REPORT NO. 111
NOVEMBER 1971

CENTER FOR DISEASE CONTROL

SALMONELLA

SURVEILLANCE

CONTENTS . . .

FOR THE MONTH OF JUNE 1971

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

In June 1971, 1,841 isolations of salmonellae were reported from humans, an average of 368 isolations per week (Table I, II, and V-A). This number represents a decrease of 91 (19.8 percent) from the weekly average of May 1971, and a decrease of 91 (19.8 percent) from the weekly average of June 1970.

Reports of 237 nonhuman isolations of salmonellae were received during June 1971 (Tables II, IV, and V-B).

II. REPORTS OF ISOLATIONS

The twelve most frequently reported serotypes during June:

	HUMAN			Rank Last Month	NONHUMAN		
	Serotype	Number	Percent		Serotype	Number	Percent
1	typhi-murium*	518	28.1	1	typhi-murium*	59	24.9
2	enteritidis	192	10.4	2	reading	37	15.6
3	heidelberg	134	7.3	3	san-diego	10	4.2
4	newport	103	5.6	5	thompson	10	4.2
5	infantis	84	4.6	4	dublin	7	3.0
6	saint-paul	73	4.0	7	heidelberg	7	3.0
7	thompson	51	2.8	6	muenchen	7	3.0
8	muenchen	50	2.7	>10	anatum	5	2.1
9	manhattan	36	2.0	>10	drypool	5	2.1
10	blockley	35	1.9	8	livingstone	5	2.1
11	derby	35	1.9	>10	panama	5	2.1
12	java	35	1.9	9	saint-paul	5	2.1
	Total	1,346	73.1		Total	162	68.4
	TOTAL (all serotypes)	1,841			TOTAL (all serotypes)	237	
	*Includes var. copenhagen	25	1.4		*Includes var. copenhagen	3	1.3

III. REPORTS FROM THE STATES

A. Reports of Salmonella Outbreaks Received in June

State	Month of Outbreak	Location	Serotype	Number of Persons Ill	At Risk	With positive cultures	Hospitalized	Deaths	Vehicle	Comment
Washington	March '71	Home	S. bredeney	1	?	1	0	0	Pet dog	S. bredeney isolates from dog's stool; dog had been ill previously
New York	March '71	Restaurant	S. enteritidis	120	235	6	1	0	Unknown food	S. derby isolated from roast beef and salad dressing

B. Salmonella Outbreaks Traced to Home-Smoked Fish, Flint, Michigan
Dr. Don McNaughton, Health Officer, Marvin Baumann, Chief Sanitarian, and staff, District No. 7 Health Department, Flint-Genessee County Health Department, Dr. Stanley, physician; Dr. Textor, osteopath, Dr. D. Cohoon, Michigan Department of Public Health.

In April 1971, an outbreak of salmonellosis occurred in Flint, Michigan. Twenty-eight of 37 persons who consumed home-smoked sucker fish became ill. Twenty-four of the 28 were interviewed and described the following symptoms: diarrhea (83%), abdominal cramps (79%), nausea (67%), fever (62%), vomiting (46%) and chills (33%). Duration of illness ranged from 12 hours to 21 days with a mean of 4 days. Three patients were hospitalized; there were no deaths. There were 10 stool cultures positive for S. typhi-murium and one for S. san-diego.

Investigation by the Flint-Genesse County Health Department revealed that 50 live sucker fish were purchased by a Flint resident from a dealer in Omar, Michigan, on April 18. These were transported on ice to a friend's home where they were immediately placed in a laundry tub, then dressed on an adjacent table and finally stored in a freezer. Four days later, 18 of these fish were soaked in brine for 13 hours, smoked for a similar period and finally dried in a 200° F oven for 30-60 minutes. These fish were distributed to friends on the following day; a second batch of fish was similarly prepared and distributed on April 23-24. Persons eating fish from both batches became ill. A third batch was prepared but not eaten; 10 of these fish were cultured and one was positive for S. typhi-murium. Cultures of several frozen, unsmoked fish were negative for salmonella though cultures of raw fish eggs accompanying the fish yielded S. san-diego.

The fish eggs may have been responsible for at least the one case due to that serotype, however, it is not clear how the fish became contaminated with S. typhi-murium. The individual who processed and handled the fish prior to its distribution became ill at the same time as the others; he also ate the fish.

Further investigation disclosed that several chicks and ducks were allowed to roam near the area where the fish were dressed. Two cultures of fowl feces were negative for salmonella. The smoking and drying apparatus did not have adequate temperature controls; and it is suspected that temperatures obtained were not high enough to kill salmonellae.

All uneaten fish were confiscated by the Flint-Genessee County Health Department and destroyed. The health department recommends that persons who home-smoke fish employ temperatures adequate to destroy contaminating organisms. The use of meat thermometers and the baking of inadequately heated fish should help eliminate the problem.

C. Salmonella berta Due to Custard-Filled Pastries, California.
Reported by Doreen M. Wysocki, PHN, John Scott, Sanitarian, and Lynn E. Wolfe, Jr., M.D., Health Officer, Tehama County Health Department; Catherine Powers, B. A., Associate Microbiologist, and Ronald Wood, Ph.D., Director of the Microbial Diseases Laboratory, California State Department of Public Health; and S. Benson Werner, M.D., Medical Epidemiologist, Infectious Disease Element, California State Department of Public Health.

A sizable outbreak of salmonellosis due to the relatively rare serotype S. berta occurred in a northern California community during July 1971. About 200 ill persons were identified, 15 were hospitalized, and two deaths occurred in elderly individuals. Investigation revealed the vehicle to be custard-filled pastries, particularly maple bars, processed at a single bakery. The contaminated ingredient was found to be unpasteurized frozen turkey eggs. S. berta was isolated from 36 of 54 individuals submitting stool specimens, from several maple bars and other pastries, and from previously unopened containers of the frozen turkey eggs. Three bakery employees and the owner of the turkey breeding farm supplying the eggs submitted stool cultures positive for S. berta. Environmental swabs at the turkey farm (including turkey manure and eggshell scrapings), were negative for this organism.

The bakery was temporarily closed for thorough cleaning, disinfection, and recommended remodeling. Environmental swabs taken after cleaning were negative for S. berta. Bakery workers will be required to be negative for salmonellae before returning to work. The bakery will no longer use unpasteurized frozen eggs. (Since June 1966, the California Agricultural Code has required that all egg products for human consumption be pasteurized). The turkey breeding farm has discontinued processing bulk eggs.

Editorial comment: Outbreaks of salmonellosis involving contaminated eggs though frequent in the past are unusual today. Since July 1, 1966, the U. S. Department of Agriculture has required pasteurization of all egg products* in USDA inspected plants. Mandatory pasteurization in all plants has been required since July 1, 1971. The Salmonella Surveillance Report, 1966, reported 8 outbreaks associated with eggs and egg products; none were reported to CDC in 1970.

IV. SPECIAL REPORTS

A. Recent Articles on Salmonellosis

1. DuPont HL, Hornick RB, Snyder MJ, et al: Immunity in typhoid fever: evaluation of live streptomycin-dependent vaccine. Antimicrob Agents Chemother, 1970

2. Wilson VR, Hermann GJ, Balows A: Preliminary report of a new system for typing Salmonella typhi-murium in the United States. Appl Microbiol 21:774, 1971

3. Smith ER, Badley BWD: Treatment of Salmonella enteritis and its effect in the carrier state. Canad Med Assoc J 104:1004, 1971

4. Walker JH: Typhoid and paratyphoid immunization. The Practitioner 206:478, 1971

5. Sharma S, Agarwal SC: Ampicillin and tetracycline resistance of salmonella. Indian J Med Research 58:1307, 1970

6. Pocurull DW, Gaines SA, Mercer HD: Survey of infectious multiple drug resistance among salmonella isolated from animals in the United States. Appl Microbiol 21:358, 1971

7. Powell DW, Solberg LI, Plotkin, GR, et al: Experimental diarrhea: I. Intestinal water and electrolyte transport in rat salmonella enterocolitis, II. Glucose-stimulated sodium and water transport in rat salmonella enterocolitis, III. Bicarbonate transport in rat salmonella enterocolitis. Gastroenterology Vol. 60, No. 6, June 1971

8. Kwivelt VA, Stevens WK: The evaluation of a live salmonella vaccine in mice and chicken. J Hyg Vol. 69, No. 2, June 1971

9. de Hamel FA, McInner HM: Lizards as vectors of human salmonellosis. J Hyg Vol. 69, No. 2, June 1971

10. Axeloval L, Munsler AM, Obner TF: Typhoid cholecystitis and cancer after 67 years. JAMA Vol. 217, No. 1, July 5, 1971.

B. Announcement of a Change in the Frequency of Salmonella Surveillance Reports

Beginning in July 1971, the Salmonella Surveillance Report will be distributed quarterly, rather than the present monthly distribution. This report, number 111, will be the final monthly issue. Report No. 112 will include surveillance data for the months of July, August, and September.

This revised distribution schedule has been favorably received by the Association of State and Territorial Epidemiologists and by readers of the Salmonella Surveillance Report. One of the important decisions leading to this change is the recognition that the more common modes of salmonella transmission, such as mishandled foods, person-to-person spread, and contact with pets, seldom require immediate reporting as an adjunct to control. Quarterly publications will continue to provide timely information on current salmonellosis topics.

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*Egg products used in the processing of "acidic" mayonnaise are excepted.

As in the past, outbreaks traced to or potentially due to commercial food products and other timely news items will be published weekly in the Morbidity and Mortality Weekly Reports (MMWR). Persons who desire this publication may write to the Editor, Morbidity and Mortality Weekly Report, Center for Disease Control, Atlanta, Georgia 30333.

We wish to thank those readers who sent us their comments on this change.

C. Announcement of a Course Describing Methods of Isolating Salmonellae From Food Products and Animal Feeds

The Epidemiology Program and the Laboratory Division of the Center for Disease Control will conduct a 2-week course, January 3-14, 1972, describing methods of isolating salmonellae from food products and animal feeds. The prerequisite is 6 months experience in a bacteriology or quality control laboratory. The course will be divided equally between lectures and laboratory exercises.

Lecture topics will include epidemiology, sampling, and principles of isolation and identification. The laboratory exercises will provide experience in isolating and identifying biologically and serologically the salmonellae from foods and feeds. The products to be analyzed will include eggs, dried milk, candy, red meats, poultry, animal by-products, and fish meal.

State, federal and industry personnel may obtain application forms from:

Laboratory Training Section
Laboratory Division
Center for Disease Control
Atlanta, Georgia 30333

There will be no charge for the course, but enrollment is limited to 20 students.

D. Resolution from Conference of State and Territorial Epidemiologists, May 9-14, 1971--Chicago, Illinois--Regarding: Phage Typing of Salmonella typhi-murium.

All state health departments will retain all isolates of S. typhi-murium for a period of at least 30 days; in the event of an outbreak or suspect outbreak, involving either repetition of cases or replication of cases, these isolates will be forwarded to CDC for phage typing.

V. International

A. Typhoid Fever--Trinidad

Reported by S. Abidh, M.D., L.M.C.C., D.P.H., Regional Director of Health, and staff, South Trinidad and County Medical Officer of Health, Victoria; P. Ardoin, M.D., Director of Trinidad Regional Virus Laboratory, and staff; Alison Carss, M.D., B. Ch., Medical Officer of Health, St. George West; Alejandro Santiago, M.D., M.P.H., County Medical Officer of Health, and staff, St. Andrew/St. David; Mrs. Anna Malm, M. Sc. (Microbiology), Chemistry/Food and Drugs Division, and staff, Ministry of Health; Mr. Andrew Mural, Regional Public Health Inspector, North Trinidad; L. P. Younglao, M.D., C. Ch., B.A.O., D.T.M.&H., M.P.H., County Medical Officer of Health, and staff, St. George West; and Andrew Taylor, Jr., M.D., Enteric Diseases Section, CDC.

In April 1971, an outbreak of typhoid fever involving 132 persons occurred in Trinidad. The epidemic began in early April, peaked in mid-April, and was over by May 3 (Figure 1). The shape of the curve suggests a common source outbreak with exposure occurring during the latter part of March. Twenty-three cultures from randomly selected patients were identified as S. typhi phage type A.

Patients with a positive stool, positive blood culture or a clinical presentation typical of typhoid fever accompanied by a Widal reaction (O titer) greater than 1/100 were diagnosed as typhoid fever. Clinical presentations and the Widal reaction were used to define cases because culture confirmation was not available early in the outbreak. Eighty-two percent of the 132 cases were in 5-15-year olds; the age distribution was similar for each affected area of the country (Table 1). Age (group) specific attack rates (per 100,000) indicated an epidemic primarily in school-age children (Table 2).

Figure 1 CASES OF TYPHOID FEVER, BY DATE OF ONSET, TRINIDAD, 1971

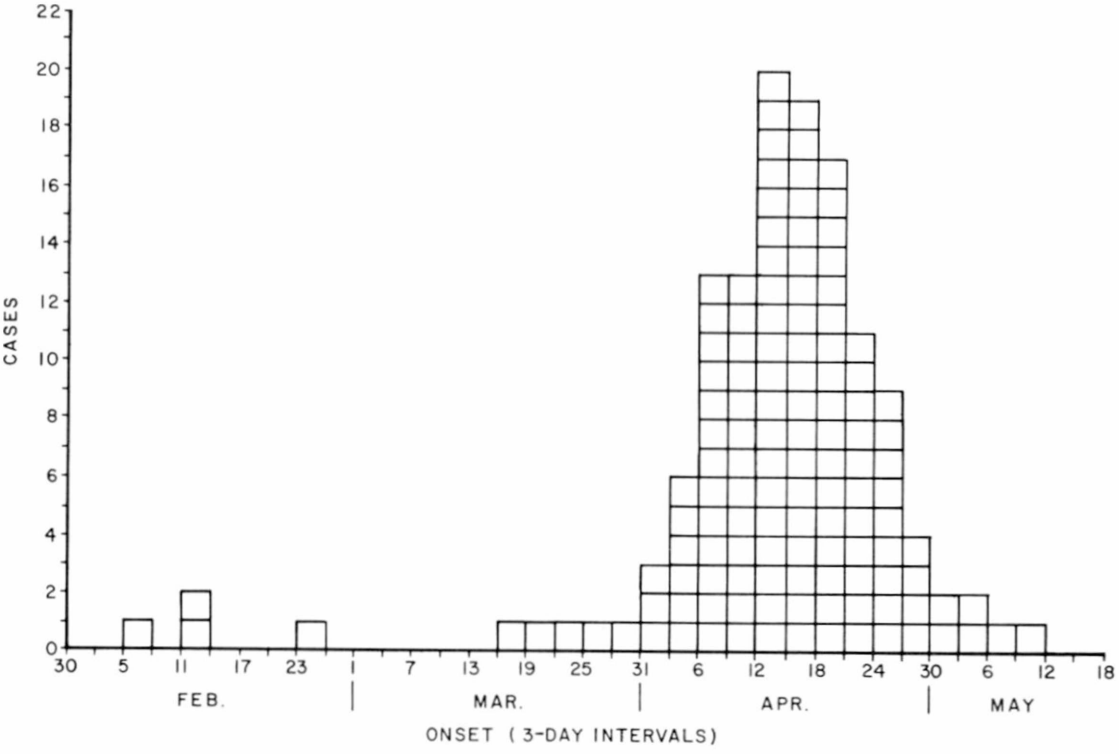

Table 1

Age and Sex Distribution of Typhoid Cases by Area

	Sangre Grande		Port of Spain		San Fernando		Other		Total				Cumulative
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Total	Percent	Percent
0- 4	0	0	1	0	0	0	2	1	3	1	4	3.2	3.2
5- 9	4	7	7	4	12	0	3	7	26	18	44	34.6	37.8
10-14	12	6	10	6	8	3	10	3	40	18	58	45.6	83.4
15-19	2	2	2	1	0	0	1	1	5	4	9	7.1	90.5
20-29	1	1	0	0	0	0	0	0	1	1	2	1.6	92.1
30-39	1	0	1	1	1	0	2	0	5	1	6	4.7	96.8
40-49	2	0	0	0	0	0	1	0	3	0	3	2.4	99.2
50-59	0	0	0	0	0	0	0	0	0	0	0	0.0	99.2
60 +	0	0	0	0	0	0	1	0	1	0	1	0.8	100.0
Subtotal	22	16	21	12	21	3	20	12	84	43	127	100	
Unknown	0	1	0	0	0	0	4	0	4	1	5		
Total	22	17	21	12	21	3	24	12	88	44	132		

Table 2

Attack Rates by Age and Sex
Trinidad, 1971

	MALE			FEMALE			BOTH SEXES		
	Ill	Total	Attack Rate (Per 100,000)	Ill	Total	Attack Rate (Per 100,000)	Ill	Total	Attack Rate (Per 100,000)
0- 4	1	75,150	1.3	3	73,150	4.1	4	148,300	2.7
5- 9	18	77,550	23.2	26	74,650	34.8	44	152,200	28.9
10-14	18	65,800	27.4	40	65,250	61.3	58	131,050	44.3
15-19	4	52,900	7.6	5	52,300	9.6	9	105,200	8.6
20-29	1	76,600	1.3	1	79,450	1.3	2	156,050	1.3
30-39	1	55,400	1.8	5	54,150	9.2	6	109,550	5.5
40-49	0	43,950	0	3	45,300	6.6	3	89,250	3.4
50-59	0	35,750	0	0	33,900	0.0	0	69,650	0.0
60 +	0	27,060	0	1	32,250	3.1	1	59,300	1.7

The epidemic occurred mainly in Port of Spain, Sangre Grande, and San Fernando (Figure 2); Port of Spain cases, however, occurred on the average a week before the others.

Figure 2
POLITICAL ADMINISTRATIVE DIVISIONS, TRINIDAD

Contamination of a nationally distributed product eaten primarily by school children was suspected. Two separate food preference questionnaires were completed by typhoid patients and control groups of healthy children; these did not implicate a single food, but ice cream products were suspicious. Review of the first two questionnaires revealed some inconsistent responses, consequently, models of pallets* and popsicles were made by stuffing the wrappers with paper. Children were then asked to point to items they customarily ate. With the assistance of these models, questionnaire #3 was administered to sick children in the Port of Spain and San Fernando Hospitals (Table 3), and to children from several schools who served as controls. Brand A popsicles were implicated ($p < .001$). Brand A popsicles included an ice cream and a fruity popsicle. In a fourth survey, sick children in the San Fernando and Port of Spain hospitals were asked to indicate which type of Brand A popsicle they ate; the ice cream popsicle (Table 4) was implicated.

Table 3

Food Specific Attack Rates for Children 5-15 Years of Age Eating Pallets or Popsicles

	ATE THE FOOD				DID NOT EAT THE FOOD					
	Well	Ill	Total	Attack Rate	Well	Ill	Total	Attack Rate	X^2	P
Brand B	237	21	258	8.1	514	31	545	5.7	1.356	.3
Brand C	337	23	360	6.4	428	29	457	6.3	.014	.95
Brand D	149	15	164	9.1	522	37	559	6.5	.864	.5
Brand A	554	51	605	8.4	180	1	181	0.6	12.74	<.001
Brand E	133	13	146	8.9	592	39	631	6.2	1.005	.5
Brand F	161	13	174	7.5	566	39	605	6.4	.093	.8

*Pallet is the term used in Trinidad to designate all types of ice cream sold on a stick. Popsicle designates a frozen non-milk product sold on a stick.

Table 4

Food Specific Attack Rates for Brand A

	ATE THE FOOD				DID NOT EAT THE FOOD					
	Well	Ill	Total	Attack Rate	Well	Ill	Total	Attack Rate	X^2	P
Brand A Fruity Popsicle	94	25	119	21.0	34	17	51	33.4	2.29	$p<.20$
Brand A Ice Cream Popsicle	94	43	137	31.4	35	2	37	5.4	8.946	$p<.01$

Three schools in San Fernando sold Brand A ice cream popsicles, however, only one had children with typhoid fever. On March 23, 1971, Brand A ice cream popsicles were distributed to this school and not to the two others. These popsicles were also sold in La Brea and Point Fortin, two towns south of San Fernando, however, on March 23 no Brand A ice cream popsicles were delivered to these towns; neither town had typhoid during the epidemic period. Brand A popsicles were also not distributed to the Island of Tobago; no typhoid occurred here during the epidemic period. The geographic distribution of typhoid closely paralleled that of the popsicles.

On March 23, 97 percent of Brand A popsicles distributed in Port of Spain were sold by vendors; almost all popsicles were sold the same day they were received. Along the connecting roads and in Sangre Grande and San Fernando, however, popsicles were sold in shops. Deliveries were usually made twice a week, and shops bought enough to last several days. The contaminated products in Port of Spain were bought and eaten the same day (March 23), whereas Sangre Grande and San Fernando shops sold their popsicles later, hence the delay of onset of typhoid in these areas.

Cultures of Brand A ice cream popsicles obtained in May demonstrated greater than 1,100 Escherichia coli organisms per 100 ml of ice cream. Investigation of the plant disclosed that popsicle ingredients were mixed in an open drum by hand, sticks were placed in the molds by hand, and the frozen product was wrapped by hand. Gloves were not worn, and neither product nor mix were pasteurized. Rectal swabs obtained from all employees including two recently discharged were negative for S. typhi. Cholecystograms performed in four selected employees were normal; stool cultures and repeat rectal swabs in these four persons were negative for S. typhi.

No water mains were broken near Brand A factory before March 22, the presumed date of contamination. Food products used in the ice cream popsicle on this day were also used on other days and in different products; these were not associated with illness.

Under the supervision of the health authorities, the factory producing the Brand A popsicle voluntarily suspended production until effective control measures could be implemented.

Editorial comment: This epidemic investigation which implicates a nationally distributed unpasteurized milk product points out that the public should be protected by mandatory pasteurization of milk and ice cream products particularly when strict sanitary standards cannot be adhered to and enforced.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, JUNE, 1971

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								2		1	2			1	2		1								1						
bareilly				1		1		1															1				1				
blockley						5		3	2	1				3	5		1								3				1		1	
braenderup						1								2																	
bredeney				2					1		1			1					1										1		3	
chester																1	1										1				
cholerae-suis v kun														1																1	
cubana				2							1				2										1		1				
derby				1		2				1	2	2		1	1	1		1							4				4		1	
enteritidis			1	9		6		16	13	2	11	3	2	31	6	8		1	10				16	1	5		2		1		5	
give				1										1					1						1						
heidelberg	1			5		4		2	4	5	4	2	3	11	8	2	3		1	1			4		6		3		1		7	
indiana				1					2	1	1				1																
infantis				3		3		5	6	3	2	2	2	3		4			1				2	1	4		3		1		5	
java								3	3	2	2			3		7	2		2												
javiana											1				1				1												3	
litchfield													1			1															1	
livingstone															1																
manhattan				1				2		2	3	1		2	1				1						5		3		1		2	
miami						1		1															1									
mississippi														1																1	
montevideo				1		2				3	2			1							2		2		4					1	
muenchen									1	1	3	1		2		2		1					8						3	5	
newington																											1				
newport				2	1	2		1	7	8	3	4	1	7	1	1			1	1					2		1	1	4		7	
oranienburg				2				1		1	2	1	2	2				1	1				1	1			4		1		1	
panama									2		1				1	1		1	1						7							
paratyphi B				4								1	2		1			1													
reading	1																														
saint-paul				2	2	1		2	5		1	4		3	10	3	3		2				3		3		1		3		4	
san-diego															1																
schwarzengrund													2			2															
senftenberg											2												1		1						
tennessee				1																			1				1				
thompson				3				1	1	2	9			2	4	2							4		2		1	5	2			
typhi						1	3					1	1	4	1											1		1	1			
typhimurium	10			34		21	1	23	24	20	24	5	7	24	12	21	10	5	14		5		11	1	18		16	3	17		23	
typhimurium v cop				5		2				3					8																
weltevreden																															
worthington																															
TOTAL	12	—	1	80	3	52	4	63	71	56	77	27	23	106	67	56	21	11	37	2	7	—	55	4	67	1	41	10	41	—	71	—
ALL OTHER*	—	8	1	7	8	4	24	4	—	—	1	—	1	5	6	3	—	3	2	1	—	4	1	2	—	11	4	—	6	—	1	—
TOTAL	12	8	2	87	11	56	28	67	71	56	78	27	24	111	73	59	21	14	39	3	7	4	56	6	67	12	45	10	47	—	72	—

Note: NYA — New York, Albany; NYB — Beth Israel Hospital; NYC — New York City. Beth Israel Hospital laboratory is a reference laboratory and this month serotyped a total of 105 cultures.

* See Table II.

TABLE I – Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																				TOTAL	% OF TOTAL	CUMULATIVE TOTAL	% OF CUMULATIVE TOTAL	SEROTYPE
EAST S. CENTRAL				WEST S. CENTRAL				MOUNTAIN								PACIFIC								
KY	TEN	ALA	MIS	ARK	LA	OKL	TEX	MON	IDA	WYO	COL	NM	ARI	UTA	NEV	WAS	ORE	CAL	ALK	HAW				
					1		4											2			17	0.9	119	1.1	*anatum*
																					5	0.3	24	0.2	*bareilly*
		1					2		2								2	2	1		35	1.9	273	2.6	*blockley*
	1																	1			5	0.3	47	0.4	*braenderup*
1		2			1											2		3			19	1.0	82	0.8	*bredeney*
																					3	0.2	34	0.3	*chester*
																					2	0.1	11	0.1	*cholerae-suis v kun*
				1			2		1									1			12	0.7	194	1.8	*cubana*
					2	1	1				1					1		4		4	35	1.9	201	1.9	*derby*
		7			3		14				5		3			1	1	5		4	192	10.4	987	9.3	*enteritidis*
							1											1			6	0.3	31	0.3	*give*
1	6	5		1	3		7						4			5		23		2	134	7.3	665	6.3	*heidelberg*
		1																			7	0.4	46	0.4	*indiana*
	4			4	6		1						4			5	2	6		2	84	4.6	549	5.2	*infantis*
1	3				2													5			35	1.9	268	2.5	*java*
		1		3		1	14														25	1.4	114	1.1	*javiana*
																					3	0.2	67	0.6	*litchfield*
											1							1			3	0.2	24	0.2	*livingstone*
					2		1				1							8			36	2.0	194	1.8	*manhattan*
		1																			4	0.2	25	0.2	*miami*
					5																7	0.4	14	0.1	*mississippi*
																1				1	20	1.1	176	1.7	*montevideo*
		2			1	1	6	1					5					7			50	2.7	162	1.5	*muenchen*
																				1	2	0.1	15	0.1	*newington*
3	1	3			7	1	16	1			1		1			1	2	10		1	103	5.6	542	5.1	*newport*
	2				1		3						1					1			29	1.6	167	1.6	*oranienburg*
						1	4				2							2		6	29	1.6	93	0.9	*panama*
							2				4							1			16	0.9	98	0.9	*paratyphi B*
																1	2	2			6	0.3	99	0.9	*reading*
	1				1		4		1							5	1	7		1	73	4.0	442	4.2	*saint-paul*
1					1											3		3			9	0.5	83	0.8	*san-diego*
		1																			7	0.4	36	0.3	*schwarzengrund*
		1					1											1			7	0.4	98	0.9	*senftenberg*
		1			1																5	0.3	35	0.3	*tennessee*
1	1	2			4		1				2							1		1	51	2.8	314	3.0	*thompson*
1	3				3	2	2					3						6			34	1.8	240	2.3	*typhi*
3	15	4		5	10	1	17		10		11		3	1		5	5	50	1	3	493	26.8	2674	25.3	*typhimurium*
				1	5												1				25	1.4	176	1.7	*typhimurium v cop*
																				23	23	1.2	65	0.6	*weltevreden*
													1					1			2	0.1	26	0.2	*worthington*
12	37	32	–	15	59	8	103	2	14	–	28	3	22	1	–	30	16	154	2	49	1653	89.8	9510	89.9	TOTAL
1	1	–	8	2	5	1	27	–	–	–	1	12	1	–	1	–	–	17	2	2	188		1064		ALL OTHER*
13	**38**	**32**	**8**	**17**	**64**	**9**	**130**	**2**	**14**	**–**	**29**	**15**	**23**	**1**	**1**	**30**	**16**	**171**	**4**	**51**	**1841**		**10574**		**TOTAL**

TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES, JUNE, 1971

SEROTYPE	REPORTING CENTER																						
	ALK	ARI	ARK	CAL	COL	CON	DEL	DC	GA	HAW	ILL	IND	IOW	KAN	KY	LA	MAS	MIC	MIS	MO	NEB	NEV	NH
albany																							
atlanta									1														
bern																							
berta				12											1			1					
binza			1																				
bovis-morbificans						3											6						
carrau																							
cerro																1							
drypool																1							
eastbourne																							
eimsbuettel											1												
gaminara																							
gatow																							
grumpensis												1								1			
habana																							
hartford																		1					
ibadan			1																				
kentucky					1						1												
kottbus											1												
lomita																							
london				1							1												
madelia																		1					
minnesota																							
muenster																1							
new-brunswick																							
norwich																				1			
oslo										1													
paratyphi A				1						1													
poona																							
rubislaw																							
seegefeld																							
siegburg				2																			
springs																							
stanley							2																
taksony		1																					
urbana						1												1					
westhampton																	1						
TOTAL	–	1	2	16	1	4	2	–	1	2	4	1	–	–	1	3	7	4	–	2	–	–	–
NOT TYPED*	2	–	–	1	–	–	–	11	–	–	1	–	3	1	–	2	–	2	8	–	4	1	8
TOTAL	2	1	2	17	1	4	2	11	1	2	5	1	3	1	1	5	7	6	8	2	4	1	8

* See Table V-A

TABLE II – Continued

REPORTING CENTER														TOTAL	CUMULATIVE TOTAL	SEROTYPE
NM	NYA	NYB	NC	ND	OKL	PA	RI	TEN	TEX	VT	VA	WIS				
											1			1	8	*albany*
														1	6	*atlanta*
								1						1	1	*bern*
											1			15	41	*berta*
														1	3	*binza*
														9	15	*bovis-morbificans*
			1											1	3	*carrau*
														1	6	*cerro*
									3					4	8	*drypool*
									1					1	6	*eastbourne*
														1	2	*eimsbuettel*
									2					2	7	*gaminara*
									1					1	8	*gatow*
														2	3	*grumpensis*
							1		4					5	7	*habana*
											2	1		4	9	*hartford*
									1					2	3	*ibadan*
			1											3	23	*kentucky*
		1	3											5	31	*kottbus*
									1					1	7	*lomita*
														2	14	*london*
														1	3	*madelia*
						1								1	14	*minnesota*
		1												2	13	*muenster*
					1									1	3	*new-brunswick*
														1	4	*norwich*
														1	20	*oslo*
														2	5	*paratyphi A*
									3					3	40	*poona*
									1					1	6	*rubislaw*
		1												1	1	*seegefeld*
									3					5	29	*siegburg*
									1					1	1	*springs*
														2	7	*stanley*
														1	2	*taksony*
				1										3	27	*urbana*
			1											2	3	*westhampton*
–	–	3	6	1	1	1	1	1	21	–	4	1		91	511	TOTAL
12	24	1	–	–	–	–	7	–	6	1	–	2		97	553	NOT TYPED*
12	**24**	**4**	**6**	**1**	**1**	**1**	**8**	**1**	**27**	**1**	**4**	**3**		**188**	**1064**	**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, JUNE, 1971

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
anatum		1				1	2				–
bareilly							–	1			1
blockley							–				–
braenderup							–				–
bredeney							–				–
chester							–				–
cholerae-suis v kun							–				–
cubana							–	2			2
derby							–				–
enteritidis						1	1				–
give							–	2			2
heidelberg	1	4		1			6	1			1
indiana		1					1				–
infantis						2	2				–
java							–				–
javiana							–				–
litchfield							–				–
livingstone							–	1		4	5
manhattan							–				–
miami							–				–
mississippi							–				–
montevideo							–	3			3
muenchen					1	3	4				–
newington							–				–
newport				1			1				–
oranienburg					3		3			6	6
panama							–				–
paratyphi B							–				–
reading		30					30			7	7
saint-paul	1						1				–
san-diego		9					9			1	1
schwarzengrund							–	1			1
senftenberg		1					1	1			1
tennessee							–				–
thompson			1				1				–
typhi							–				–
typhimurium		19		12	6	6	43	4			4
typhimurium v cop				1	2		3				–
weltevreden							–				–
worthington							–				–
TOTAL	2	65	1	15	12	13	108	16	–	18	34
ALL OTHER*	1	6	3	9	1	–	20	7	–	11	18
TOTAL	**3**	**71**	**4**	**24**	**13**	**13**	**128**	**23**	**–**	**29**	**52**

*See Table IV

TABLE III – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS						MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
		EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL				
1			1		1		2		5	191	*anatum*
							–		1	16	*bareilly*
							–		–	121	*blockley*
	1						–		1	13	*braenderup*
							–		–	55	*bredeney*
							–		–	15	*chester*
							–		–	124	*cholerae-suis v kun*
							–		2	50	*cubana*
				2			2		2	48	*derby*
1							–		2	43	*enteritidis*
							–		2	9	*give*
							–		7	262	*heidelberg*
							–		1	9	*indiana*
							–	1	3	140	*infantis*
	3						–		3	39	*java*
	1						–		1	7	*javiana*
							–		–	11	*litchfield*
							–		5	15	*livingstone*
							–		–	35	*manhattan*
							–		–	4	*miami*
							–		–	1	*mississippi*
							–		3	111	*montevideo*
	3						–		7	30	*muenchen*
							–		–	33	*newington*
1							–	1	3	87	*newport*
							–		9	64	*oranienburg*
	5						–		5	11	*panama*
	1						–		1	7	*paratyphi B*
							–		37	182	*reading*
1	3						–		5	203	*saint-paul*
							–		10	121	*san-diego*
							–		1	62	*schwarzengrund*
							–		2	107	*senftenberg*
							–	1	1	51	*tennessee*
	1	8					8		10	96	*thompson*
							–		–	9	*typhi*
6	1						–	2	56	610	*typhimurium*
							–		3	114	*typhimurium v cop*
							–		–	–	*weltevreden*
							–		–	75	*worthington*
10	19	8	1	2	1	–	12	5	188	3181	TOTAL
6	2	–	–	–	–	–	–	3	49	577	ALL OTHER*
16	**21**	**8**	**1**	**2**	**1**	**–**	**12**	**8**	**237**	**3758**	**TOTAL**

TABLE IV. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES, JUNE, 1971

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
adelaide							–				–
ajiobo							–			1	1
akanji							–			1	1
alachua							–	2		1	3
amsterdam							–			1	1
drypool							–			1	1
dublin				7			7				–
johannesburg							–				–
kottbus					1		1				–
london		1					1				–
new-brunswick							–				–
orion							–			1	1
pomona							–				–
poona							–				–
siegburg	1	1					2				–
taksony							–				–
thomasville		1					1				–
typhi-suis			2				2				–
TOTAL	1	3	2	7	1	–	14	2	–	6	8
NOT TYPED*	–	3	1	2	–	–	6	5	–	5	10
TOTAL	**1**	**6**	**3**	**9**	**1**	**–**	**20**	**7**	**–**	**11**	**18**

*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	2	*adelaide*
							–		1	1	*ajiobo*
							–		1	1	*akanji*
							–		3	14	*alachua*
							–		1	4	*amsterdam*
4							–		5	21	*drypool*
							–		7	25	*dublin*
							–	1	1	15	*johannesburg*
							–		1	4	*kottbus*
							–		1	2	*london*
							–	1	1	3	*new-brunswick*
	1						–		1	6	*orion*
1							–		1	1	*pomona*
							–		1	5	*poona*
							–		2	44	*siegburg*
							–	1	1	10	*taksony*
							–		1	22	*thomasville*
							–		2	2	*typhi-suis*
5	2	–	–	–	–	–	–	3	32	490	TOTAL
1	–	–	–	–	–	–	–	–	17	87	NOT TYPED*
6	2	–	–	–	–	–	–	3	49	577	TOTAL

TABLE V. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY, JUNE, 1971

A. HUMAN SOURCES

REPORTING CENTER	GROUP															TOTAL
	A	B	C		C1	C2	D		E4	G	L		P	UNK		
ALASKA					2											2
CALIFORNIA									1							1
DISTRICT OF COLUMBIA	1	6	1		1									2		11
ILLINOIS													1			1
IOWA		2	1													3
KANSAS									1							1
LOUISIANA		2														2
MICHIGAN			1											1		2
MISSISSIPPI		5			1					1				1		8
NEBRASKA		1				2	1									4
NEVADA		1														1
NEW HAMPSHIRE		2				3	1							2		8
NEW MEXICO		8			2	2										12
NEW YORK–A														24		24
NEW YORK–BI											1					1
RHODE ISLAND		4				2								1		7
TEXAS		4				1								1		6
VERMONT							1									1
WISCONSIN														2		2
TOTAL	1	35	3		6	10	3		2	1	1		1	34		97

B. NONHUMAN SOURCES

SOURCES	GROUP															TOTAL
	A	B	C		C1	C2	D		E4	G	L		P	UNK		
DOMESTIC ANIMALS AND THEIR ENVIRONMENT		2				1								3		6
ANIMAL FEEDS					10											10
WILD ANIMALS AND BIRDS		1														1
REPTILES AND ENVIRONMENT																–
HUMAN DIETARY ITEMS																–
MISCELLANEOUS																–
TOTAL	–	3	–		10	1	–		–	–	–		–	3		17

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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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