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CENTER FOR DISEASE CONTROL

# SALMONELLA

**SURVEILLANCE**

## CONTENTS . . .

FOR THE MONTH OF AUGUST 1970

- I. SUMMARY
- II. REPORTS OF ISOLATIONS
- III. CURRENT INVESTIGATIONS
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- V. SPECIAL REPORTS
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# 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 August 1970, 2,529 isolations of salmonellae were reported from humans, an average of 633 isolations per week (Tables I, II, and V-A). This number represents an increase of 130 (25.8 percent) over the weekly average of July 1970 and an increase of 109 (20.8 percent) over the weekly average of August 1969.

Reports of 673 nonhuman isolations of salmonellae were received during August 1970 (Tables II, IV, and V-B).

## II. REPORTS OF ISOLATIONS

The ten most frequently reported serotypes during August:

HUMAN				NONHUMAN			
Serotype	Number	Percent	Rank Last	Serotype	Number	Percent	
			Month				
1 <u>typhi-murium*</u>	624	24.7	1	<u>typhi-murium*</u>	154	22.9	
2 <u>enteritidis</u>	305	12.1	2	<u>heidelberg</u>	53	7.9	
3 <u>heidelberg</u>	176	7.0	4	<u>saint-paul</u>	53	7.9	
4 <u>newport</u>	174	6.9	3	<u>anatum</u>	33	4.9	
5 <u>saint-paul</u>	170	6.7	6	<u>oranienburg</u>	32	4.8	
6 <u>thompson</u>	137	5.4	7	<u>montevideo</u>	28	4.2	
7 <u>infantis</u>	109	4.3	5	<u>cholerae-suis</u>			
				<u>var. kunzendorf</u>	27	4.0	
8 <u>typhi</u>	66	2.6	>10	<u>infantis</u>	26	3.9	
9 <u>blockley</u>	63	2.5	8	<u>newport</u>	21	3.1	
10 <u>javiana</u>	50	2.0	>10	<u>thompson</u>	21	3.1	
Total	1874	74.1		Total	448	66.6	
TOTAL (all serotypes)	2529			TOTAL (all serotypes)	673		
*Includes <u>var. copenhagen</u>	25	1.0		*Includes <u>var. copenhagen</u>	16	2.4	

## III. CURRENT INVESTIGATIONS

### A. Salmonella enteritidis Outbreak in a Convalescent Home - Maryland

Reported by Robert E. Farber, M.D., Commissioner of Health, and other members of the Baltimore City Health Department; Niel Solomon, M.D., Ph.D., Maryland State Secretary of Health and Mental Hygiene; Howard J. Garber, M.D., Chief Division of Communicable Diseases, Maryland State Department of Health;

Gilford Ashitey, M.D., Visiting A.I.D. Fellow at CDC; Thoburn A. Dadisman, Jr., M.D., EIS Officer located at the Maryland State Department of Health; John N. Lewis, M.D. and Robert E. Koehler, M.D., EIS Officers, Bacterial Diseases Branch, and the Epidemiological Services Laboratory Section, Epidemiology Program, CDC.

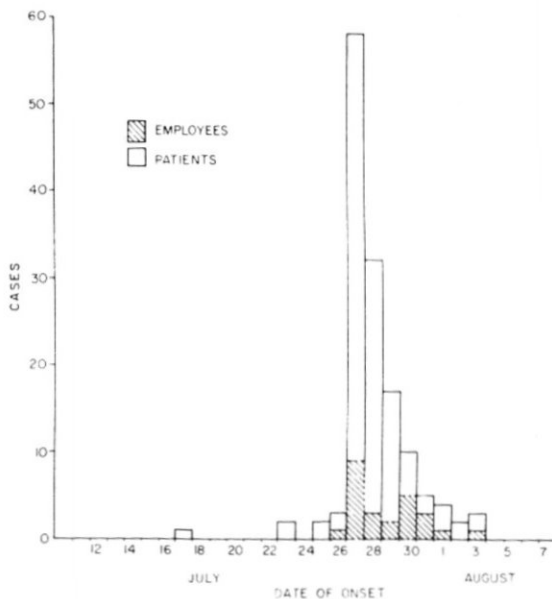
Between July 26 and August 3, 1970, an outbreak of febrile gastroenteritis occurred among patients and employees in a convalescent home for the aged in Baltimore, Maryland. At least 107 of 145 patients (74 percent) and 25 of 75 employees (33 percent) are known to have developed diarrhea or upper gastrointestinal symptoms with fever over a 10-day period beginning July 26 (Figure 1). Salmonella enteritidis was cultured from stools of 43 patients and 19 employees. The patient population ranged in age from 49 to 100 years, with an average age of 78 years. Most patients were debilitated due to underlying chronic illness. Twenty-nine excess deaths occurred among 107 ill patients during the month following the onset of the outbreak (estimated case fatality ratio = 27.1 percent). There were no deaths among the employees.

No single food item could be conclusively incriminated, and food cultures were negative. However, food specific attack rates suggested bread pudding served on July 26 as a possible source of infection, even though the total number of patients available for questioning was too small to be significant. Also, diabetic patients who did not receive this pudding had a significantly lower attack rate than patients on alternate diets. Investigation of the water available in the nursing home and neighboring buildings by millipore filtration did not reveal contamination with salmonella or coliforms.

Follow-up investigation of reported diarrheal illness in several private homes in the neighborhood of the initial outbreak and from three other Baltimore nursing homes did not suggest salmonella infection, either clinically or culturally. A telephone survey of other nursing homes in Baltimore which included a total of 3,134 patients revealed a reported prevalence of 16 cases of diarrhea per 1,000 patients over the 2-week period beginning July 26. Two of 198 rectal swab cultures taken at random from this same population were positive for salmonella; both were serotypes other than S. enteritidis. One was S. blockley and the other S. cerro.

EDITOR'S COMMENT: Mortality rates in humans infected with salmonellae are usually quite low. In the years 1962-1969, 53 deaths were reported among 20,161 persons involved in 238 salmonellosis outbreaks, giving a case fatality ratio of .26 percent. The unusual severity of this outbreak (case fatality ratio = 27.1 percent) can be attributed to the advanced ages and debilitated condition of the convalescent home patients.

FIGURE 1  
GASTROENTERITIS IN A NURSING HOME, JULY-AUGUST 1970



## B. Salmonellosis Following a Wedding Anniversary Dinner - New York

Reported by Jack J. Goldman, M.D., Commissioner of Health, E. Franklin Hall, M.D., First Deputy Commissioner of Health, Judith Keller, M.D., Deputy Commissioner of Health, Daniel V. Winslow, Senior Sanitarian, and Gracie L. Edwards, Assistant Director of Public Health Nursing, Elizabeth Pulliam, and Joyce Fiore, Nurses, Westchester County Department of Health; Alan R. Hinman, M.D., Director, Bureau of Epidemiology, New York State Department of Health; Sylvan Fish, M.D., Consultant in Communicable Diseases, Philadelphia Health Department; Gilford Ashitey, M.D., Visiting A.I.D. Fellow at CDC; and John N. Lewis, M.D., EIS Officer, Bacterial Diseases Branch, Epidemiology Program, CDC.

An outbreak of gastroenteritis occurred in Westchester County, New York, on August 8, 1970, following an anniversary dinner attended by approximately 400 guests. Most of the guests were from towns in Westchester County, but some were from other states. Onset of symptoms was 24-48 hours after the anniversary dinner (Figure 2). Of those persons interviewed, 63 of 106 (59 percent) guests and eight of 13 (62 percent) food handlers reported being ill. Their symptoms included diarrhea (100 percent), abdominal cramps (85 percent), fever (63 percent), and headache (52 percent); some of the persons required hospitalization, but there were no fatalities. Salmonella enteritidis was cultured from 40 of 46 rectal swabs of guests and food handlers, including both symptomatic and asymptomatic persons.

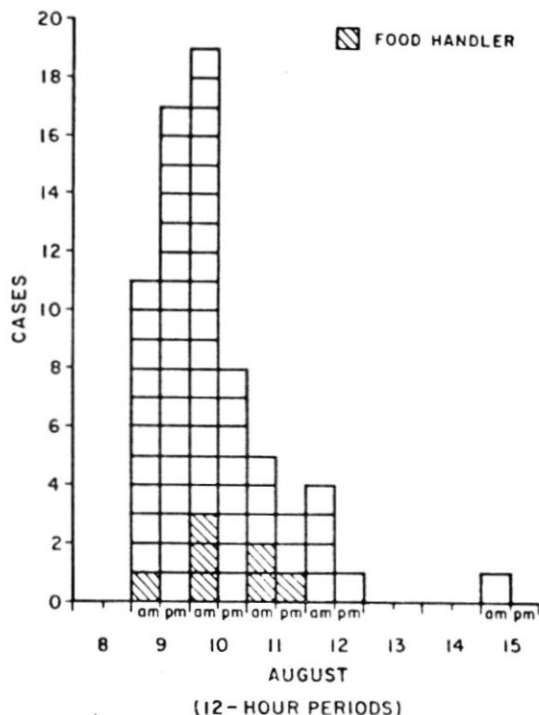
The dinner consisted of champagne, fruit cup, cornish hen, dressing, gravy, candied sweet potatoes, string beans, rolls, coffee, ice cream, and cake. All reports suggested that the food was thoroughly cooked. Food histories from 106 persons implicated the cornish hen as the most likely vehicle of infection (Table 2).

The food had been prepared by a private individual using a small church kitchen. Facilities for food preparation and storage in the kitchen were found to be inadequate for a dinner of this magnitude as were the facilities at the individual's home where the food was stored both before and after cooking. S. enteritidis was cultured from leftover cornish hen, candied sweet potatoes, and swabs taken from the handle of the refrigerator and the floor of the hall in which the dinner was served. A hen purchased by another customer at the same supermarket from the same batch as that used for the dinner was also found to be positive for S. enteritidis.

Table 1  
Food Histories from 106 Guests - Westchester, New York, August 1970

Food or Beverage	Persons Who Ate Specified Food				Persons Who Did Not Eat Specified Food			
	Ill	Not Ill	Total	Attack Rate (Percent)	Ill	Not Ill	Total	Attack Rate (Percent)
Cornish hen	60	31	91	66	3	12	15	20
Dressing	55	28	83	66	8	15	23	35
Gravy	55	25	80	69	8	18	26	31
Candied sweet potatoes	57	28	85	67	6	15	21	29
String beans	56	31	87	64	7	12	19	37
Rolls	51	36	87	57	12	15	27	44
Fruit cup	58	33	91	64	5	10	15	33
Cake	52	28	80	65	11	15	26	42
Ice cream	50	28	78	64	13	15	28	46
Coffee	20	11	31	65	43	32	75	57
Cream	18	10	28	64	45	33	78	58
Champagne	48	30	78	62	15	13	28	54

Figure 2  
 CASES OF SALMONELLOSIS BY DATE OF ONSET  
 NEW YORK - AUGUST 8-15, 1970



#### IV. REPORTS FROM THE STATES

##### A. A Salmonella enteritidis Outbreak Traced to a Restaurant - Pennsylvania

Reported by William D. Schrack, Jr., M.D., Director, Division of Communicable Diseases, Pennsylvania Department of Health; Frank B. Clack, V.M.D., Director, Hugh B. Robins, M.D., Chief, Medical Services, William G. Lord, D.V.M., Public Health Veterinarian, Joseph Sarandria, Director of Laboratory, and Charles R. Stowell, Public Health Officer, Allegheny County Health Department; and Ronald H. Goldenson, M.D., EIS Officer located at the Pennsylvania Department of Health.

On August 2, 1970, an outbreak of febrile gastroenteritis was reported among persons who ate food from a restaurant in Allegheny County, Pennsylvania. The ill persons included individuals at two wedding receptions, many dinner groups, and employees at the restaurant. Over a 1-week period 130 cases of illness were recorded (Figure 1). The mean incubation period was 18 hours. While there were no deaths, the clinical presentation was quite severe with 30 persons requiring hospitalization. The median duration of illness was 12 days, including 7 days of bedrest.

Food histories were obtained from 93 ill and 26 asymptomatic persons. Food specific attack rates implicated cold foods as the vehicles of infection. Ninety-three percent of those eating potato salad, cold cuts, or tossed salad became ill, whereas only 5 percent of those who did not eat any of these foods became ill (Table 2). All three of these cold food items had been prepared on the same wooden preparation table.

Salmonella enteritidis was recovered from stool specimens from 64 restaurant clients and 24 employees, as well as from samples of leftover potato salad, sliced ham, and scrapings from the wooden preparation table. Among the 24 culture-positive foodhandlers, 13 had been ill and 11 remained asymptomatic. Thirty-three of 38 persons, including all foodhandlers with illness or positive stool cultures, had indication of prior infection by positive serology for the Group D antigen.

The precise way in which S. enteritidis was introduced into the restaurant, whether by person or object, could not be determined. Epidemiologic and bacteriologic evidence pointed to the wooden preparation table as the common source of contamination in the outbreak.

The restaurant voluntarily closed until all employees positive for salmonellae could be identified and relieved of their responsibilities of food preparation, and until a thorough investigation and cleaning of the kitchen and restaurant facilities could be accomplished. As an additional preventive measure, the Pennsylvania Department of Health sent a letter to each client and employee who was ill, acquainting him with information about salmonella food poisoning, including its clinical presentation, mode of transmission, and the precautions necessary to prevent secondary cases.

Figure 3  
FEBRILE GASTROENTERITIS BY DATE OF ONSET  
ALLEGHENY COUNTY, PENNSYLVANIA  
JULY 20-AUG. 10, 1970

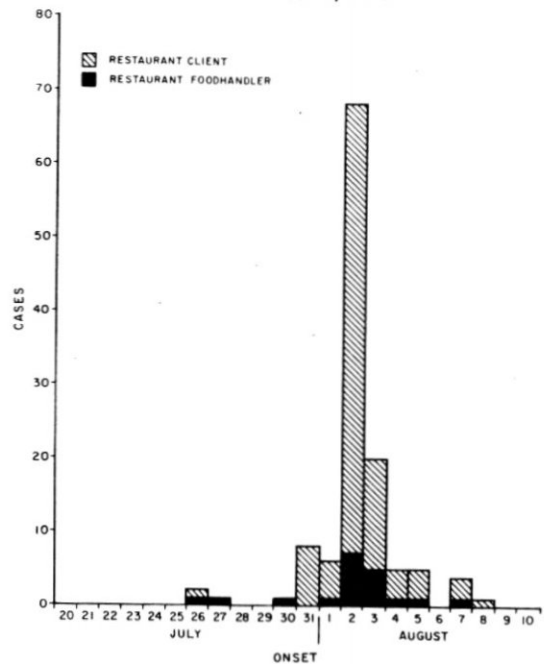


Table 2  
Food Histories

Food Items	Total Persons	Number Persons Who ATE Specified Food				Number Who Did NOT Eat Specified Food			
		Ill	Not Ill	Total	Attack Rate (Percent)	Ill	Not Ill	Total	Attack Rate (Percent)
1. Potato salad	119	68	0	68	100	25	26	51	49
2. Sliced cold meats, cheese	119	70	3	73	96	23	23	46	50
3. Potato salad, cold-cuts, and tossed salad*	119	92	7	99	93	1	19	20	5
4. Fried Chicken	119	35	2	37	95	58	24	82	70
5. Pickles, olives and/or relishes	119	15	4	19	79	78	22	100	78
6. Hot seafood	119	9	14	23	38	84	12	96	87
7. Hot meats	119	9	6	15	60	84	20	104	81
8. Baked beans	119	17	1	18	94	76	25	101	75

\*Foods prepared on the same wooden preparation table, including Food Item 1 (Potato Salad), Food Item 2 (Sliced Cold Meats, Cheese), and Tossed Salad.



B. A Salmonella typhi-murium Infection Traced to Goslings - Washington

Reported by Herb W. Anderson, B.S., R.S., Environmental Epidemiologist  
and Donald R. Peterson, M.D., M.P.H., Director of Epidemiology,  
Seattle-King County Department of Health.

On May 30, 1970, an 18 year old Edmonds, Washington, youth experienced diarrhea, abdominal pain, fever, vomiting and bloody stools lasting 3 days. The Washington State Health Department Laboratory isolated S. typhi-murium from the patient's rectal swab specimen. Stool specimens from his parents and a 14-year-old brother, who were asymptomatic, were negative for salmonellae.

Earlier in the month, the family had purchased four goslings from a feed and garden store and five ducklings from a local farmer. Droppings from their separate cages were cultured by the Seattle-King County Health Department Laboratory and yielded S. typhi-murium. At the feed and garden store, droppings from goslings remaining to be sold also yielded S. typhi-murium. However, at the farm, droppings from ducklings and samples of feed were negative for salmonellae.

The feed and garden store obtained the goslings from a woman residing in Lake Stevens, Washington. The woman operated a part-time hatchery in her home. She admitted no illness; her stool culture was negative for salmonellae.

She obtained hatching eggs from neighboring farms and from her own flock of geese. Duck, chicken, and guinea eggs were also hatched in her incubator. After hatching, the goslings were put in wire pens located in the woman's bedroom. These pens also contained ducklings, chicks and guineas. The room, pens and equipment were not cleaned nor disinfected between broods.

On sunny days, the pens containing the newly hatched birds were taken outdoors and placed on the front porch and lawn of the home. Droppings from pens located at these sites containing 4-day old goslings, ducklings, chicks, and guineas all yielded S. typhi-murium.

Feed samples taken from the top of an open feed sack located in the bedroom yielded S. typhi-murium. However, feed samples taken from the interior portion of a sack were negative for salmonellae. Thirteen samples of feed from unopened sacks in two retail stores also failed to yield salmonellae, suggesting that the feed in the bedroom became contaminated after opening the sack.

The Enteric Bacteriology Unit, Laboratory Division, Center for Disease Control, reported S. typhi-murium cultures from all sources were of the same phage type, a variation of phage type 1 a. Environmental swabs and samples obtained from the incubator, unhatched eggs, pond water and droppings from adult birds were negative for salmonellae.

It appears that the young man acquired his infection by handling infected pet goslings. The goslings were probably infected through contact with contaminated pens and equipment in the home hatchery. This environment infected each new brood.

As a result of this investigation, sanitary improvements were made in the hatchery facilities to avoid possible repetition of similar infections.

## 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. Aserkoff B, Schroeder SA, Brachman PS: Salmonellosis in the United States-- A Five Year Review. Amer J Epid 92:1:13
2. Assoku RKG, Penhale WJ, Buxton A: Haematological Changes in Acute Experimental Salmonella gallinarum Infections in chickens. J Comp Path 80:3:473
3. Bergstrand CG, Nilsson KO: Neonatal Meningitis caused by Salmonella thompson. Acta Paediatrica Scandinavia 59:4:427
4. Chung, GT, Frost AJ: The chemotherapy of experimental Salmonella cholerae-suis infection in mice. J Med Microbiol 3:303
5. Feigin, RD: Salmonella Everywhere: Epidemiologic, Diagnostic, and Therapeutic Dilemmas. Clin Pediatrics 9:527
6. Hawbecker DE, Handy MK, Carpenter JA: Toxigenesis and Infection of Mice by Salmonella enteritidis. Proceed Soc Exp Biol Med 134:2:390
7. Hornick RB, Greisman SE, Woodward TE, Dupont HL, Dawkins AT, Snyder MJ: Typhoid Fever: Pathogenesis and Immunologic Control (First of Two Parts). New Eng J Med 283:686
8. Le Minor L, Rhode R, Taylor J: Nomenclature des Salmonella. Annales de l'Institut Pasteur 119:206, 1970
9. Ley FJ, Kennedy TS, Kawashima K, Roberts D, Hobbs BC: The use of gamma radiation for the elimination of salmonella from frozen meat. J Hyg 68:2:293
10. Neu HC, Winshell EB: Purification and Characterization of Penicillinases from Salmonella typhi-murium and Escherichia coli. Arch Biochem and Biophy 139:278
11. Sato G, Miyamae T, Miura S: A long-term epizootiological study of chicken salmonellosis on a farm with reference to elimination of paratyphoid infection by cloacal swab culture test. Jap J of Vet Res 18:47
12. Timoney J, Kelly WR, Hannan J, Reeves D: A Study of Salmonella Contamination in Some Dublin Poultry Processing Plants. Vet Record 87:158, 1970
13. Voogd CE, Guinee PAM, Manten A, Valkenburg JJ: Incidence of resistance to tetracycline, chloramphenicol, and ampicillin among salmonella species isolated in the Netherlands in 1967 and 1968. Antonie Van Leeuwenhoek J Microb and Serology 36:2:297-304, 1970

B. Recalls of Products Contaminated with Salmonellae for Period July 27, 1970, to October 28, 1970 (reported by the U. S. Food and Drug Administration).

From July 27, 1970 to October 28, 1970, seven 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.	Depth of Recall	Product Distribution	Serotype	Use
8/5	Bravo Enriched Folded Egg Noodles labeled "Spinach Egg Noodles"	(Mfr.) Alfonso Gioia & Sons, dba Bravo Macaroni Co., Rochester, N. Y.	All lots of Spinach Egg Noodles	Retail	Western N.Y., Ohio, Pa., Mich., Ill., Mass.	<u>S. schwarzengrund</u>	Food
8/26	French's Ground Thyme	(Mfr.) R. T. French Co., Rochester, N. Y.	K039 K049 K059	Retail	National	<u>S. newport</u>	Spice
9/9	O'Henry Nut Roll Candy Bars	(Mfr.) Williamson Candy Co., Div. Warner-Lambert Pharm. Co., Chicago, Ill.	Case Code 1860D 1860N 2660D 2660N	Retail	National	<u>S. montevideo</u>	Candy
9/23	Quick Frozen Shrimp, Product of India	(Importer) Arista Industries, Inc., New York, N. Y.	72631 76322 01837 01839	Retail	New York, Ga., Mass., Maryland	<u>S. virchow</u>	Food
	Bravo Egg Macaroni	(Mfr.) Bravo Macaroni Co., Rochester, N. Y.	82570	Retail	Conn., Pa.	<u>S. anatum</u>	Food
9/30	Burkey Creamery Dried Buttermilk	(Mfr.) Burkey Creamery Co., Cushing, Oklahoma	All	Wholesale	Dallas, Texas vicinity	<u>S. cubana</u>	Food
10/28	Hi-Point Pasteurized Whole Egg	(Mfr.) Hi-Point Industries, Los Angeles, California	0334	Wholesale	Honolulu, Hawaii	<u>S. thompson</u>	Food

### C. Possible Transmission of Salmonella by Sigmoidoscope - California

Reported by Harold E. Pearson, M.D., Epidemiologist, Los Angeles County, University of Southern California Medical Center; and William J. Grant, M.D., Assistant Professor Medicine, University of Southern California.

This report was first printed in California Medicine and is abstracted here with the editor's permission.

On April 22, 1968, Patient A, a 64-year-old diabetic woman, was admitted to the diabetic ward of the Los Angeles County Hospital for treatment of osteomyelitis (Staphylococcus aureus and Proteus) of one foot and ketoacidosis. On April 30, the foot was amputated. Three days later, because of constipation, she received an enema (disposable type) and passed a large stool. The following day, she complained of rectal pain and was incontinent of blood-flecked feces. Consequently, on May 5, sigmoidoscopy, using the diabetic ward's sigmoidoscope, was performed. Although no stool culture was obtained, a rectal biopsy taken at that time showed acute and chronic inflammation. Because a rectal stricture was thought to be present, the patient was taken from the diabetic to the medical ward on May 8 for a repeat sigmoidoscopy. The medical ward's sigmoidoscope was used, and rectal swabs which were taken immediately after the procedure yielded Salmonella lomita. Numerous stool specimens obtained during the next 10 days were negative for salmonellae.

On May 4, 1968, Patient B, a 71-year-old male, was admitted to the medical ward of the same hospital with complaints of dysuria for 1 month and cramping abdominal pain and diarrhea for 7 days. A urethral stricture was noted and catheterization at that time revealed a scant growth of E. coli and nonhemolytic streptococci in the urine. On May 6, the patient underwent sigmoidoscopy on the medical ward; no stool culture was obtained. On May 9, urine cultures yielded beta streptococci, nonhemolytic streptococci, and Salmonella lomita. On May 13, the patient was again sigmoidoscoped on the medical ward and fecal specimens obtained at that time yielded S. lomita. The patient also had several subsequent stool cultures positive for S. lomita.

The same sigmoidoscope was used on a third patient on May 11 after use on Patients A and B, but this patient was lost to follow-up and it is not known if he was infected with S. lomita.

Salmonella lomita is uncommon. In 1969, there were 15 isolations in the United States and only six the preceding year. Although salmonella serotypes have been recorded for the past 6 years in the Los Angeles County Hospital and for the past 4 years in Los Angeles County, there were no previously reported isolations of S. lomita in the county or the hospital.

After use on the medical ward, the sigmoidoscope is customarily washed with 5 percent Amphyl (phenolic disinfectant), soaked for an unknown period of time (supposedly 20 to 60 minutes) in 2 percent Staphene (phenolic disinfectant) and finally rinsed with water. Despite this treatment, the only potential mechanism for the transfer of the infection discovered in the environment was the sigmoidoscope used on Patient B on May 6 and May 13, and on Patient A on May 8.

EDITOR'S COMMENT: As the authors pointed out, the easiest answer to the problem of disinfection of sigmoidoscopes is to use disposable instruments whenever practical. If instruments are to be reused, they should be autoclaved. If the sigmoidoscope cannot be autoclaved, vigorous and meticulous cleaning with a detergent solution followed by gas sterilization or adequate disinfection is suggested. Ethylene oxide gas, when available, or soaking in activated gluteraldehyde or a formaldehyde-alcohol solution for at least 10 minutes is recommended.

VI. INTERNATIONAL  
None.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, AUGUST, 1970

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	OH	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA
<i>anatum</i>				1						3			2				1												1	4		
<i>bareilly</i>									1				1			1		1														
<i>blockley</i>	2					2		4	8	2		2	8	3	5	1							1	2		1		1	7	2		
<i>braenderup</i>									1	1				2											1					3		
<i>bredeney</i>							1	1					1	1	1										1					1		
<i>chester</i>										3			1												1		1					
<i>cholerae-suis v kun</i>														2																1	1	
<i>cubana</i>													2																	1	1	
<i>derby</i>									1	1		1	5	1	1				1						3				1	3	1	
<i>enteritidis</i>				18	1	2		7	8	9	38	4	2	14	9	8	8		4			1	1	1	89	13	2	5	1	17	2	
<i>give</i>																																
<i>heidelberg</i>				3		1		6	7	7	33	5	2	16	3	7	1	1	1					2		2		3	10	7		
<i>indiana</i>									2		1			2										1		1				4		
<i>infantis</i>				5		2		4		1	8	5	2	5	6	10		1	2		1		1			5		5	4	7		
<i>java</i>				1				2	1	1	1			1		4	1	1										2				
<i>javiana</i>				1								1					1											1	10	14		
<i>litchfield</i>						1		1		1	1			2		1													1	2		
<i>livingstone</i>												1			1																	
<i>manhattan</i>									1		1	5	2		3			3						2		1	2	1	2			
<i>miami</i>																															1	
<i>mississippi</i>														1		1										2		2	5			
<i>montevideo</i>				1		1		1	3	1	8			4		3													4	3		
<i>muenchen</i>				2					1		3			4	2				1						1		1		14	7		
<i>newington</i>										1							1		1													
<i>newport</i>				2		2		2	2	1	6	5	4	10	2		4			1				1		2		1	8	14	18	
<i>oranienburg</i>				1		1	1				1	1	1	2	2	2													1	5		
<i>panama</i>											2							1												1		
<i>paratyphi B</i>				1								3		1	2		1															
<i>reading</i>	1							1																					3	2		
<i>saint-paul</i>	1	1	2			2		2	5	8	15	6	3	7	10	35	1		1				2	1	8	2	1	11	4	13		
<i>san-diego</i>			1						1		2			1	2																1	
<i>schwarzengrund</i>				2																												
<i>senftenberg</i>									1					1																	1	
<i>tennessee</i>													1	1													2					
<i>thompson</i>	1	1	4			1		4	1	45	12	4		8	6	1	3		2				1		1	1	6	3	8			
<i>typhi</i>						2	1			2	1	9		7	1		1		4							3	1	3	2	1	5	
<i>typhimurium</i>	2		1	26	1	15		16	12	15	52	5	12	25	19	49	13	5	5		2		7	1	15	1	25	44	29	14		
<i>typhimurium v cop</i>	1			2		8				2					4					1												
<i>weltevreden</i>																																
<i>worthington</i>																																
<b>TOTAL</b>	<b>8</b>	<b>-</b>	<b>4</b>	<b>72</b>	<b>2</b>	<b>40</b>	<b>3</b>	<b>52</b>	<b>53</b>	<b>99</b>	<b>197</b>	<b>52</b>	<b>29</b>	<b>132</b>	<b>80</b>	<b>128</b>	<b>37</b>	<b>13</b>	<b>23</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>14</b>	<b>6</b>	<b>128</b>	<b>2</b>	<b>61</b>	<b>3</b>	<b>97</b>	<b>1</b>	<b>133</b>	<b>126</b>
<b>ALL OTHER *</b>	<b>-</b>	<b>8</b>	<b>-</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>17</b>	<b>4</b>	<b>8</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>8</b>	<b>3</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>-</b>	<b>8</b>	<b>-</b>	<b>8</b>	<b>1</b>
<b>TOTAL</b>	<b>8</b>	<b>8</b>	<b>4</b>	<b>76</b>	<b>4</b>	<b>42</b>	<b>20</b>	<b>56</b>	<b>61</b>	<b>102</b>	<b>201</b>	<b>54</b>	<b>30</b>	<b>140</b>	<b>83</b>	<b>128</b>	<b>37</b>	<b>13</b>	<b>24</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>14</b>	<b>7</b>	<b>129</b>	<b>7</b>	<b>66</b>	<b>3</b>	<b>105</b>	<b>1</b>	<b>141</b>	<b>142</b>

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 83 cultures.

\* See Table II.

TABLE I - Continued

GEOGRAPHIC DIVISION AND REPORTING CENTER																				TOTAL	% OF TOTAL	CUMU-LATIVE TOTAL	% OF CUMU-LATIVE 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			2	1	2											2		6	26	1.0	128	0.9	<i>anatum</i>
		2			1																7	0.3	37	0.3	<i>bareilly</i>
		2					1				1		2					1		2	63	2.5	422	2.9	<i>blockley</i>
		1																			9	0.4	45	0.3	<i>braenderup</i>
		1																		4	13	0.5	114	0.8	<i>bredeney</i>
													1					1			8	0.3	51	0.4	<i>chester</i>
																					—	—	13	0.1	<i>cholerae-suis v kun</i>
		1									1										6	0.2	87	0.6	<i>cubana</i>
		3	2	3	1		1				1					1		4		11	38	1.5	303	2.1	<i>derby</i>
							1		8							2	11	11			305	12.1	1318	9.2	<i>enteritidis</i>
		1			2		2											1			6	0.2	41	0.3	<i>give</i>
		2	6		1	2	9				6		7	1		5		18		2	176	7.0	1114	7.8	<i>heidelberg</i>
		1																			12	0.5	67	0.5	<i>indiana</i>
1		3			1		2		5		5		4			1	2	9		2	109	4.3	764	5.3	<i>infantis</i>
1	2	1		1	1												1	7			29	1.1	232	1.6	<i>java</i>
	1			3	3	1	13														50	2.0	174	1.2	<i>javana</i>
					1																14	0.6	122	0.9	<i>litchfield</i>
							1														4	0.2	18	0.1	<i>livingstone</i>
1		1																			31	1.2	225	1.6	<i>manhattan</i>
																					1	0.0	23	0.2	<i>miami</i>
					4																15	0.6	45	0.3	<i>mississippi</i>
					3		2									2		9			45	1.8	241	1.7	<i>montevideo</i>
		3			1	2	2				1							3			48	1.9	160	1.1	<i>muenchen</i>
1	1	4		2	19	1	22		1	3			1			1		28		1	5	0.2	22	0.2	<i>newington</i>
																					6	6.9	964	6.7	<i>newport</i>
		1				2	3														27	1.1	229	1.6	<i>oranienburg</i>
						1	4						1								29	1.1	126	0.9	<i>panama</i>
							1														10	0.4	116	0.8	<i>paratyphi B</i>
1		2														4	2				16	0.6	100	0.7	<i>reading</i>
1	1	1			4											10	4	8			170	6.7	683	4.8	<i>saint-paul</i>
		1									1										18	0.7	185	1.3	<i>san-diego</i>
																					3	0.1	36	0.3	<i>schwarzengrund</i>
					2																5	0.2	40	0.3	<i>sentenberg</i>
											1										5	0.2	32	0.2	<i>tennessee</i>
		2			1	2	4	1								3		9		2	137	5.4	616	4.3	<i>thompson</i>
2	3			4	1	1	4				1	1		1				4		1	66	2.6	313	2.2	<i>typhi</i>
	18	14			7	3	28	11	2		8		7		1	7	11	56		15	599	23.7	3447	24.1	<i>typhimurium</i>
	1			1	5																25	1.0	177	1.2	<i>typhimurium v cop</i>
																					8	0.3	58	0.4	<i>weltevreden</i>
																					2	0.1	36	0.3	<i>worthington</i>
8	40	46	3	13	62	13	104	12	15	1	29	1	23	2	1	35	32	192	—	81	2314	91.5	12924	90.3	TOTAL
—	1	2	14	13	1	—	23	—	—	2	2	26	2	—	—	2	2	9	3	2	215		1391		ALL OTHER*
8	41	48	17	26	63	13	127	12	15	3	31	27	25	2	1	37	34	201	3	83	2529		14315		TOTAL



TABLE II. OTHER SALMONELLAE REPORTED FROM HUMAN SOURCES, AUGUST 1970

SEROTYPE	REPORTING CENTER																							
	ALA	ALK	ARI	ARK	CAL	COL	CON	DEL	DC	FLA	GA	HAW	ILL	IND	LA	MD	MAS	MIC	MIS	MO	NH	NJ	NM	
<i>alachua</i>					1												2							
<i>albany</i>						1																		
<i>atlanta</i>											5													
<i>berta</i>			1																					
<i>binza</i>																								
<i>bonn</i>										1														
<i>bovis-morbificans</i>																	1							
<i>bristol</i>										1														
<i>california</i>										1	1													
<i>caracas</i>																								
<i>carrau</i>						1																		
<i>cerro</i>					2							1												
<i>duesseldorf</i>										2														
<i>eimsbuettel</i>										1	1			1										
<i>flint</i>					1																			
<i>gaminara</i>																								
<i>goettingen</i>																								
<i>habana</i>													1											
<i>hartford</i>										5				1										
<i>holcomb</i>																								
<i>ibadan</i>																								
<i>kentucky</i>													1											
<i>kottbus</i>																								
<i>lomita</i>								1																
<i>london</i>																								
<i>meleagridis</i>					1																		1	
<i>molade</i>											1													
<i>muenster</i>																		2						
<i>neuminster</i>																								
<i>norwich</i>				1																1				
<i>nottingham</i>																								
<i>ohio</i>																			1					
<i>oslo</i>												1												
<i>pensacola</i>										1														
<i>poona</i>			1		1		1	1		2				1		1								
<i>potsdam</i>					1																			
<i>rubislaw</i>										2					1									
<i>saphra</i>																								
<i>siegburg</i>													1											
<i>simsbury</i>																								
<i>stanley</i>					1																			
<i>thomasville</i>																								
<i>urbana</i>													2				1					2		
TOTAL	—	—	2	1	8	2	2	1	—	16	8	2	7	1	1	1	4	3	—	1	—	3	—	
NOT TYPED*	2	3	—	12	1	—	—	—	5	—	—	—	1	—	—	—	—	—	14	—	8	—	26	
TOTAL	2	3	2	13	9	2	2	1	5	16	8	2	8	1	1	1	4	3	14	1	8	3	26	

\* See Table V-A

TABLE II - Continued

REPORTING CENTER													TOTAL	CUMULATIVE TOTAL	SEROTYPE	
NY	ANY	B	NYC	NC	OHI	ORE	PA	RI	TEN	TEX	VA	WAS				WYO
														3	8	<i>alachua</i>
														1	12	<i>albany</i>
											2			7	15	<i>atlanta</i>
							1			1				3	39	<i>berta</i>
							1							1	6	<i>binza</i>
														1	1	<i>bonn</i>
														1	5	<i>bovis-morbificans</i>
														1	1	<i>bristol</i>
1														2	7	<i>california</i>
														1	2	<i>caracas</i>
				1										2	3	<i>carrau</i>
														3	12	<i>cerro</i>
														2	11	<i>duesseldorf</i>
														3	11	<i>eimsbuettel</i>
														1	1	<i>flint</i>
					1					1				2	9	<i>gaminara</i>
1														1	1	<i>goettingen</i>
														1	2	<i>habana</i>
			1											6	16	<i>hartford</i>
														1	1	<i>holcomb</i>
										1				1	2	<i>ibadan</i>
1														2	25	<i>kentucky</i>
							1		1					2	9	<i>kottbus</i>
												1		1	4	<i>lomita</i>
														1	9	<i>london</i>
														2	10	<i>meleagridis</i>
1				1										1	2	<i>molade</i>
											1			4	14	<i>muenster</i>
														1	1	<i>neuminster</i>
														2	6	<i>norwich</i>
			1											1	2	<i>nottingham</i>
				1										2	5	<i>ohio</i>
														1	16	<i>oslo</i>
			1				1				1			2	6	<i>pensacola</i>
										2				12	57	<i>poons</i>
										1				2	3	<i>potsdam</i>
										3				6	9	<i>rubislaw</i>
										1				1	3	<i>saphra</i>
					1					2		1		5	26	<i>siegburg</i>
			1											1	8	<i>simsbury</i>
				1										1	9	<i>stanley</i>
					1						1			1	5	<i>thomasville</i>
														7	36	<i>urbana</i>
-	4	4	5	2	-	4	-	1	12	5	2	-		102	569	TOTAL
17	-	4	3	-	2	-	2	-	11	-	-	2		113	822	NOT TYPED*
17	4	8	8	2	2	4	2	1	23	5	2	2		215	1391	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, AUGUST, 1970

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
<i>anatum</i>	2	3	6			2	13	4			4
<i>bareilly</i>							—	2			2
<i>blockley</i>	10	3			1		14	1			1
<i>braenderup</i>							—				—
<i>bredeney</i>		3				2	5	1		1	2
<i>chester</i>		5				1	6				—
<i>cholerae-suis v kun</i>			27				27				—
<i>cubana</i>	1						1	6		2	8
<i>derby</i>			2							1	1
<i>enteritidis</i>	5					5	10				—
<i>give</i>		1					1				—
<i>heidelberg</i>	13	36					49	1			1
<i>indiana</i>							—				—
<i>infantis</i>	14			2		1	17	4		1	5
<i>java</i>							—				—
<i>javiana</i>							—				—
<i>litchfield</i>		1					1				—
<i>livingstone</i>		1					1	3			3
<i>manhattan</i>	2	1					3				—
<i>miami</i>							—				—
<i>mississippi</i>							—				—
<i>montevideo</i>	17	2					19	2		1	3
<i>muenchen</i>							—				—
<i>newington</i>					1		1				—
<i>newport</i>		2	1	4	1	2	10				—
<i>oranienburg</i>		1				1	2	6		1	7
<i>panama</i>						1	1				—
<i>paratyphi B</i>							—				—
<i>reading</i>		1					1				—
<i>saint-paul</i>	2	31	5	2			40	7			7
<i>san-diego</i>		12					12				—
<i>schwarzengrund</i>		1					1				—
<i>senftenberg</i>	2	3	1				6	5		5	10
<i>tennessee</i>		1					1	10			10
<i>thompson</i>	10		2	1			13				—
<i>typhi</i>							—				—
<i>typhimurium</i>	13	8	3	65	7	20	116	2		3	5
<i>typhimurium v cop</i>	10			1	1	3	15				—
<i>weltevreden</i>							—				—
<i>worthington</i>	13	2					15	1		1	2
TOTAL	114	118	47	75	11	39	404	55	—	16	71
ALL OTHER*	9	13	6	3	—	3	34	13	—	6	19
TOTAL	123	131	53	78	11	42	438	68	—	22	90

\* 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				
3		1				8	9	4	33	366	<i>anatum</i>
		1	1				—		2	32	<i>bareilly</i>
							2		17	120	<i>blockley</i>
							—		—	18	<i>braenderup</i>
							—		7	101	<i>bredney</i>
							—	1	7	35	<i>chester</i>
							—		27	227	<i>cholerae-suis v kun</i>
		1					—	1	10	81	<i>cubana</i>
				1	1	1	1		5	82	<i>derby</i>
							3	1	14	101	<i>enteritidis</i>
	1		1				—		2	23	<i>give</i>
							1	2	53	557	<i>heidelberg</i>
1							—		1	46	<i>indiana</i>
1		1					1	2	26	258	<i>infantis</i>
1							—		1	24	<i>java</i>
						1	1		1	16	<i>javana</i>
							—		1	10	<i>litchfield</i>
							—		4	42	<i>livingstone</i>
							—		3	27	<i>manhattan</i>
							—		—	8	<i>miami</i>
	1		1				—		1	3	<i>mississippi</i>
1							1	5	28	222	<i>montevideo</i>
							—	1	2	39	<i>muenchen</i>
							—		1	22	<i>newington</i>
1	2						—	8	21	143	<i>newport</i>
	1	1					22	23	32	140	<i>oranienburg</i>
							—	2	4	8	<i>panama</i>
							—		—	2	<i>paratyphi B</i>
		1					1		2	30	<i>reading</i>
3	1	1				1	2		53	387	<i>saint-paul</i>
							—		12	140	<i>san-diego</i>
					1	3	4		5	100	<i>schwarzengrund</i>
			1			2	3		19	185	<i>senftenberg</i>
					1		1		12	157	<i>tennessee</i>
		3			1	3	7	1	21	223	<i>thompson</i>
							—		—	—	<i>typhi</i>
5		1	1	2	1		5	7	138	816	<i>typhimurium</i>
1							—		16	151	<i>typhimurium v cop</i>
							—		—	—	<i>weltevreden</i>
			1				1	1	19	177	<i>worthington</i>
17	6	11	6	3	5	41	66	36	600	5119	TOTAL
3	2	4	2	—	—	6	12	3	73	1147	ALL OTHER*
20	8	15	8	3	5	47	78	39	673	6266	TOTAL



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		1	12	<i>albany</i>
							1		1	2	<i>arkansas</i>
							1		1	1	<i>atlanta</i>
							1		1	2	<i>babelsberg</i>
							1		2	26	<i>binza</i>
1			1				1		1	12	<i>bornum</i>
							1		1	28	<i>california</i>
							1		1	11	<i>carrau</i>
							1		2	12	<i>cholerae-suis</i>
							1		2	45	<i>drypool</i>
							1		2	53	<i>dublin</i>
							1		6	170	<i>eimsbuettel</i>
							1		3	6	<i>gallinarum</i>
							1		1	2	<i>grumpensis</i>
							1		1	3	<i>habana</i>
			1			3	3		5	12	<i>hartford</i>
							1		4	67	<i>kentucky</i>
							1		2	3	<i>london</i>
		1				1	1		1	1	<i>luciana</i>
							1		1	24	<i>meleagridis</i>
1	1					1	1		1	2	<i>michigan</i>
							1	1	2	86	<i>minnesota</i>
							1		1	2	<i>oslo</i>
							1		1	1	<i>portsmouth</i>
							1		5	46	<i>pullorum</i>
		1				1	1		1	6	<i>rubislaw</i>
							1		1	2	<i>saphra</i>
							1		2	46	<i>siegburg</i>
							1	1	2	34	<i>simsbury</i>
							1		1	23	<i>taksony</i>
		1					1	1	4	47	<i>thomasville</i>
							1		2	23	<i>urbana</i>
							1		1	1	<i>welikada</i>
2	2	4	2	-	-	6	12	3	63	1026	TOTAL
1	-	-	-	-	-	-	-	-	10	121	NOT TYPED*
3	2	4	2	-	-	6	12	3	73	1147	TOTAL

TABLE V. SALMONELLAE REPORTED BY GROUP IDENTIFICATION ONLY, AUGUST, 1970

## A. HUMAN SOURCES

REPORTING CENTER	GROUP														TOTAL
	B	C1	C2		D	E	F		G	I	M		UNK		
ALABAMA		2													2
ALASKA	3														3
ARKANSAS	2		7		3										12
CALIFORNIA													1		1
DISTRICT OF COLUMBIA	4												1		5
ILLINOIS	1														1
MISSISSIPPI	8		2			2							2		14
NEW HAMPSHIRE	7		1												8
NEW MEXICO	6	5	9		3				2	1					26
NEW YORK-A													17		17
NEW YORK-C	1				2								1		4
NORTH CAROLINA		3													3
OREGON					2										2
RHODE ISLAND	1												1		2
TEXAS	1	5	1			2	1						1		11
WYOMING	2														2
<b>TOTAL</b>	<b>36</b>	<b>15</b>	<b>20</b>		<b>10</b>	<b>4</b>	<b>1</b>		<b>2</b>	<b>1</b>	<b>-</b>		<b>24</b>		<b>113</b>

## B. NONHUMAN SOURCES

SOURCES	GROUP														TOTAL
	B	C1	C2		D	E	F		G	I	M		UNK		
DOMESTIC ANIMALS AND THEIR ENVIRONMENT	2													4	6
ANIMAL FEEDS											2		1		3
WILD ANIMALS AND BIRDS	1														1
REPTILES AND ENVIRONMENT															-
HUMAN DIETARY ITEMS															-
MISCELLANEOUS															-
<b>TOTAL</b>	<b>3</b>	<b>-</b>	<b>-</b>		<b>-</b>	<b>-</b>	<b>-</b>		<b>-</b>	<b>-</b>	<b>2</b>		<b>5</b>		<b>10</b>

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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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