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NATIONAL
COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

CONTENTS. . .

FOR THE MONTH OF DECEMBER 1968

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

PREFACE

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

Contributions to the Surveillance Report are most welcome. Please address

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I. SUMMARY

This issue of the Salmonella Surveillance Report includes reports of two foodborne outbreaks of salmonellosis.

In December 1968, 1,408 isolations of salmonellae were reported from humans, an average of 352 isolations per week (Tables I, II, and V-A). This number represents a decrease of 62 (15.0 percent) from the weekly average of November 1968 and an increase of 10 (2.9 percent) over the weekly average of December 1967.

Reports of 350 nonhuman isolations of salmonellae were received during December 1968 (Tables III, IV, and V-B).

II. REPORTS OF ISOLATIONS

The ten most frequently reported serotypes during December:

HUMAN				NONHUMAN		
	Serotype	Number	Percent	Rank Last Month	Serotype	Number	Percent
1	typhi-murium*	415	29.5	1	typhi-murium*	77	22.0
2	enteritidis	152	10.8	2	saint-paul	39	11.1
3	newport	96	6.8	3	heidelberg	37	10.6
4	heidelberg	89	6.3	5	cholerae-suis var. kunzendorf	16	4.6
5	saint-paul	56	4.0	4	infantis	16	4.6
6	infantis	54	3.8	6	enteritidis	15	4.3
7	thompson	51	3.6	7	thompson	14	4.0
8	javiana	39	2.8	8	derby	10	2.9
9	reading	35	2.5	>10	blockley	9	2.6
10	typhi	35	2.5	9	montevideo	8	2.3
					newport	8	2.3
	Total	1,022	72.6		Total	249	71.1
	TOTAL (all serotypes)	1,408			TOTAL (all serotypes)	350	
	*Includes var. copenhagen	20	1.4		*Includes var. copenhagen	20	5.7

A large part of the increase in Salmonella reading isolations resulted from a foodborne outbreak in the State of Washington reported in this issue.

III. CURRENT INVESTIGATIONS

NONE

IV. REPORTS FROM THE STATES

A. Colorado - Salmonellosis Outbreak on a Fishing Trip

Reported by C. S. Mollohan, M.D., State Epidemiologist, Colorado State Department of Public Health, and John C. Breckinridge, M.D., EIS Officer located at the Colorado State Department of Public Health.

On September 7-8, 1968, an outbreak of salmonellosis occurred among 37 persons on a 3-day fishing trip in Glenwood Springs, Colorado. Of 34 persons contacted, 23 (68 percent) had experienced a gastrointestinal illness. Symptoms included diarrhea (100 percent), abdominal cramps (87 percent), nausea (65 percent), vomiting (36 percent), and fever (36 percent). Recovery in all cases was uneventful. Stool cultures were obtained following recovery from four patients. Of these, two were positive for Salmonella group E (not further identified) and two yielded no pathogens.

The suspect meal was a box lunch prepared by a local hotel and eaten on September 7. Onset of illness ranged from 6 to 28 hours following consumption of the lunch with a mean onset of 16-18 hours. The lunch consisted of a plain ham sandwich and a plain beef sandwich (without butter or mayonnaise), celery, a pickle, a carrot, two cookies, and an orange. Sandwiches had been made on the evening of September 6, refrigerated until 4:00 am September 7, and then put in the hotel lobby to be taken by the fishermen. The sandwiches remained unrefrigerated until eaten at approximately 12:00 noon. Because nearly everyone consumed all items in the lunch, no single food item could be implicated by food histories. However, a leftover ham sandwich was obtained for culture on October 30 and was positive for Salmonella orion (a group E salmonella).

The box lunches had been made by three hotel employees. Stool cultures were obtained from each and one was positive for S. orion. This man had experienced no symptoms. He was known as the employee who "finished off" any leftovers and had eaten several leftover ham and beef sandwiches. Inspection of the kitchen by the local sanitarian revealed no break in proper food handling. Multiple cultures taken in the environment of the kitchen following the outbreak were negative for salmonella.

Two additional cases of salmonellosis due to S. orion were subsequently traced to the same hotel. The first was a 44-year-old lady who often ate lunch at the hotel. She usually had beef sandwiches but never ham. The other was a 68-year-old man who had ham and eggs for breakfast in the hotel shortly before becoming ill.

In summary, this outbreak of salmonellosis could not be traced to a specific food vehicle. Although a ham sandwich was implicated bacteriologically, two patients had not consumed ham. It is possible that the ham was contaminated prior to its use for sandwiches, and contamination spread from it through the environment of the kitchen to other foods. It is also quite possible that another food item such as the beef was the original source of S. orion and the ham was contaminated secondarily. Finally, it is also possible that the food handler involved was a salmonella carrier who introduced the organism into the environment. None of these three hypotheses can be excluded.

B. Washington - An Outbreak of Salmonellosis Due to Precooked Turkey Roast

Reported by Byron J. Francis, M.D., Chief, Division of Epidemiology, Washington State Department of Health; John G. Girard, Section Head, Carl Sagerser, Advisory Sanitarian, and Wayne Brisbane, Advisory Sanitarian, Food Protection Section, Washington State Department of Health; Kenneth Fry, M.D., Walla Walla County Health Officer; and Robert S. Thompson, M.D., EIS Officer located at the Washington State Department of Health.

An outbreak of salmonellosis occurred among 42 persons who attended a company banquet held on November 22, 1968 in Walla Walla, Washington. Of those attending the banquet, 33 (79 percent) subsequently became ill with symptoms of febrile gastroenteritis. Onset of illness occurred from 13 to 52 hours following the banquet, with a mean of 25 hours. Four patients required hospitalization. Duration of illness ranged from one day to greater than 16 days with a mean duration of 5 days. Stool specimens were obtained from all those ill; 26 were positive for Salmonella reading.

The banquet meal, served at a local motel, included sliced baked turkey, giblet gravy, dressing, whipped potatoes, frozen peas, dressed tossed salad, and pumpkin pie. Since everyone at the banquet ate nearly everything served, food histories were of no value in implicating a specific food item. However, five persons with positive stool cultures had not eaten the pumpkin pie, and this food item was therefore eliminated as a possible vehicle.

The sliced turkey served was prepared from boneless, pre-baked turkey roasts weighing approximately 5-6 pounds each. Six roasts were thawed at 40°F on November 21. At 3:00 pm on November 22, they were placed in the oven at 350°F for one hour. They were then put onto a steam table set to maintain a temperature of 140°-160°F until they were sliced and served at 6:30 pm. As preparation for the banquet progressed, it was felt that six roasts would not be adequate, and so two additional roasts were partially thawed, sliced and heated in an oven at 350°F for 5 minutes prior to serving. A study of the preparation of the other food items served at the banquet did not suggest that any one of these would have been a likely vehicle for salmonellosis. None of the food items served was available for culture. The turkey roasts had come from one of five specific lots. A total of five samples from three of these lots were obtained for culture and were negative for salmonella.

An inspection of the kitchen facilities was performed. Sixteen environmental swabs were taken for culture during the course of this inspection and were negative for salmonella. Motel personnel involved with food preparation were interviewed, and stool cultures were obtained. None gave a history compatible with previous gastroenteritis and none had been ill following the banquet. However, one employee was found infected with S. reading. She was a hostess who had no contact with either food or the kitchen. On the evening of the banquet, the only food she consumed in the motel was sliced turkey.

In cooperation with Dr. John E. Spaulding, Head, Toxicology Group, Consumer and Marketing Service, United States Department of Agriculture, an inspection of the turkey processing plant was undertaken. Turkeys were slaughtered and processed in the usual fashion and deboned by hand. Roasts were prepared, packed in impervious plastic bags by the "Cryovac" process and cooked for 8-9 hours to an internal temperature of 160°F. After cooking, finished roasts were returned to a table on which they had been held prior to cooking. After cooling down, the cooked roasts were frozen. As a part of the inspection, environmental cultures were obtained. Of 80 swabs cultured, five yielded S. reading, including three from uncooked meat and two from the plant environment. Five additional swabs from the plant environment were positive, including two positive for S. heidelberg and three positive for group B salmonella (not further typed).

EDITOR'S COMMENT: It is very likely that turkey was the vehicle responsible for this outbreak. Several facts make this a valid conclusion. First, the serotype involved, S. reading, is one frequently associated with turkeys. Of 100 isolations of S. reading from nonhuman sources reported in 1967, 70 were from turkeys. This relative "species specificity" has been noted consistantly in past years. Second, turkey was the only item of food eaten by the motel employee positive for S. reading. Third, S. reading was isolated from the processing plant in which the turkey roasts were prepared. Conditions at this plant were such that cross contamination between raw turkey and finished product would have been possible. And finally, the manner in which at least a portion of the turkey was prepared by the motel was inadequate to eliminate salmonella. Two of the eight roasts served were only partially thawed and briefly cooked. Although the roasts are labeled as "precooked and ready-to-eat", this method of preparation would not have eliminated the organisms if they had been contaminated during processing.

The investigation of this outbreak illustrates the value of cooperation between epidemiologists and food inspectors. Under a newly initiated program, the Toxicology Group, Consumer and Marketing Service, U.S. Department of Agriculture, is anxious to participate in such investigations whenever meat or poultry contamination is suspected as the cause of an outbreak.

V. SPECIAL REPORTS

A. Recent Articles on Salmonellosis

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

1. Abrahamsson, K., et al.: Detection of salmonella by a single culture technique. Appl. Microbiol. 16:1695, 1968.

2. Adams, R., et al.: Susceptibility of salmonellae to cephalosporins and to nine other antimicrobial agents. Appl. Microbiol. 16:1570, 1968.

3. Callaghan, P., et al.: Laboratory investigation of sewer swabs following the Aberdeen typhoid outbreak of 1964. J. Hyg. 66:489, 1968.

4. Dlabac, V.: The sensitivity of smooth and rough mutants of Salmonella typhi-murium to bactericidal and bacteriolytic action of serum, lysozyme and to phagocytosis. Folia Microbiol. 13:439, 1968.

5. Hejfec, L. B., et al.: Controlled field trials of paratyphoid B vaccine and evaluation of the effectiveness of a single administration of typhoid vaccine. Bull. W. H. O. 38:907, 1968.

6. Newberne, P. M., et al.: The role of diet and the reticuloendothelial system in the response of rats to Salmonella typhi-murium infection. Brit. J. Exp. Pathol. 49:448, 1968.

7. Riemann, H.: Effect of water activity on the heat resistance of salmonella in "dry" materials. Appl. Microbiol. 16:1621, 1968.

8. Timoney, J.: The sources and extent of salmonella contamination in rendering plants. Vet. Rec. 83:541, 1968.

9. Woodburn, M., et al.: Salmonella contamination of production and processing facilities for broilers and ducklings. Poultry Sci. 47:777, 1968.

B. Cooperative State - Federal Salmonella Program in Rendering Plants - Fiscal Year 1968

Reported by Saul T. Wilson, Jr., D.V.M., M.P.H., Chief Staff Veterinarian, Poultry Diseases, and Francis W. Germaine, B.S., Program Specialist, Poultry Diseases, Animal Health Division, Agricultural Research Service, U.S. Department of Agriculture. A complete report of the results of this program will be included in the Proceedings of the Seventy-Second Annual Meeting, U.S. Livestock Sanitary Association.

The U.S. Department of Agriculture, in cooperation with the States, has initiated a program aimed at the control of salmonella contamination of animal proteins used in livestock and poultry feeds (rendered animal by-products and marine products). Participation in the program is completely voluntary and requires three plant inspections a year by state or federal personnel. Of the 924 plants producing animal protein for livestock and poultry feeds in the United States, 874 (95 percent) are now participating in this program. In the first 5 months of the year, five 100 gm samples of finished product were obtained at each inspection and 30 gm of each sample was used for culture. Since then, ten 100 gm samples of finished product have been obtained at each inspection.

By the end of fiscal year 1968, at least one inspection had been conducted in 718 plants, and four inspections had been carried out in 243. Of 14,512 finished product samples cultured, 2,278 (15.7 percent) were positive for salmonella. At the initial inspection, at least one positive sample was obtained from 295 of 718 plants (41.1 percent). Of the 243 plants inspected four times, at least one positive sample was obtained from 189 (77.7 percent).

The ten most common serotypes isolated are presented in the table below. S. typhi-murium, the salmonella serotype most frequently isolated from both humans and nonhuman sources, accounted for only 1.8 percent of total isolates, and was the 17th most frequently isolated from these sources. The relative infrequency of isolation of S. typhi-murium from animal feeds has been observed consistently in the past.

The Ten Most Frequently Isolated Serotypes From Rendered Animal and Marine Products Fiscal Year 1968

Serotype	Number Isolated	Percent of Total Isolates
montevideo	262	12.0
eimsbuettel	249	11.4
senftenberg	189	8.7
infantis	112	5.2
oranienburg	110	5.1
anatum	101	4.6
derby	78	3.6
binza	71	3.3
schwarzengrund	59	2.7
bareilly	55	2.5
Total	1,286	59.1
TOTAL (all serotypes)	2,175	

C. Recalls of Products Contaminated with Salmonellae for Period November 20 to January 13 (reported by U.S. Food and Drug Administration).

From November 20, 1968 to January 13, 1969, two products were recalled by manufacturers and distributors because of salmonella contamination. These products as reported by the U.S. Food and Drug Administration are summarized in the table below.

Week Ending	Name, Label, Form	Manufacturer, Distributor	Lot No.	Use	Depth of Recall	Product Distribution	Serotype
12/16	American Beauty Frozen Home Style Noodles in 8 oz. cello pkgs. (Dist. by American Beauty Macaroni Co., Kansas City, Kansas)	Home Style Inc., Wahoo, Nebraska	0308A	Food	Retail	Kansas and Missouri	S. cubana
12/16	Skinner Kluski Type Home Style Frozen Enriched Egg Noodles (Dist. by Skinner Macaroni Co., Omaha, Nebraska)	Frost Rite Inc., Omaha, Nebraska	Case Codes 2048 2098	Food	Wholesale	Nebraska and Arizona	S. meleagridis

VI. INTERNATIONAL

NONE

VII. FOOD AND FEED SURVEILLANCE

Salmonella Contamination of Frog Legs

Reported by Andrew Mallory, M.D., and Bernard Aserkoff, M.D., EIS Officers, Epidemiology Program, NCDC; Steven S. Gross, Inspector, Miami Section, Atlanta District, U.S. Food and Drug Administration; and George K. Morris, Ph.D., Epidemiological Services Laboratory Section, Epidemiology Program, NCDC.

Since 1967, a number of isolations of salmonella have been made from commercially produced frog legs. During the latter part of 1967, the laboratories of the Canadian Food and Drug Directorate isolated salmonellae from frog legs originating in India, Japan, Pakistan, Mexico, Cuba, and Canada. S. typhi-murium, S. typhi-murium var. copenhagen, S. bareilly, S. heidelberg, S. newport, and S. thompson were among numerous serotypes reported. Concurrently, the U.S. Food and Drug Administration reported a high frequency of salmonella contamination among samples of frog legs imported from India and in April 1968, the FDA and NCDC isolated S. newport and S. litchfield from frozen frog legs processed in the Miami, Florida, area.

In an effort to discover reasons for this contamination, the FDA and NCDC conducted a limited investigation of the frog leg industry in southern Florida during November 1968. In this locale, the majority of frogs are caught by local hunters who gig along prepared routes in the Everglades at night. The hunters remove the hind legs the next morning, skin the legs, and deliver their entire stock to one of several local suppliers. Here, the legs are immediately weighed, rinsed 1-4 times with water, placed in chipped ice, and, later, shipped to one of several Florida distributors for freezing and for eventual shipping to various points in the United States.

Environmental samples and frog legs were obtained for culture from each stage in this process. Salmonellae were isolated from samples of water from the Everglades in the frog hunting area (S. hartford), from whole frogs prior to dismemberment (untyped), from frog legs prior to washing (S. saint-paul, S. oslo, S. newport, S. hartford, S. miami and an untyped group E_2), from environmental samples from local supplier facilities (S. saint-paul, S. hartford and untyped group E_1 and group C_2), and from packed frozen frog legs just prior to national distribution (S. manhattan and S. muenchen).

The most intriguing finding was the isolation of salmonellae from water from the Everglades and from frogs prior to processing. Are salmonella organisms able to persist for long periods of time or even multiply in the warm, organically rich water of the swamp? Or is the contamination related to human sewage disposal? Or is the presence of salmonellae related to a high incidence of infection among the swamp wildlife population? Or is there in nature a high incidence of transmission of salmonella organisms from frog to frog (e.g. by a transovarian mechanism)? The answers to these questions must await further study.

No salmonella infections associated with contaminated frog legs have as yet been reported to the NCDC. This is not surprising since frog legs are generally well cooked prior to ingestion. The major hazard may arise from the introduction of a contaminated item into a kitchen, with resultant cross contamination of other foods not subsequently cooked sufficiently to destroy the organisms. Public health workers should be alerted to the problem and to the possibility of cross contamination of other items implicated in foodborne outbreaks. The Salmonellosis Unit is interested in obtaining any information related to this problem and will gladly furnish any assistance in investigations if needed.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, DECEMBER 1968

SEROTYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																													
	NEW ENGLAND						MIDDLE ATLANTIC					EAST NORTH CENTRAL					WEST NORTH CENTRAL							SOUTH ATLANTIC							
	ME	NH	VT	MAS	RI	CON	NYA	NYB	NYC	NJ	PA	OHI	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA
anatum				1							3		2	1																	
bareilly											7													19							
blockley				2		1		1	1		3	1	2	2	2																
braenderup				4					1																						
bredeney														1																	
chester						1													1												
cholerae-suis v kun																															1
cubana				1						1				5																1	
derby								2	2	3	1			3	1		1						2								
enteritidis				12		1		8	5	18	6	4	13	7	8	3	1	1	2	6			1		7	1	7		1		3	2
give								1	1																						
heidelberg				3				1	2	9	11	8		11	3				1				3	1	1		1			2	2
indiana																														1	
infantis				1		2	1	2	2	2		2	1	8	2	5	1		2				3		2		1			3	
java						1				1				3		1															
javiana											4			1					2												17
litchfield									1					1		1														1	2
livingstone																															
manhattan										1	2			2											1						4
miami																															9
mississippi																															
montevideo															1	2	2										1			3	
muenchen								4	1										1				3		1			1			5
newington									1					1									1								
newport				3				1	1	2		3	1	8	4	1			1				1		1		1		3	2	22
oranienburg				2					1	2			1				1														4
panama				2					1		2			1		2													1		
paratyphi B								1							1																
reading																														3	
saint-paul									2	1		4		5	2	4			1		2		1		1		3		1		13
san-diego				2		1																									
schwarzengrund													1	3																	
senftenberg				1																											
tennessee								1																							1
thompson				10					2		1			7	3		1			1							5	1	1		3	
typhi				2				1		1		1		1	2	1			2	1		2									1
typhimurium	1		2	20	1	12	2	23	18	21	16	8	3	34	7	14	8	19	6	1			5	3	11	1	9	1	7	3	17	11
typhimurium v cop				1		6				1					3																
weltevreden																															
worthington																	1														
TOTAL	1	–	2	67	1	25	3	46	42	63	56	31	24	105	39	34	16	20	19	9	2	2	20	23	25	2	28	3	14	3	39	94
ALL OTHER*	–	2	–	2	–	–	26	2	2	–	2	1	1	4	1	1	1	4	–	–	–	1	1	–	1	5	–	–	1	–	4	5
TOTAL	1	2	2	69	1	25	29	48	44	63	58	32	25	109	40	35	17	24	19	9	2	3	21	23	26	7	28	3	15	3	43	99

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

* See Table II.

TABLE I – Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																				TOTAL	% OF TOTAL	CUMULATIVE TOTAL	% OF CUMULATIVE TOTAL	SEROTYPE
EAST S. CENTRAL				WEST S. CENTRAL				MOUNTAIN								PACIFIC								
KY	TEN	ALA	MIS	ARK	LA	OKL	TEX	MON	IDA	WYO	COL	NM	ARI	UTA	NEV	WAS	ORE	CAL	ALK	HAW				
1					1				1									2			12	0.9	209	1.1	*anatum*
					1		1														28	2.0	95	0.5	*bareilly*
											1							7			23	1.6	484	2.5	*blockley*
																					5	0.4	139	0.7	*braenderup*
							1											1			3	0.2	169	0.9	*bredeney*
2																		1			5	0.4	56	0.3	*chester*
																		1			2	0.1	29	0.1	*cholerae-suis v kun*
		1																1			10	0.7	59	0.3	*cubana*
			1				1											2		4	23	1.6	409	2.1	*derby*
	3							1								1		1		29	152	10.8	1,736	8.8	*enteritidis*
	1				1													1			5	0.4	65	0.3	*give*
	4	2			1								2	1		2	1	17			89	6.3	1,321	6.7	*heidelberg*
																					1	0.1	84	0.4	*indiana*
1	1				3	1	1		1		2							2		2	54	3.8	944	4.8	*infantis*
																	1				7	0.5	195	1.0	*java*
		1			2		10						2								39	2.8	511	2.6	*javiana*
																					6	0.4	92	0.5	*litchfield*
							6						2							1	9	0.6	44	0.2	*livingstone*
																		4		1	15	1.1	199	1.0	*manhattan*
																					9	0.6	117	0.5	*miami*
					1																1	0.1	50	0.3	*mississippi*
					1						1							3			14	1.0	270	1.4	*montevideo*
							1							1				4		1	23	1.6	210	1.1	*muenchen*
		1																			4	0.3	44	0.2	*newington*
		1		3	6	1	14						3			1		10		2	96	6.8	1,238	6.3	*newport*
							1											2			14	1.0	294	1.5	*oranienburg*
							2											3		4	18	1.3	229	1.2	*panama*
									1		1					1					5	0.4	115	0.6	*paratyphi B*
													1			29	1	1			35	2.5	74	0.4	*reading*
	3				1		3							1		3	1	4			56	4.0	1,141	5.8	*saint-paul*
																				1	4	0.3	106	0.5	*san-diego*
																		2			6	0.4	54	0.3	*schwarzengrund*
	1				2															1	5	0.4	64	0.3	*senftenberg*
					2																4	0.3	84	0.4	*tennessee*
1							2		3								2	8			51	3.6	667	3.4	*thompson*
2	1			1	1		1											11	3		35	2.5	609	3.1	*typhi*
1	6	7	1	3	17		23		1		7		1	3		4	1	35		1	395	28.1	5,123	25.9	*typhimurium*
	1			2	1				2				3								20	1.4	306	1.5	*typhimurium v cop*
																				5	5	0.4	78	0.4	*weltevreden*
																					1	0.1	22	0.1	*worthington*
8	21	13	2	9	41	2	67	1	9	–	12	–	14	6	–	41	7	123	3	52	1,289	91.5	17,735	87.8	TOTAL
–	3	–	2	5	1	–	6	–	–	–	1	18	–	–	1	1	2	9	–	3	119		2,010		ALL OTHER*
8	24	13	4	14	42	2	73	1	9	–	13	18	14	6	1	42	9	132	3	55	1,408		19,745		TOTAL

TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES, DECEMBER 1968

SEROTYPE	REPORTING CENTER																					
	ARK	CAL	COL	DC	FLA		GA	HAW	ILL	IND	IOW		KAN	LA	MD	MAS	MIC		MIN	MIS	NEB	NEV	NH
alachua		1															1						
albany																							
amager									1														
berta																							
brandenburg																							
california		1							1														
cerro								1		1													
cholerae-suis		1																					
coleypark																							
drypool							1																
good									1														
habana																							
madelia	1																						
minnesota																							
muenster							1																
new-brunswick																							
orion			1																				
oslo								2															
paratyphi A																							
pensacola							1																
pharr														1									
poona		1																					
siegburg							1																
simsbury																1							
taksony																							
tallahassee					1																		
urbana		1			2										1								
westhampton													1										
TOTAL	1	5	1	–	3		4	3	3	1	–		1	1	1	1	1		–	–	–	–	–
NOT TYPED*	4	4	–	5	2		–	–	1	–	4		–	–	–	1	–		1	2	1	1	2
TOTAL	5	9	1	5	5		4	3	4	1	4		1	1	1	2	1		1	2	1	1	2

* See Table V-A

TABLE II – Continued

REPORTING CENTER														TOTAL	CUMULATIVE TOTAL	SEROTYPE
NM	NYA	NYB	NYC	NC		OHI	ORE	PA	TEN		TEX	WAS	WIS			
							1							3	23	*alachua*
				1										1	18	*albany*
														1	1	*amager*
									3					3	30	*berta*
											2			2	5	*brandenburg*
														2	22	*california*
														2	12	*cerro*
			1			1								3	15	*cholerae-suis*
												1		1	2	*coleypark*
														1	6	*drypool*
														1	1	*good*
			1											1	7	*habana*
														1	6	*madelia*
								1						1	19	*minnesota*
														1	32	*muenster*
											1			1	5	*new-brunswick*
														1	6	*orion*
														2	14	*oslo*
								1						1	13	*paratyphi A*
														1	13	*pensacola*
														1	1	*pharr*
		1												2	73	*poona*
														1	8	*siegburg*
														1	6	*simsbury*
		1												1	1	*taksony*
														1	8	*tallahassee*
														4	29	*urbana*
														1	3	*westhampton*
–	–	2	2	1		1	1	2	3		3	1	–	42	709	TOTAL
18	26	–	–	–		–	1	–	–		3	–	1	77	1,301	NOT TYPED*
18	**26**	**2**	**2**	**1**		**1**	**2**	**2**	**3**		**6**	**1**	**1**	**119**	**2,010**	**TOTAL**

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

TABLE III. COMMON SALMONELLAE REPORTED FROM NONHUMAN SOURCES, DECEMBER 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
anatum			3				3			1	1
bareilly							—				—
blockley	7	2					9				—
braenderup							—				—
bredeney		3					3				—
chester							—				—
cholerae-suis v kun			15				15				—
cubana							—	1			1
derby		3		1			4	5			5
enteritidis	2					2	4				—
give							—				—
heidelberg	6	19		5			30	2		1	3
indiana							—				—
infantis	8	1				4	13				—
java							—				—
javiana							—				—
litchfield							—				—
livingstone							—				—
manhattan							—				—
miami							—				—
mississippi			1				1				—
montevideo	1						1	1			1
muenchen							—				—
newington							—				—
newport		2		4		2	8				—
oranienburg							—	6			6
panama							—				—
paratyphi B							—				—
reading							—				—
saint-paul	6	22	1	5		1	35	1			1
san-diego		2					2				—
schwarzengrund						1	1	1			1
senftenberg		2					2	1		1	2
tennessee		2					2	1		1	2
thompson	8		1			1	10				—
typhi							—				—
typhimurium	1	3	6	31		8	49				—
typhimurium v cop	18					1	19				—
weltevreden							—				—
worthington	1						1	2			2
TOTAL	58	61	27	46	—	20	212	21	—	4	25
ALL OTHER*	3	5	7	13	—	8	36	7	—	5	12
TOTAL	**61**	**66**	**34**	**59**	**—**	**28**	**248**	**28**	**—**	**9**	**37**

* See Table IV

TABLE III – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
							–		4	509	*anatum*
							–		–	33	*bareilly*
							–		9	220	*blockley*
							–		–	25	*braenderup*
							–		3	130	*bredeney*
							–		–	45	*chester*
1							–		16	164	*cholerae-suis v kun*
							–		1	301	*cubana*
							–	1	10	270	*derby*
2		7				2	9		15	143	*enteritidis*
							–	1	1	55	*give*
3							–	1	37	627	*heidelberg*
							–		–	17	*indiana*
		3					3		16	405	*infantis*
							–		–	26	*java*
							–		–	12	*javiana*
							–		–	3	*litchfield*
							–		–	144	*livingstone*
							–		–	26	*manhattan*
							–		–	10	*miami*
							–		1	2	*mississippi*
		1			2	2	5	1	8	450	*montevideo*
	1						–		1	94	*muenchen*
							–		–	111	*newington*
							–		8	202	*newport*
							–		6	170	*oranienburg*
							–		–	64	*panama*
							–		–	7	*paratyphi B*
							–		–	26	*reading*
							–	3	39	396	*saint-paul*
							–		2	45	*san-diego*
							–	2	4	78	*schwarzengrund*
							–		4	303	*senftenberg*
		1					1	1	6	172	*tennessee*
		4					4		14	265	*thompson*
							–		–	–	*typhi*
5							–	3	57	1,052	*typhimurium*
		1					1		20	262	*typhimurium v cop*
							–		–	10	*weltevreden*
							–	2	5	119	*worthington*
11	1	17	–	–	2	4	23	15	287	6,993	TOTAL
2	2	2	–	–	2	–	4	7	63	1,686	ALL OTHER*
13	3	19	–	–	4	4	27	22	350	8,679	TOTAL

TABLE IV. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES, DECEMBER 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
alachua							–				–
albany	1						1				1
aqua		1					1				1
binza							–			1	1
california							–			1	1
cerro		1					1				–
cholerae-suis			7				7				7
drypool							–	2			2
dublin				5			5				–
eimsbuettel						2	2			1	1
grumpensis							–			1	1
kentucky	1	1					2				–
meleagridis		1		1		2	4			1	1
minnesota							–	3			3
mission							–				–
narashino						2	2				–
orientalis							–				–
orion		1				1	2	1			1
rubislaw							–				–
siegburg							–	1			1
urbana							–				–
TOTAL	2	5	7	6	–	7	27	7	–	5	12
NOT TYPED*	1	–	–	7	–	1	9	–	–	–	–
TOTAL	**3**	**5**	**7**	**13**	**–**	**8**	**36**	**7**	**–**	**5**	**12**

*See Table V-B

TABLE IV – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
		1					1		1	45	*alachua*
							–		1	13	*albany*
							–		1	1	*aqua*
							–		1	67	*binza*
							–		1	73	*california*
							–	2	3	143	*cerro*
							–		7	15	*cholerae-suis*
							–		2	44	*drypool*
							–		5	73	*dublin*
							–		3	251	*eimsbuettel*
							–		1	10	*grumpensis*
							–	2	4	107	*kentucky*
							–		5	42	*meleagridis*
							–	2	5	92	*minnesota*
					2		2		2	5	*mission*
							–		2	3	*narashino*
	1						–		1	1	*orientalis*
							–		3	33	*orion*
							–	1	1	21	*rubislaw*
		1					1		2	78	*siegburg*
	1						–		1	16	*urbana*
–	2	2	–	–	2	–	4	7	52	1,596	TOTAL
2	–	–	–	–	–	–	–	–	11	90	NOT TYPED*
2	2	2	–	–	2	–	4	7	63	1,686	TOTAL

TABLE V. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY, DECEMBER 1968

A. HUMAN SOURCES

REPORTING CENTER	GROUP															TOTAL
	B		C		C1		C2		D		UNK.					
ARKANSAS	1						2		1							4
CALIFORNIA	1										3					4
DISTRICT OF COLUMBIA	2										3					5
FLORIDA											2					2
ILLINOIS					1											1
IOWA			1		1						2					4
MASSACHUSETTS	1															1
MINNESOTA					1											1
MISSISSIPPI											2					2
NEBRASKA											1					1
NEVADA	1															1
NEW HAMPSHIRE									1		1					2
NEW MEXICO	10				4		3		1							18
NEW YORK – A											26					26
OREGON									1							1
TEXAS	1						1				1					3
WISCONSIN	1															1
TOTAL	18		1		7		6		4		41					77

B. NONHUMAN SOURCES

SOURCES	GROUP															TOTAL
	B		C		C1		C2		D		UNK.					
DOMESTIC ANIMALS AND THEIR ENVIRONMENT	8										1					9
ANIMAL FEEDS																–
WILD ANIMALS AND BIRDS							2									2
REPTILES AND ENVIRONMENT																–
HUMAN DIETARY ITEMS																–
MISCELLANEOUS																–
TOTAL	8		–		–		2		–		1					11

STATE EPIDEMIOLOGISTS AND STATE LABORATORY DIRECTORS

Key to all disease surveillance activities are the physicians who serve as State epidemiologists. They are responsible for collecting, interpreting, and transmitting data and epidemiological information from their individual States; their contributions to this report are gratefully acknowledged. In addition, valuable contributions are made by State Laboratory Directors; we are indebted to them for their valuable support.

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