REPORT NO. 72
May 9, 1968

NATIONAL
COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

CONTENTS. . .

FOR THE MONTH OF MARCH 1968

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE/PUBLIC HEALTH SERVICE
Bureau of Disease Prevention and Environmental Control

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 March 1968, 1,088 isolations of salmonellae were reported from humans, an average of 272 isolations per week (Tables I, II, and V-A). This number represents a decrease of 18 (6.2 percent) from the weekly average of February 1968 and a decrease of 10 (3.5 percent) from the weekly average of March 1967.

Reports of 519 nonhuman isolations of salmonellae were received during March 1968 (Tables III, IV, and V-B).

II. REPORTS OF ISOLATIONS

The ten most frequently reported serotypes during March:

HUMAN					NONHUMAN		
	Serotype	Number	Percent	Rank Last Month	Serotype	Number	Percent
1	typhi-murium*	287	26.4	1	typhi-murium*	96	18.5
2	enteritidis	79	7.3	4	heidelberg	48	9.2
3	heidelberg	75	6.9	3	anatum	34	6.6
4	saint-paul	57	5.2	2	montevideo	34	6.6
5	typhi	54	5.0	8	saint-paul	27	5.2
6	infantis	48	4.4	5	cubana	20	3.9
7	newport	47	4.3	6	infantis	20	3.9
8	blockley	31	2.8	>10	eimsbuettel	17	3.3
9	thompson	28	2.6	9	derby	16	3.1
10	java	24	2.2	>10	thompson	14	2.7
	Total	730	67.1		Total	326	62.8
	TOTAL (all serotypes)	1088			TOTAL (all serotypes)	519	
	*Includes var. copenhagen	22	2.0		*Includes var. copenhagen	23	4.4

III. CURRENT INVESTIGATIONS

NONE

IV. REPORTS FROM THE STATES

NONE

V. SPECIAL REPORTS

A. The Salmonella Problem from an Enforcement Standpoint

The following was included in a paper presented by Mr. Kenneth R. Lennington, Salmonella Project Officer, Office of the Associate Commissioner for Compliance, U.S. Food and Drug Administration, in Washington, D.C., on April 3, 1968, before the 1968 Joint Meeting of the American Oil Chemists Society and American Association of Cereal Chemists:

Section 402 of the Federal Food, Drug, and Cosmetic Act defines a food to be adulterated if it bears or contains any poisonous or deleterious substance which may render it injurious to health, and if it has been prepared, packed, or held under unsanitary conditions whereby it may become contaminated with filth or whereby it may be rendered injurious to health. Foods containing salmonella or other pathogens fall within those definitions.

Salmonellosis as a food-borne disease has been recognized as a major public health problem for the past three decades, but the frequency of isolation and recovery of the organism from prepared foods during the past 2½ years has given public health officials, industry, and the consumer a basis for concern. Salmonella contamination during fiscal year 1967 necessitated recall of 79 lots of foods from the market and 66 lots of drug substances, or finished dosage forms. Several of these recalls were nationwide in scope and involved millions of dollars in product value.

Historically, eggs have been recognized as potential vectors of salmonellae, and occurrence of the pathogen in egg products and the resultant public health implications were illustrated by the outbreaks of salmonellosis associated with dried egg consumption by the British during World War II.

Numerous studies and investigations have clearly established that one of the major reservoirs of salmonellae is our animal and poultry population and that the most common vehicle of human salmonellosis is food. If we look at the reported outbreaks of food-borne disease, we see that the foods most frequently implicated are poultry, eggs and egg products, meat and meat products, and to a lesser extent milk and fish, or prepared foods containing an animal-derived product as an ingredient.

Events during the past 2 years have led to recognition that a number of other foods, or food ingredients, are potential, if not high risk, items from a salmonella standpoint. Dried coconut, dried milk, dried yeast, drug substances of animal origin such as thyroid, pancreatin, pepsin, gelatin, and liver powder, chocolate, and even carmine red color have been found to contain salmonellae. Seldom a month passes that salmonellae are not isolated from a heretofore non-suspect product. Smoked fish, picked crabmeat, shelled nuts, edible gums, and starch have yielded isolations of salmonella in the past year. In many instances, the contamination came to light by reason of a salmonellosis outbreak and a subsequent epidemiologic investigation pointing to the particular food as the vector. Such was the case in the contamination of at least three nonfat dry milks, smoked whitefish, carmine red color, dried coconut, and in some of the contaminated dried yeast episodes. This leads one to speculate how many individual or family infections may occur that are never diagnosed or recognized as salmonellosis. Unfortunately, due to the time consuming laboratory procedures for confirmatory diagnosis, it will be a long time before our diagnostic and reporting systems will be refined to the point where a majority of cases are identified and come to medical and public health attention.

The uncertainty of where salmonellae will crop out, in what product category, in what food or food ingredient appears to be a characteristic of the problem. There are a number of product categories where insufficient investigational work has been performed or reported to rule out their likelihood as potential vectors. A great deal of screening of foods and drugs remains to be done before the extent of salmonella contamination in our food supply can be accurately assessed. The Food and Drug Administration is exploring several product categories, but thus far our limited data cannot be interpreted other than as trend indicators. Of interest, and illustrating the variety of vectors, bacterial and enzyme drain cleaners recently have been found containing salmonellae. The use of such contaminated products in sink drains in restaurants, food processing plants, institutions, and homes constitutes an obvious health hazard.

The complexities and our gaps in knowledge of the salmonella problem make it impossible to delineate in order of priority the measures and correction necessary for significant reduction of contamination in our food supply. Experience thus far indicates however that improved overall sanitation and observation of good manufacturing practices, control of air supply, microbiological testing of raw materials, plant environment, and in-line and finished products are essential for a control program.

Numerous reports and studies have shown that feed ingredients used to formulate complete feeds for livestock and poultry are frequently contaminated with salmonella, especially the animal by-product fraction such as meat scrap, fishmeal, and poultry meal. Since the salmonella infected animal provides the primary source of contamination of human foods, it appears that steps to reduce animal infection is one of the logical approaches toward reducing salmonellosis in man. FDA, in cooperation with USDA, the States, and the animal by-product industry, has an active program designed to materially reduce the occurrence of salmonellae in these basic feed ingredients.

We recognize that contaminated feeds constitute only one link in the chain of infection. Basic animal husbandry practices, feed-lot and brooder operations where we find a high concentration of animals in a confined area, and poultry dressing and packing house operations have contributory roles. And beyond the production phase, the contaminated environment in which food is processed compounds the problem.

In addition to the uncertainty of where salmonella may be encountered, there are a number of factors that present problems in enforcement activities. We are constantly confronted with a number of unanswered questions in reaching decisions and courses of action in our regulatory and control efforts. One of the most frequent questions arising is that of a tolerance level above zero. Limited clinical investigation on healthy adults, using four different serotypes indicated that dosages of 100,000 organisms and upwards were required to produce symptomatic infection. It was determined on the basis of most probable numbers that 15,000 _Salmonella cubana_ cells in the contaminated carmine red dye used as a marker in intestinal studies produced severe infections in hospital patients. It is a well accepted medical fact that infants, the elderly, and the debilitated are most susceptible to infection. How can safe "tolerances" be set for those groups? If we had assurance that 15,000 cells or some specific minimum were necessary to produce infection, then perhaps a tolerance for low numbers of organisms found in some of our foods and feeds would be acceptable. Unfortunately, we don't know the answer, and when we consider the highly susceptible infant, the individual seriously ill or weakened from some other cause, it does not appear that experimentation or trial feedings offer any practical solution to the problem. The only safe course is avoidance of any "tolerance" for salmonellae in our foods, especially if there is any likelihood of abuse or misuse of the food which would result in increased number of organisms.

Somewhat related to the question of infectious level is that of relative virulence and/or pathogenicity. To date some 145 salmonella serotypes have been isolated from human sources. More serotypes are being identified in human infections; hence, in the interest of public health, we must assume that any serotype is capable of producing disease.

Present-day methodology functions as a "built-in" tolerance, due to the inadequacy of detecting salmonellae in every instance. This weakness in the system is a deterrent to developing needed information on the frequency and extent of contamination in our food supply. The isolation and identification procedures are time consuming, thus limiting the number of individual tests that are practicable and feasible. In most foods, unless in a liquid state, salmonella contamination is not homogeneous. Usually the organism is present in low numbers; hence to recover them requires testing of multiple samples, sometimes of considerable size. Negative findings on a limited number of tests from a production lot of three, four, or ten thousand units provide little assurence that the lot is not in fact contaminated. If one looks at a probability table on random sampling, in terms of lots of 1,000 to 20,000 units, the limitations on today's laboratory capabilities become apparent. This means that in the majority of instances decision must be made on a lesser number of tests than would be desirable if the number of samples were not a factor. What is the significance of 1 positive finding out of 12 portions tested? No one can say with any degree of certainty. In such instances, we resample and increase our testing in an effort to determine how widespread the contamination may be. Even in those cases, we usually must settle for less than the number of tests necessary for a high confidence level. There are occasions when we find one of several individual tests positive and resampling fails to show additional positives. In the absence of evidence of unsanitary conditions or history of contamination of that firm's product, we notify the processor of our findings and recommend stepped up microbiological control. Such a situation calls for increased surveillance to determine if a plant may be seeded with salmonella and shedding the organism into production. However, we have not suggested recalls nor considered regulatory action on the basis of a single positive finding.

In practically each instance of recall of salmonella contaminated material, in some import detentions because of salmonella, or where a specific batch of product is withheld from the market because of suspected contamination, we are asked what reconditioning or reclaiming of the material for food use will be permitted. We have advised industry that reprocessing of the product in a manner to assure a positive kill is acceptable, accompanied by sufficient testing to establish that contamination was in fact destroyed. It is recognized that a significant proportion of some of our basic raw foods such as poultry, eggs and meat may be contaminated with salmonella. This is a situation that at the moment we must accept and deal with. However, it does not justify acceptance and use of contaminated processed ingredients.

Scrutiny of the salmonellosis problem reveals several areas where more scientific and technical knowledge is needed. What is the role of the human carrier in the total picture? We know outbreaks are traced to human carriers from time to time, but little has been developed on their contribution to the overall problem. The mechanism of animal-to-animal, man-to-animal, and animal-to-man transmission has not been clearly established and defined. Similarly, it is surprising how little data are available on survival of the organism in various steps of food processing, the opportunities for proliferation, and even the avenues or vectors of contamination or recontamination during the processing operations.

Industry, Government, and academic institutions are active in scientific studies to provide answers to these and other questions in order that better control measures can be applied by all concerned and to identify some of the points in the chain of infection and contamination that are more vulnerable to control pressures. But until such time as this additional knowledge is available, it is the responsibility of all concerned to institute and practice the most effective control procedures. The food and feed industries, the housewife and food handlers, the academic world, public health officials, all have a major role and area of responsibility. Only by each segment facing up to its responsibilities and diligently applying the best control measures known today, can we hope to make significant inroads in this serious public health problem.

B. Use of Secondhand Poultry Crates as Fresh Vegetable Containers

The following statement of general policy or interpretation was issued by James L. Goddard, M.D., Commissioner of Food and Drugs, and published in the Federal Register, Vol. 33, No. 71--Thursday, April 11, 1968:

"Because of the significance to the public health of avoiding Salmonella or other enteropathogenic micro-organisms in fresh vegetables, which are frequently consumed without cooking, the Commissioner of Food and Drugs calls attention to the applicability of the Federal Food, Drug, and Cosmetic Act to contamination in fresh vegetables and other edible products by issuing the following statement of policy. Accordingly, under the authority vested in the Secretary of Health, Education, and Welfare by said act (secs. 402(a), 701(a), 52 Stat. 1046, as amended, 1055; 21 U.S.C. 342(a), 371(a)) and delegated by him to the Commissioner (21 CFR 2.120), the following new section is added to Part 3:

§ 3.61 Use of secondhand poultry crates as fresh vegetable containers.

"(a) Investigations by the Food and Drug Administration, the National Communicable Disease Center of the U.S. Public Health Service, the Consumer and Marketing Service of the U.S. Department of Agriculture, and by various State public health agencies have revealed that Salmonella organisms are commonly present on dressed poultry and in excreta and fluid exudates from dressed birds.

"(b) It is widespread practice among some vegetable growers and packers to employ used poultry crates for shipment of fresh vegetables, including cabbage and celery.

"(c) Thus wooden crates in which dressed poultry has been iced and packed are potential sources of Salmonella or other enteropathogenic micro-organisms that may contaminate fresh vegetables, which are frequently consumed without heat treatment.

"(d) The Food and Drug Administration, therefore, will regard as adulterated within the meaning of section 402(a) of the Federal Food, Drug, and Cosmetic Act shipments of vegetables or other edible food in used crates or containers that may render the contents injurious to health..."

C. Announcement of Course on Methods for the Isolation of Salmonellae from Food Products and Animal Feeds

The Epidemiological Services Laboratory Section, Epidemiology Program, and the Bacteriology Section, Laboratory Program, at the National Communicable Disease Center will conduct a course on methods for isolating salmonellae from food products and animal feeds. The course will be conducted June 3-14, 1968*, and January 6-17, 1969**. The prerequisite for the course is 6 months' experience in either a bacteriology or quality control laboratory. State, federal, and industry personnel may apply. Application forms can be obtained through:

Training Office
Laboratory Consultation and Development Section
Laboratory Program
National Communicable Disease Center
Atlanta, Georgia 30333

*Three openings still available.
**Registration ends November 11, 1968.

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, MARCH 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								1																			1	4
bareilly											1			2				1	1								2					
blockley				1							3			5	4				3				1		1		1		1		1	
braenderup				2				1			5												4									
bredeney											17																					
chester									1						6																	
cholerae-suis v kun																									1				2		1	
cubana				2								3	1	2											1							1
derby			1				1	1	1		3			3											1							
enteritidis				3		2		1	7	2	4	6	1	12	3	3	2	1	1				1			3	3		4		9	
give											1																				1	
heidelberg				1				1	12	2	7	1	1	2	2	1			2						1	2	5		1		6	4
indiana																																
infantis				3				1	1	2	2	2	1	4	1	1	1		3						1	2			1		3	1
java									3		6			1		6	1		1				1									2
javiana																																2
litchfield														1																	1	
livingstone																																
manhattan								1	1	2					2										1		1		1		1	1
miami																															2	
mississippi																																
montevideo				2		1			1			2		1																		1
muenchen				1											1								2		1		2					
newington																															1	
newport				2	1	2		1				3		2	1		1							1							1	4
oranienburg									1	1					2	6			1													1
panama									2		2			1																		
paratyphi B				4								2	1		1										1							
reading																																
saint-paul				4				2	6	4	2	1		2	18				1					1	4	1					2	3
san-diego				2																			2			1						
schwarzengrund														1																	1	
senftenberg				1							1																				1	
tennessee												1		2																		1
thompson	1			1				2	4	3	1	1		3		2	1							1	1		2	1			2	
typhi				5			2		1	1	3					1	1							1	4		1				4	4
typhimurium				10	1	1		21	10	10	11	5	2	13	8	8	5	2	8		1		11		5	1	3		2		10	7
typhimurium v cop				2		1				2					10																	
weltevreden																																
worthington																																
TOTAL	1	–	1	47	2	7	3	32	51	29	69	28	7	57	59	28	12	4	21	–	1	–	22	4	23	10	20	1	12	–	48	36
ALL OTHER*	–	3	–	2	3	1	24	3	2	1	3	–	–	4	3	5	–	3	–	–	–	–	–	–	1	17	–	–	1	–	3	[illegible]
TOTAL	1	3	1	49	5	8	27	35	53	30	72	28	7	61	62	33	12	7	21	–	1	–	22	4	24	27	20	1	13	–	51	39

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 79 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				1									1				1		1	12	1.1	47	1.3	*anatum*
																					7	0.6	17	0.5	*bareilly*
					2		1								1		1	5			31	2.8	93	2.6	*blockley*
					1		2											1		1	17	1.6	38	1.1	*braenderup*
																				1	18	1.7	38	1.1	*bredeney*
																					7	0.6	11	0.3	*chester*
																		1			5	0.5	10	0.3	*cholerae-suis v kun*
	1																				11	1.0	18	0.5	*cubana*
					1		2											2		2	18	1.7	107	3.0	*derby*
1					2		4				1			1				1		1	79	7.3	231	6.4	*enteritidis*
																				1	3	0.3	12	0.3	*give*
1					3		7							3		1		8		1	75	6.9	256	7.1	*heidelberg*
																					—	—	7	0.2	*indiana*
2					3		1		1		3		1					5		2	48	4.4	203	5.6	*infantis*
		1																2			24	2.2	56	1.6	*java*
						1															3	0.3	38	1.1	*javiana*
	1																	1			4	0.4	14	0.4	*litchfield*
						1														2	3	0.3	10	0.3	*livingstone*
1					2													2		1	17	1.6	39	1.1	*manhattan*
																					2	0.2	19	0.5	*miami*
							1														1	0.1	4	0.1	*mississippi*
					3													1			12	1.1	42	1.2	*montevideo*
							2						1								10	0.9	35	1.0	*muenchen*
																					1	0.1	9	0.2	*newington*
				1	10		5						1					8		3	47	4.3	189	5.2	*newport*
							1								1			1			15	1.4	69	1.9	*oranienburg*
							2													4	11	1.0	50	1.4	*panama*
											2										11	1.0	29	0.8	*paratyphi B*
																1					1	0.1	8	0.2	*reading*
													1					1		4	57	5.2	246	6.8	*saint-paul*
													1					4			10	0.9	30	0.8	*san-diego*
																					2	0.2	8	0.2	*schwarzengrund*
																					3	0.3	5	0.1	*senftenberg*
																		1			5	0.5	14	0.4	*tennessee*
																		2			28	2.6	91	2.5	*thompson*
1				1	8		3			1	1	5	1		1		1	3			54	5.0	131	3.6	*typhi*
1	3				4	4	22	1	1					3		11	1	55		4	265	24.4	926	25.6	*typhimurium*
									2						2		3				22	2.0	61	1.7	*typhimurium v cop*
																				1	1	0.1	13	0.4	*weltevreden*
																				1	1	0.1	7	0.2	*worthington*
7	6	1	—	2	40	6	53	1	4	1	7	5	6	8	5	13	6	105	—	30	941	86.5	3231	89.5	TOTAL
1	—	—	3	1	6	—	13	—	—	1	—	26	1	—	—	4	2	4	—	3	147		380		ALL OTHER*
8	6	1	3	3	46	6	66	1	4	2	7	31	7	8	5	17	8	109	—	33	1088		3611		TOTAL

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

SEROTYPE	REPORTING CENTER																			
	ARI	ARK	CAL	CON	DC	FLA	GA	HAW	ILL	IOW	KY	LA	MD	MAS	MIC	MIS	NH	NJ	NM	NYA
alachua			1																	
albany				1								1								
berlin																				
bern							1													
berta						1														
binza								1												
cerro								1												
cholerae-suis	1				1															
drypool												2								
dublin			1												1					
eimsbuettel												1								
gaminara			1																	
habana																				
kentucky										1										
kintambo																				
lomita																				
minnesota												2								
muenster						1	1		1											
nchanga									2											
oslo								1												
paratyphi A			1																	
poona											1				1					
siegburg																		1		
simsbury														1						
urbana															1					
wassenaar									1											
westhampton																				
TOTAL	1	–	4	1	1	2	2	3	4	1	1	6	–	1	3	–	–	1	–	–
NOT TYPED*	–	1	–	–	16	1	1	–	–	2	–	–	1	1	–	3	3	–	26	24
TOTAL	**1**	**1**	**4**	**1**	**17**	**3**	**3**	**3**	**4**	**3**	**1**	**6**	**1**	**2**	**3**	**3**	**3**	**1**	**26**	**24**

* See Table V-A

TABLE II – Continued

REPORTING CENTER														TOTAL	CUMULATIVE TOTAL	SEROTYPE
	NYB	NYC	NC	ORE	PA		RI	TEX	WAS	WIS	WYO					
									1					2	3	*alachua*
														2	6	*albany*
					2									2	2	*berlin*
														1	1	*bern*
														1	6	*berta*
														1	2	*binza*
														1	1	*cerro*
	3													5	7	*cholerae-suis*
														2	3	*drypool*
								1						3	6	*dublin*
														1	1	*eimsbuettel*
														1	4	*gaminara*
									1					1	4	*habana*
		1						1						3	5	*kentucky*
									1					1	1	*kintambo*
								3						3	3	*lomita*
														2	5	*minnesota*
														3	9	*muenster*
														2	2	*nchanga*
				1										2	2	*oslo*
														1	4	*paratyphi A*
			1											3	5	*poona*
														1	2	*siegburg*
														1	1	*simsbury*
					1									2	5	*urbana*
														1	1	*wassenaar*
									1					1	1	*westhampton*
	3	1	1	1	3		–	5	4	–	–			49	124	TOTAL
	–	1	–	1	–		3	8	–	5	1			98	256	NOT TYPED*
	3	**2**	**1**	**2**	**3**		**3**	**13**	**4**	**5**	**1**			**147**	**380**	**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, MARCH 1968

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
anatum	1	2	1			1	5	15		3	18
bareilly							—				—
blockley	6				1		7				—
braenderup							—				—
bredeney	2	3	1				6	2		2	4
chester		4					4				—
cholerae-suis v kun	1	1	8	1			11				—
cubana							—	12		1	13
derby		1		1			2	11		2	13
enteritidis	8	1					9	1			1
give	3	1					4				—
heidelberg	32	9					41			4	4
indiana	2						2				—
infantis	5	1					6	2		4	6
java							—				—
javiana							—				—
litchfield							—				—
livingstone	1						1	7			7
manhattan	1						1				—
miami							—				—
mississippi							—				—
montevideo	7	1					8	15		4	19
muenchen							—			1	1
newington			1				1	1			1
newport	1	3		2			6	1			1
oranienburg			1				1	5		1	6
panama			2				2				—
paratyphi B							—				—
reading							—				—
saint-paul	11	11				1	23			1	1
san-diego		2					2				—
schwarzengrund							—				—
senftenberg	2	4					6	1		2	3
tennessee	1						1	3		1	4
thompson	9	2	1				12			1	1
typhi							—				—
typhimurium	17	10	3	21	5	1	57			3	3
typhimurium v cop	9			6	1		16	2		1	3
weltevreden							—				—
worthington		2					2	4			4
TOTAL	119	58	18	31	7	3	236	82	—	31	113
ALL OTHER*	5	5	4	2	—	3	19	33	—	14	47
TOTAL	124	63	22	33	7	6	255	115	—	45	160

* See Table IV

TABLE III – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRONMENT	HUMAN DIETARY ITEMS: EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL	MISCELLANEOUS	TOTAL	CUMULATIVE TOTAL	SEROTYPE
				11			11		34	184	*anatum*
							–		–	8	*bareilly*
							–	1	8	40	*blockley*
							–		–	4	*braenderup*
							–		10	26	*bredeney*
							–		4	19	*chester*
							–		11	35	*cholerae-suis v kun*
				2	1		3	4	20	98	*cubana*
	1						–		16	46	*derby*
							–	1	11	51	*enteritidis*
							–		4	9	*give*
1				1			1	1	48	201	*heidelberg*
							–		2	3	*indiana*
1			4				4	3	20	65	*infantis*
							–		–	5	*java*
							–		–	4	*javiana*
							–		–	1	*litchfield*
							–		8	36	*livingstone*
							–		1	1	*manhattan*
							–		–	5	*miami*
							–		–	–	*mississippi*
			2	2	1		5	2	34	118	*montevideo*
							–		1	13	*muenchen*
							–		2	19	*newington*
	1						–		8	46	*newport*
2		1		1			2	2	13	49	*oranienburg*
							–		2	5	*panama*
							–		–	1	*paratyphi B*
							–	1	1	11	*reading*
1							–	2	27	105	*saint-paul*
				1			1		3	9	*san-diego*
2							–		2	18	*schwarzengrund*
1							–	2	12	53	*senftenberg*
				1			1		6	44	*tennessee*
							–	1	14	57	*thompson*
							–		–	–	*typhi*
4	2		4	1			5	2	73	233	*typhimurium*
1							–	3	23	60	*typhimurium v cop*
1							–		1	1	*weltevreden*
							–		6	26	*worthington*
14	4	1	10	20	2	–	33	25	425	1709	TOTAL
13	2	–	–	6	2	–	8	5	94	425	ALL OTHER*
27	6	1	10	26	4	–	41	30	519	2134	TOTAL

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

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
alachua							—	1			1
amsterdam							—			2	2
binza		1	2				3	2		1	3
bornum							—	1			1
california	2						2			1	1
cerro							—	4			4
cholerae-suis			1				1				—
drypool							—			2	2
dublin				1			1				—
eimsbuettel	1						1	10		6	16
fresno							—	1			1
gallinarum		1					1				—
grumpensis							—	1			1
horsham							—				—
johannesburg						3	3				—
lexington							—	1			1
manila							—	1		1	2
marina							—				—
meleagridis							—	1			1
minnesota		2					2				—
muenster							—	1			1
pomona							—				—
pullorum	1						1				—
rubislaw				1			1				—
siegburg							—	1		1	2
simsbury							—				—
thomasville		1					1	4			4
typhi-suis			1				1				—
urbana							—	1			1
TOTAL	4	5	4	2	—	3	18	30	—	14	44
NOT TYPED*	1	—	—	—	—	—	1	3	—	—	3
TOTAL	**5**	**5**	**4**	**2**	**—**	**3**	**19**	**33**	**—**	**14**	**47**

* See Table V-B

TABLE IV – Continued

WILD ANIMALS AND BIRDS	REPTILES AND ENVIRON-MENT	HUMAN DIETARY ITEMS: EGGS AND PRODUCTS	POULTRY	RED MEAT	DAIRY PRODUCTS	OTHER	SUBTOTAL	MISCEL-LA-NEOUS	TOTAL	CUMU-LATIVE TOTAL	SEROTYPE
							–		1	9	*alachua*
							–		2	10	*amsterdam*
1				2			2		9	26	*binza*
							–		1	1	*bornum*
							–	2	5	30	*california*
				2			2		6	36	*cerro*
							–		1	2	*cholerae-suis*
							–		2	9	*drypool*
							–		1	6	*dublin*
							–		17	55	*eimsbuettel*
							–		1	1	*fresno*
							–		1	2	*gallinarum*
							–		1	9	*grumpensis*
1							–		1	1	*horsham*
							–		3	6	*johannesburg*
							–	1	2	9	*lexington*
							–		2	5	*manila*
	2						–		2	2	*marina*
							–		1	10	*meleagridis*
					2		2		4	11	*minnesota*
				1			1		2	3	*muenster*
3							–		3	3	*pomona*
3							–		4	11	*pullorum*
3							–	1	5	6	*rubislaw*
							–		2	16	*siegburg*
							–	1	1	5	*simsbury*
							–		5	21	*thomasville*
							–		1	3	*typhi-suis*
1				1			1		3	6	*urbana*
12	2	–	–	6	2	–	8	5	89	409	TOTAL
1	–	–	–	–	–	–	–	–	5	16	NOT TYPED*
13	2	–	–	6	2	–	8	5	94	425	TOTAL

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

A. HUMAN SOURCES

REPORTING CENTER	GROUP B	C	C_1	C_2	D	E	G	H	UNK	TOTAL
ARKANSAS			1							1
D.C.	6	2	4	1	1				2	16
FLORIDA						1				1
GEORGIA	1									1
IOWA	2									2
MARYLAND	1									1
MASSACHUSETTS	1									1
MISSISSIPPI	3									3
NEW HAMPSHIRE	3									3
NEW MEXICO	24						2			26
NEW YORK – A									24	24
NEW YORK – C									1	1
OREGON									1	1
RHODE ISLAND	2		1							3
TEXAS	1				1				6	8
WISCONSIN									5	5
WYOMING									1	1
TOTAL	44	2	6	1	2	1	2	–	40	98

B. NONHUMAN SOURCES

SOURCES	GROUP B	C	C_1	C_2	D	E	G	H	UNK	TOTAL
DOMESTIC ANIMALS AND THEIR ENVIRONMENT									1	1
ANIMAL FEEDS			2					1		3
WILD ANIMALS AND BIRDS				1						1
REPTILES AND ENVIRONMENT										–
HUMAN DIETARY ITEMS										–
MISCELLANEOUS										–
TOTAL	–	–	2	1	–	–	–	1	1	5

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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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