	20	gaminara
		1																					1	Mar 66	NYC	0	garoli
																						1	1	Jul 65	La	1	glostrup
																1						1	1	Dec 64	Mich	11	grumpensis
						1														1		1	6	Mar 66	Ohio-La Ga-Fla	90	hartford
																							1	Feb 66	Mich	13	inverness
																							1	Mar 66	Colo	3	kaapstad
																						1	1	*	*	0	lanka
													1										1	Jan 66	Kan	14	menston
												2											2	Mar 66	Iowa	40	minnesota
																							3	Mar 66	Fla	7	mission
1																				1			1	Jan 66	NYA	0	mjimwema
																							1	Feb 66	Wisc	0	molade
								1										3				1	4	Jan 66	Fla-Ill	26	muenster
																						3	12	Mar 66	Wash-Ga Fla	32	new-brunswick
		1			1							1											5	Mar 66	NYC-Ohio	51	norwich
					1																		5	Mar 66	Cal-Ohio	13	ohio
		1																					1	Mar 66	NYC	0	oritamerin
																							3	Mar 66	La	0	os
																						1	6	Feb 66	Hai	15	oslo
																						1	1	Nov 65	NYC	34	paratyphi A
						1																	2	Mar 66	Okla-Colo	7	paratyphi C
																						1	1	Dec 65	Ariz	4	pomona
1						1																	10	Mar 66	La	4	pullorum
																						2	22	Mar 66	Ore-Cal Ariz	102	reading
																							4	Mar 66	La	42	rubislaw
													2									1	5	Feb 66	Tex	19	siegburg
																						1	1	Dec 65	NYA-Calif	16	simsbury
																							1	Jan 66	Ill	26	stanley
																							3	Mar 66	Mich	16	virchow
																						1	1	*	*	0	wassenaar
		1																					1	Mar 66	NYC	5	westerstede
																							2	Mar 66	NM		untypable, group G
																							2	Jan 66	Cal		untypable, group O
5	2	6	5	-0-	3	3	-0-	1	-0-	-0-	-0-	4	4	-0-	-0-	1	-0-	5	-0-	2	-0-	24	163				Total

*Not previously reported

TABLE III

Age and Sex Distribution of Persons Reported as Harboring Salmonellae During April 1966

Age (Years)	Male	Female	Unknown	Total	%	Cumulative %
Under 1	88	60	2	150	17.7	17.7
1 - 4	122	99		221	26.1	43.8
5 - 9	61	54	1	116	13.7	57.6
10 - 19	25	32		57	6.7	64.3
20 - 29	19	45		64	7.6	71.9
30 - 39	24	31		55	6.5	78.4
40 - 49	24	24		48	5.6	84.0
50 - 59	23	27		50	5.9	89.9
60 - 69	18	20		38	4.5	94.4
70 - 79	13	15		28	3.3	97.7
80 +	9	10		19	2.2	99.9
Child (Unspec.)	9	7	5	21		
Adult (Unspec.)	5	16	2	23		
Unknown	168	185	23	376		
Total	608	625	33	1266		
% of Total	49.3	50.7				

TABLE IV
REPORTED NONHUMAN ISOLATES BY SEROTYPE AND SOURCE, *APRIL, 1966

SEROTYPE	chicken	turkey	duck	pigeon	parrot	goose	sparrow	avain	equine	bovine	ovine	porcine	canine	lab mouse	lab rat	squirrel	beaver	animal, unknown	egg	powdered egg	frozen egg	pork steak	dry milk	dry milk products	noodles	creamed corn	yeast	livestock feed	bone meal/ meat scraps	animal feed unknown	cooked blood & feathers	turtle	snake	sewage	turtle water	turtle tank	stuffed easter ducks & chicks	unknown	Total	4 mos. Total	SEROTYPE
alachua																				1																			1	10	alachua
anatum	3	3	3										1															2		4			1				1		18	113	anatum
bareilly	1	1																										1											3	5	bareilly
binza	2																											3	1		1							7	23	binza
blockley	1	4										1																											6	72	blockley
braenderup	1																																					1	10	braenderup
bredeney	2																													3								5	22	bredeney
california		1																												1								2	9	california
cambridge																												1										1	1	cambridge
carrau																																2						2	2	carrau
cerro	1																											1	1		1							4	27	cerro
chester		10																																1				11	29	chester
cholerae-suis v kun												5																										5	40	cholerae-suis v kun
corvallis																												1										1	1	corvallis
cubana	1																											2										3	28	cubana
derby		3								1	1																	2		2								9	59	derby
dublin										11																												11	26	dublin
eimsbuettal	2																											1										3	16	eimsbuettal
enteritidis	2											1		1	1																			1				6	27	enteritidis
fayed													1															1										2	2	fayed
give		2																										1								3		6	21	give
habana																															1							1	1	habana
heidelberg	27	22										1							4						2												1	57	223	heidelberg
indiana		1																																				1	18	indiana
infantis	18	1				1				1		1	1											1	3									1				28	115	infantis
litchfield																																					1	1	1	litchfield
livingstone		1								1																		2		6								10	44	livingstone
manhattan	2	3																												1								6	23	manhattan
manila																															1							1	2	manila
meleagridis																1																						1	7	meleagridis
minnesota		2																										3		2								7	21	minnesota
montevideo	12	2	3																						1			4		2	1							25	112	montevideo
muenchen																		1										2				1		1				5	13	muenchen
muenster	1	1																										3										5	9	muenster
new-brunswick																							10															10	11	new-brunswick
newington	3	2																			1																	6	35	newington
newport	3	2																													1			3	1			10	43	newport
oranienburg		1																									1	2		5								9	72	oranienburg
panama		1																														1						1	4	panama
paratyphi-B																																1						1	3	paratyphi-B
pullorum	4											1		1																								6	24	pullorum
reading																									4													4	10	reading
saint-paul	3	2																		1														1				7	121	saint-paul
san-diego	1	11																																1				13	52	san-diego
schwarzengrund	3	5																											1		1						1	11	34	schwarzengrund
senftenberg		5																		1								4	2	1								13	64	senftenberg
taksony																															1							1	2	taksony
tennessee	2																			1								1										4	36	tennessee
thomasville																												1										1	5	thomasville
thompson	4							3																						1		1						9	64	thompson
typhi-murium	10	7		1			2			16	1				1		2				1				1			2		1								45	295	typhi-murium
typhi-murium v cop	9	1			1				1	3																												15	87	typhi-murium v cop
urbana																																2						2	3	urbana
vejle																												1										1	1	vejle
worthington																												3			1							4	17	worthington
untypable group O																												1										1	1	untypable group O
untypable																																		1				1	1	untypable
unknown		1																			1				2			1				1						6	7	unknown
Total	118	95	6	1	1	1	2	3	1	33	2	10	3	2	2	1	2	1	4	4	7	1	10	1	12	1	1	46	5	29	8	6	4	2	8	1	4	3	436	2,237	Total

Source: National Disease Laboratory, Ames, Iowa, weekly Salmonella Reports from individual States and US-FDA-Division of Microbiology, Washington, D.C.

*Includes March late reports.

TABLE V

REPORTED NONHUMAN ISOLATES BY SEROTYPE AND STATE, *APRIL, 1966

SEROTYPE	Ala	Ariz	Ark	Cal	Colo	Conn	Del	Fla	Ga	Ida	Ill	Ind	Iowa	Kan	La	Md	Mass	Mich	Minn	Miss	Mo	Mont	Neb	NH	NJ	NC	Ohio	Ore	Pa	SC	SD	Tenn	Tex	Utah	Vt	Va	Wash	WVa	Wisc	Total	4 Mos. Total	SEROTYPE
alachua				1																																			1	10	alachua
anatum				1				1							3	6	1										4								2				18	113	anatum
bareilly				1								1			1																								3	5	bareilly
binza								1			2				3	1																							7	23	binza
blockley				4																																		2	6	72	blockley
braenderup						1																																	1	10	braenderup
bredeney											4														1		1												5	22	bredeney
california					1																			1														2	9	california
cambridge															1																							1	1	cambridge
carrau																	2																					2	2	carrau
cerro									1			1			1	1			1																			4	27	cerro
chester						1						1	1						4																2			11	29	chester
cholerae-suis v kun												2			1										2													5	40	cholerae-suis v kun
corvallis															1																							1	1	covallis
cubana				1											2																							3	28	cubana
derby		1		4											2												2											9	59	derby
dublin				9																													2					11	26	dublin
eimsbuettal											1				1												1											3	16	eimsbuettal
enteritidis						1	1					2																1						1					6	27	enteritidis
fayed															1											1													2	2	fayed
give				1											1	3																						1	6	21	give
habana																1																							1	1	habana
heidelberg	5			14					5			10				11			1				1			1	1	2						4				2	57	223	heidelberg
indiana												1																											1	18	indiana
infantis	1		1	9					1		4			1		1		1			4	1				1		2						1					28	115	infantis
litchfield				1																																			1	1	litchfield
livingstone															2												8												10	44	livingstone
manhattan				5																							1												6	23	manhattan
manila																1																							1	2	manila
meleagridis				1																																			1	7	meleagridis
minnesota				2											3										2														7	21	minnesota
montevideo									2		1				4	10				1	1					1	2		2			1							25	112	montevideo
muenchen														1	3	1																							5	13	muenchen
muenster				1					1						3																								5	9	muenster
new-brunswick												10																											10	11	new-brunswick
newington				3	1			1											1								1												6	35	newington
newport				3														3		3							1												10	43	newport
oranienburg											1				2										1		5												9	72	oranienburg
panama																																						1	1	4	panama
paratyphi-B																											1												1	3	paratyphi-B
pullorum																			1		1		1							1					1	1		6	24	pullorum
reading																												4											4	10	reading
saint-paul			1	2					1			1							1		1																		7	121	saint-paul
san-diego				11																	1									1									13	52	san-diego
schwarzengrund				3								5				1			1															1					11	34	schwarzengrund
senftenberg												1			4				6								1				1							13	64	senftenberg
taksony																1																							1	2	taksony
tennessee									2			1			1																								4	36	tennessee
thomasville															1																								1	5	thomasville
thompson				4									1					1									1									2			9	64	thompson
typhi-murium				16	1				2			3			2	6			3		1			1	1		3	1					1	3		1			45	295	typhi-murium
typhi-murium v cop				2		2			5	1		1							2															2				15	87	typhi-murium v cop
urbana															1														1										2	3	urbana
vejle															1																								1	1	vejle
worthington															3	1																								4	17	worthington
untypable group O															1																								1	1	untypable group O
untypable				1																																			1	1	untypable
unknown									1						1			1			2																		6	7	unknown
Total	6	1	2	100	3	5	1	3	21	1	13	40	2	2	50	45	3	6	21	4	11	1	2	1	5	6	32	9	2	4	1	1	1	14	1	5	3	1	7	436	2,237	Total

Source: National Disease Laboratory, Ames, Iowa, weekly Salmonella Reports from individual States and US-FDA-Division of Microbiology, Washington, D.C.

*Includes March late reports.

TABLE V-A
OTHER SEROTYPES REPORTED DURING 1966 FROM NONHUMAN SOURCES

SEROTYPE	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
abortus-bovis	Mar	La	1
adelaide	Mar	La	1
alagbon	Mar	NJ	2
amsterdam	Jan	Ohio	1
babelsberg	Jan	Ind	1
berta	Feb	Ga	2
bovis-morbificans	Jan	Cal	1
bradford	Jan	NJ	1
caracus	Mar	La	1
champaign	Mar	La	2
cholerae-suis	Feb	Cal	1
colorado	Mar	NJ	1
eppendorf	Jan	NJ	1
gallinarum	Jan-Mar	Tex(2)	
	Feb	Cal(1)	
	Feb	Minn(1)	
	Feb	Pa(2)	
	Feb	Wisc(1)	
	Mar	Va(1)	8
grumpensis	Mar	La	1
halmstad	Mar	La	3
hamilton	Jan	La	1
hartford	Mar	Fla	1
illinois	Mar	Minn	1
java	Jan-Feb-Mar	Cal(6)	
	Jan	Fla(1)	
	Jan	Ill(1)	
	Feb-Mar	Pa(4)	
	Mar	Conn(3)	15
johannesburg	Mar	Mich	1
kaapstad	Mar	La	1
kentucky	Jan	Iowa(1)	
	Feb	Ill(1)	
	Feb-Mar	Minn(6)	
	Mar	NJ(1)	
	Mar	Wisc(1)	10
kottbus	Feb	Ga	1
lexington	Jan	Calif(1)	
	Mar	La(1)	
	Mar	NJ(2)	4
lille	Mar	NJ	1
manila	Jan	Ind	1
miami	Feb	Calif(1)	
	Feb	Tex(1)	2
mission	Mar	Ohio	1
mississippi	Mar	La	1
new-haw	Mar	NJ	1
ohio	Feb	Iowa(7)	
	Feb	Minn(1)	8
orion	Jan	Miss(4)	
	Jan	Ohio(1)	
	Feb	Wisc(2)	
	Mar	Ill(1)	8
oslo	Jan-Mar	Calif	2
pharr	Jan	Mich	1
pomona	Mar	NJ	1
poona	Mar	Calif(2)	
	Mar	Md(1)	3
siegburg	Feb	Mich	2
simsbury	Jan	Ind(1)	
	Feb-Mar	Calif(2)	
	Mar	NJ(1)	4
tournai	Mar	NJ	1
tuebinger	Jan	Mich	1
typhi	Jan	Mo	1
typhi-suis	Feb-Mar	Calif(6)	
	Mar	Minn(1)	7
westhampton	Mar	Kan	1
Total			110

TABLE VI

SUPPLEMENTARY QUESTIONNAIRE

The Communicable Disease Center of the United States Public Health Service recently advised local Public Health agencies of a rise in isolations of Salmonella infantis from humans during the last week of February and the first 2 weeks of March 1966 in a 25 state area. This rise includes New York State. The explanation offered for the increase is a common vehicle of infection such as a commercially prepared food distributed nationally. In order to clarify the epidemiology, the Bureau of Preventable Diseases will survey the potential sources of infection in all reported cases of Salmonella infantis. We have to search for a food that is not brought to a high temperature, either in processing, or at home before serving.

Patient's Name_____ Date of Onset_____

Address_____

Does patient eat any of the foods listed?

Food	Regularly	Occasionally	Never
Shellfish			
Ice cream			
Turkey roll			
Desert mix			
Cake mix			
Processed meat(sausage or smoked ham)			
Powdered milk			
Powdered eggs			
Frozen or liquid eggs			
Commercially prepared dressing(dessert)			
Other food not heated (commercially or at home)			

If the answer is regularly, or occasionally, please record the brand name of the product and where it was purchased.