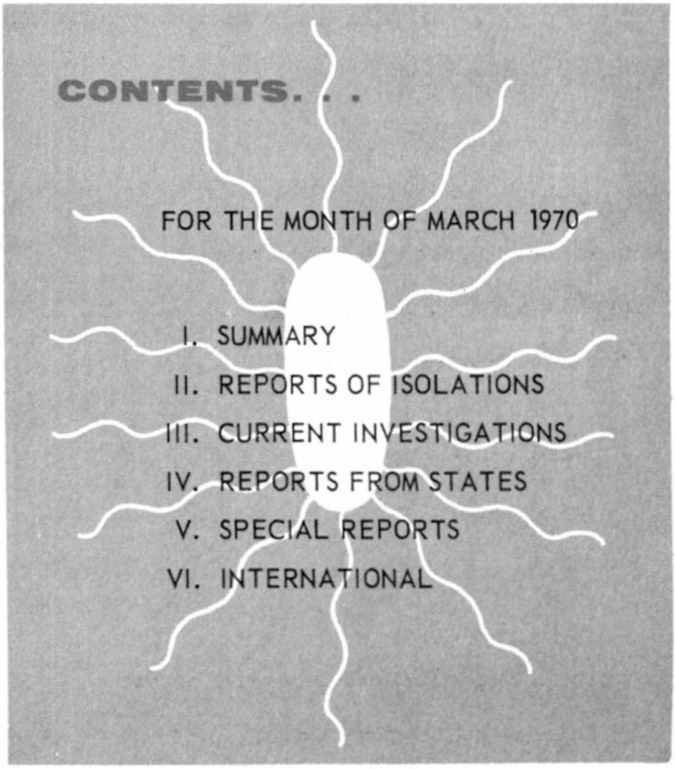
REPORT NO. 96
May 12, 1970

NATIONAL
COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE



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 March 1970, 1,333 isolations of salmonellae were reported from humans, an average of 334 isolations per week (Tables I, II, and V-A). This number represents an increase of 7 (2.1 percent) over the weekly average of February 1970 and an increase of 43 (14.8 percent) over the weekly average of March 1969.

Reports of 1,009 nonhuman isolations of salmonellae were received during March 1970 (Tables II, 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*	302	22.7	1	heidelberg	131	13.0
2	heidelberg	162	12.2	3	typhi-murium*	101	10.0
3	infantis	107	8.0	7	thompson	98	9.7
4	enteritidis	81	6.1	2	anatum	59	5.8
5	newport	71	5.3	4	saint-paul	45	4.5
6	blockley	67	5.0	10	senftenberg	45	4.5
7	saint-paul	49	3.7	6	infantis	37	3.7
8	thompson	41	3.1	5	blockley	31	3.1
9	typhi	33	2.5	9	oranienburg	29	2.9
10	oranienburg	29	2.2	>10	cholerae-suis var. kunzendorf	28	2.8
	Total	942	70.7		Total	604	59.9
	TOTAL (all serotypes)	1,333			TOTAL (all serotypes)	1,009	
	*Includes var. copenhagen	14	1.1		*Includes var. copenhagen	23	2.3

The increase in S. heidelberg isolations reported this month is due to a large outbreak in Pennsylvania from which approximately 80 isolations were obtained.

III. CURRENT INVESTIGATIONS

None

IV. REPORTS FROM THE STATES

Reports of Salmonella Outbreaks received During the Months of February and March

State	Month Of Outbreak	Location	Serotype	Number of Persons: Ill	At Risk	With Positive Cultures	Hospitalized	Deaths	Vehicle	Comment
February										
New Mexico	November 1969	Banquets (Mental Hospital)	S. newport	12	35	11	-	0	Turkey	
March										
Oregon	February 1970	Restaurant	S. san diego	5	?	3	0	0	?	
Michigan	March 1970	Nursing Home	S. typhi-murium	65	290	38	-	5	? Person-to-person	*

*Reported in MMWR, Vol. 19, No. 15 and SSR No. 96

V. SPECIAL REPORTS

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

The Epidemiology Program and the Laboratory Division of the National Communicable Disease Center will conduct a course on methods for isolating salmonellae from food products and animal feeds on June 15-26, 1970. The prerequisite for the course is 6 months' experience in either a bacteriology or quality control laboratory. The course is divided equally between lectures and laboratory exercises. Lectures include epidemiology, sampling, and principles of isolation and identification. Laboratory exercises include all necessary steps in the isolation and the preliminary biochemical and serologic identification of salmonellae from various foods and feeds, such as eggs, dry milk, candy, red meats, poultry, animal by-products, and fish meal.

State, Federal, and industry personnel may obtain application forms through:

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

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

B. Announcement of a Course on Epidemiology and Control of Salmonellosis

The Continuing Education and Field Service, School of Public Health, University of North Carolina, and the National Communicable Disease Center will present a course, "Epidemiology and Control of Salmonellosis," at the University of North Carolina, Chapel Hill, North Carolina, June 29 - July 3, 1970. This five-day course has been designed for supervisors of food hygiene programs, veterinarians, sanitarians, and other members of public health and agricultural agencies and industry who deal with the epidemiology and control of salmonellosis. Control of salmonellosis will be emphasized. Current information and immediately useful techniques related to control will be delineated. Laboratory isolation procedures are only briefly covered in the course.

Following an overview of the morbidity and mortality attributed to salmonellosis, the bacteriology of the Salmonella organism and environmental factors that govern its survival or destruction are presented. Selected phenomena of the epidemiology of salmonellosis including the reservoirs of salmonellae are discussed. Close attention is given to the contributory sources of salmonella contamination of food, water, animal feed, and fertilizer, and of animals themselves. The course emphasizes techniques of control, particularly as applied in the farm environment, in the processing of foods and of animal feed, and in food-service operations. Administrative application of the information, techniques, and concepts are considered, and program activities of various interested agencies are reviewed. Lectures, demonstrations, problem workshops, discussions, field work, and laboratory exercises are used to teach the course.

For further information, contact: Continuing Education and Field Service, School of Public Health, University of North Carolina, Chapel Hill, North Carolina 27514, or Frank L. Bryan, Ph.D., Chief, Foodborne Disease Activity, Health Agencies Branch, Training Program, NCDC, Atlanta, Georgia 30333.

VI. INTERNATIONAL

None

TABLE I. COMMON SALMONELLAE REPORTED FROM HUMAN SOURCES, MARCH, 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	OHI	IND	ILL	MIC	WIS	MIN	IOW	MO	ND	SD	NEB	KAN	DEL	MD	DC	VA	WVA	NC	SC	GA	FLA
anatum				2							1				1	1					1									1	4
bareilly																															1
blockley				6				1	6		1	1		6	3			2	1						24					2	1
braenderup				1																											
bredeney				1					2					9											4						2
chester				1							1					1															1
cholerae-suis v kun														1																1	
cubana				1							1				1													1		1	4
derby								1		2		1		3											3		1			1	
enteritidis	3			3		1	1	10	9	1	9	8	1	10	2		1		2								2			2	4
give																															
heidelberg				3				5	8	7	86	3	1	6	4	1	5		2						1	1				2	7
indiana									1			3		1																2	2
infantis	3		1	5	1	5		1	4	1	3	4	8		6		1	1	2		1				2	1				4	4
java	1					1		1	1	1	3			1		1	1													1	8
javiana																															2
litchfield									1					2					2											1	7
livingstone																															
manhattan				1		1				1	1	2		1	1	5				1					1					1	2
miami																															1
mississippi																															
montevideo				3					1	2	1	1		1		2			1						1		2			2	
muenchen						1			1	1		2		2																2	7
newington																															
newport				2		2			2	2	1	1	4	1		7			1				1		2						6
oranienburg				1						7		5				1			1								2			1	3
panama										1	2																				
paratyphi B				1				1				5			1																1
reading																															1
saint-paul				1		2		4	1	1	10	1	1	5	2	4	1		1						2						4
san-diego									1					1			1												1		1
schwarzengrund												1					1													1	
senftenberg								1																							1
tennessee									1	3				1																	1
thompson			1	2		1		1		3		3		2	3	3	2		2								1			2	4
typhi								1	3		1		2	2			1		1												7
typhimurium	1			7		6		6	13	6	16	5	3	16	28	7	6	1	4		5		2		11	1	2		2		8	16
typhimurium v cop	1			5		1				2				1	2					1											
weltevreden																															
worthington				2																										1	1
TOTAL	9	–	2	48	1	21	1	33	55	41	137	46	20	72	54	33	20	4	20	2	7	–	3	–	51	3	10	–	4	–	36	103
ALL OTHER*	1	2	–	1	2	1	7	3	6	1	13	1	–	1	4	–	–	3	2	–	–	1	3	–	5	7	–	–	2	–	–	14
TOTAL	10	2	2	49	3	22	8	36	61	42	150	47	20	73	58	33	20	7	22	2	7	1	6	–	56	10	10	–	6	–	36	117

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 72 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	14	1.1	41	1.0	*anatum*
							1														2	0.2	10	0.2	*bareilly*
1	2				1		5			1	1							2			67	5.0	126	3.0	*blockley*
																					1	0.1	6	0.1	*braenderup*
							1									1		1			21	1.6	41	1.0	*bredeney*
																					4	0.3	15	0.4	*chester*
																					2	0.2	4	0.1	*cholerae-suis v kun*
1											2			1							13	1.0	47	1.1	*cubana*
	2				1		1									1		6		4	27	2.0	101	2.4	*derby*
1	2	2						1										3		3	81	6.1	309	7.4	*enteritidis*
																				1	1	0.1	6	0.1	*give*
	1				4	1	5						3	1			1	4			162	12.2	386	9.2	*heidelberg*
		4																			13	1.0	21	0.5	*indiana*
	3	1					4				1					2	3	34		1	107	8.0	228	5.4	*infantis*
																		3		1	24	1.8	72	1.7	*java*
							1							1							4	0.3	27	0.6	*javiana*
	2																				15	1.1	43	1.0	*litchfield*
																					–	–	4	0.1	*livingstone*
	1					5												3		1	28	2.1	92	2.2	*manhattan*
																					1	0.1	6	0.1	*miami*
																					–	–	2	0.0	*mississippi*
																		1			18	1.4	58	1.4	*montevideo*
																		1			17	1.3	42	1.0	*muenchen*
																		1			1	0.1	4	0.1	*newington*
	1				3		4				2		9	1			2	13		4	71	5.3	277	6.6	*newport*
		3			1		1						1					2			29	2.2	71	1.7	*oranienburg*
																1		1		2	7	0.5	27	0.6	*panama*
																3					12	0.9	31	0.7	*paratyphi B*
1																		1			3	0.2	20	0.5	*reading*
					2											2		4	1		49	3.7	175	4.2	*saint-paul*
															1	1		6			13	1.0	128	3.1	*san-diego*
																					3	0.2	18	0.4	*schwarzengrund*
					1																3	0.2	13	0.3	*senftenberg*
1																					7	0.5	11	0.3	*tennessee*
	1				3											3		4			41	3.1	166	4.0	*thompson*
				3	2		3	1				1	1					4			33	2.5	101	2.4	*typhi*
	7	8		3	4	2	11				6			1		10	2	58		4	288	21.6	978	23.4	*typhimurium*
	1																				14	1.1	53	1.3	*typhimurium v cop*
																		1		5	6	0.5	21	0.5	*weltevreden*
																		2		2	8	0.6	17	0.4	*worthington*
5	23	18	–	6	22	8	37	2	–	1	12	1	15	5	1	25	8	155	1	29	1210	90.8	3798	90.8	TOTAL
–	2	–	2	2	–	1	7	1	–	–	–	6	1	–	–	–	6	7	7	1	123		386		ALL OTHER*
5	**25**	**18**	**2**	**8**	**22**	**9**	**44**	**3**	**–**	**1**	**12**	**7**	**16**	**5**	**1**	**25**	**14**	**162**	**8**	**30**	**1333**		**4184**		**TOTAL**

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

SEROTYPE	REPORTING CENTER																					
	ALK	ARI	ARK	CAL	CONT	DC	FLA	HAW	ILL	IOW	KAN	ME	MD	MAS	MIC	MIS	MO	MON	NEB	NH	NJ	NM	NYA
abony																							
alachua							2																
albany				3																			
amager							1																
berta				1			1								1								
bradford																							
caracas																							
cerro															1								
chailey																							
concord											1												
dublin				1																			
duesseldorf							2																
gaminara		1																					
hartford							1																
irumu																	2						
kentucky																							
london																							
minnesota													5										
muenster							2																
new-brunswick																							
norwich																							
ohio									1												1		
ordonez																							
orion										1													
oslo								1				1											
poona				2	1		1				2												
richmond							1																
simsbury																							
thomasville																							
uganda							1																
uppsala																							
urbana							1								2			1					1
TOTAL	–	1	–	7	1	–	13	1	1	1	3	1	5	–	4	–	2	1	–	–	1	–	1
NOT TYPED*	7	–	2	–	–	7	1	–	–	2	–	–	–	1	–	2	–	–	1	2	–	6	6
TOTAL	7	1	2	7	1	7	14	1	1	3	3	1	5	1	4	2	2	1	1	2	1	6	7

* See Table V-A

TABLE II – Continued

REPORTING CENTER														TOTAL	CUMULATIVE TOTAL	SEROTYPE
NYB	NYC	NC	OHI	OKL	ORE	PA	RI	TEN	TEX							
						1								1	1	*abony*
														2	4	*alachua*
														3	6	*albany*
								1						2	4	*amager*
1														4	14	*berta*
						1								1	2	*bradford*
	1													1	1	*caracas*
														1	4	*cerro*
	1													1	3	*chailey*
														1	1	*concord*
														1	1	*dublin*
														2	8	*duesseldorf*
														1	2	*gaminara*
														1	2	*hartford*
														2	2	*irumu*
									1					1	9	*kentucky*
		1												1	1	*london*
														5	14	*minnesota*
														2	4	*muenster*
						1								1	5	*new-brunswick*
				1										1	1	*norwich*
														2	3	*ohio*
						9								9	9	*ordonez*
														1	1	*orion*
														2	5	*oslo*
			1											7	22	*poona*
														1	2	*richmond*
1														1	2	*simsbury*
									1					1	1	*thomasville*
														1	1	*uganda*
						1								1	1	*uppsala*
														5	9	*urbana*
2	2	1	1	1	–	13	–	1	2					66	177	TOTAL
1	4	1	–	–	6	–	2	1	5					57	209	NOT TYPED *
3	**6**	**2**	**1**	**1**	**6**	**13**	**2**	**2**	**7**					**123**	**386**	**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, 1970

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
anatum	4	8	2	1			15	28		1	29
bareilly		1	1				2	3			3
blockley	26					2	28				—
braenderup							—				—
bredeney		2		1			3	8		2	10
chester							—				—
cholerae-suis v kun			28				28				—
cubana							—	2		1	3
derby	1	8	4				13	5			5
enteritidis	13	1	1				15				—
give		1					1				—
heidelberg	26	80	12	6			124	1		3	4
indiana	1		2				3	7			7
infantis	10	7					17	5	1	1	7
java							—				—
javiana							—				—
litchfield							—				—
livingstone		1				1	2	6			6
manhattan	1						1				—
miami							—				—
mississippi							—				—
montevideo	9					1	10	7			7
muenchen				1			1				—
newington	1						1	1			1
newport	5	1	1	1			8				—
oranienburg	1						1	20			20
panama		1					1				—
paratyphi B							—				—
reading	1	2					3				—
saint-paul	13	31				1	45				—
san-diego	1	22					23				—
schwarzengrund	1	4	1				6	3			3
senftenberg	3	14					17	20		5	25
tennessee		4	1	1			6	15			15
thompson	71	1	1			2	75				—
typhi							—				—
typhimurium	5	13	5	20		25	68				—
typhimurium v cop	10	1	2	5	1	2	21				—
weltevreden							—				—
worthington	9	2				1	12	5		3	8
TOTAL	212	205	61	36	1	35	550	136	1	16	153
ALL OTHER*	30	12	8	13	1	12	76	47	1	18	66
TOTAL	**242**	**217**	**69**	**49**	**2**	**47**	**626**	**183**	**2**	**34**	**219**

* 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				
2						2	2	11	59	186	*anatum*
						4	4		9	14	*bareilly*
		3					3		31	45	*blockley*
		2		1		1	4		4	8	*braenderup*
1							–	1	15	52	*bredeney*
							–		–	10	*chester*
							–		28	119	*cholerae-suis v kun*
							–		3	14	*cubana*
				2			2		20	33	*derby*
							–		15	42	*enteritidis*
						2	2		3	3	*give*
			1				1	2	131	241	*heidelberg*
							–		10	13	*indiana*
		2		6		1	9	4	37	79	*infantis*
	1						–		1	14	*java*
							–		–	3	*javiana*
							–		–	2	*litchfield*
							–		8	18	*livingstone*
							–		1	9	*manhattan*
6							–		6	6	*miami*
							–		–	–	*mississippi*
		3			1	1	5	2	24	60	*montevideo*
							–		1	4	*muenchen*
							–		2	8	*newington*
1	2				4	2	6	2	19	58	*newport*
1		2		3		2	7		29	59	*oranienburg*
							–		1	1	*panama*
1							–		1	2	*paratyphi B*
							–		3	17	*reading*
							–		45	171	*saint-paul*
							–		23	68	*san-diego*
						2	2		11	21	*schwarzengrund*
				2			2	1	45	91	*senftenberg*
		1				1	2		23	52	*tennessee*
2	4	10	1				11	6	98	141	*thompson*
							–		–	–	*typhi*
8							–	2	78	257	*typhimurium*
							–	2	23	44	*typhimurium v cop*
							–		–	–	*weltevreden*
							–		20	59	*worthington*
22	7	23	2	14	5	18	62	33	827	2024	TOTAL
3	13	8	–	1	8	3	20	4	182	501	ALL OTHER*
25	**20**	**31**	**2**	**15**	**13**	**21**	**82**	**37**	**1009**	**2525**	**TOTAL**

TABLE IV. OTHER SALMONELLAE REPORTED FROM NONHUMAN SOURCES, MARCH, 1970

SEROTYPE	DOMESTIC ANIMALS AND THEIR ENVIRONMENT							ANIMAL FEEDS			
	CHICKENS	TURKEYS	SWINE	CATTLE	HORSES	OTHER	SUBTOTAL	TANKAGE	VEGETABLE PROTEIN	OTHER	SUBTOTAL
albany				1			1				—
bern							—				—
berta				2			2				—
binza							—	2			2
bornum							—	2		3	5
california	2						2	1			1
cerro							—	3		1	4
cholerae-suis			1				1				—
corvallis							—				—
drypool		2		1			3				—
dublin				5			5				—
eimsbuettel	3	1	3			2	9	8		5	13
gallinarum	1						1				—
heilbron							—				—
hillbrow		1					1				—
johanneaburg							—				—
kentucky		1				2	3	4			4
kottbus	1						1				—
lexington							—	2			2
madelia							—			3	3
marina							—				—
matadi							—				—
meleagridis							—			1	1
minnesota		1				3	4	11			11
muenster	2		2				4	1			1
orion						1	1				—
pomona							—	2			2
pullorum	10	1				2	13				—
saphra							—				—
siegburg	2	1	1	1			5	2			2
simsbury		1					1	1	1		2
taksony						1	1	6		1	7
thomasville				1			1	2		2	4
typhi-suis			1				1				—
urbana							—				—
wassenaar							—				—
TOTAL	21	9	8	11	—	11	60	47	1	16	64
NOT TYPED*	9	3	—	2	1	1	16	—	—	2	2
TOTAL	**30**	**12**	**8**	**13**	**1**	**12**	**76**	**47**	**1**	**18**	**66**

*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	8	*albany*
2							–		2	2	*bern*
							–		2	6	*berta*
							–		2	9	*binza*
	1						–		6	8	*bornum*
							–	1	4	12	*california*
							–		4	15	*cerro*
							–		1	4	*cholerae-suis*
		1					1		1	1	*corvallis*
							–		3	16	*drypool*
							–		5	20	*dublin*
							–	1	23	69	*eimsbuettel*
							–		1	3	*gallinarum*
		3					3		3	3	*heilbron*
							–		1	1	*hillbrow*
	2					2	2		4	6	*johannesburg*
							–		7	44	*kentucky*
							–		1	1	*kottbus*
							–		2	4	*lexington*
							–		3	4	*madelia*
	4						–		4	10	*marina*
	1						–		1	1	*matadi*
					8		8		9	10	*meleagridis*
							–		15	42	*minnesota*
							–		5	10	*muenster*
							–		1	11	*orion*
							–		2	2	*pomona*
							–	2	15	26	*pullorum*
						1	1		1	1	*saphra*
		3					3		10	29	*siegburg*
							–		3	8	*simsbury*
							–		8	16	*taksony*
							–		5	14	*thomasville*
							–		1	3	*typhi-suis*
	1						–		1	15	*urbana*
	3						–		3	4	*wassenaar*
2	12	8	–	–	8	3	19	4	161	459	TOTAL
1	1	–	–	1	–	–	1	–	21	42	NOT TYPED*
3	13	8	–	1	8	3	20	4	182	501	TOTAL

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

A. HUMAN SOURCES

REPORTING CENTER	GROUP														TOTAL
		A	B	C			C1	C2	D			M	O	UNK	
ALASKA			1				1	5							7
ARKANSAS							2								2
DISTRICT OF COLUMBIA			5	1					1						7
FLORIDA								1							1
IOWA			2												2
MASSACHUSETTS			1												1
MISSISSIPPI				1										1	2
NEBRASKA														1	1
NEW HAMPSHIRE			2												2
NEW MEXICO			1				2	1	2						6
NEW YORK – A														6	6
NEW YORK –B1									1						1
NEW YORK – C			1	2					1						4
NORTH CAROLINA							1								1
OREGON			1	3					1					1	6
RHODE ISLAND		1	1												2
TENNESSEE			1												1
TEXAS			1				2						1	1	5
TOTAL		1	17	7			8	7	6				1	10	57

B. NONHUMAN SOURCES

SOURCES	GROUP														TOTAL
		A	B	C			C1	C2	D			M	O	UNK	
DOMESTIC ANIMALS AND THEIR ENVIRONMENT			4				1							11	16
ANIMAL FEEDS												1		1	2
WILD ANIMALS AND BIRDS														1	1
REPTILES AND ENVIRONMENT														1	1
HUMAN DIETARY ITEMS							1								1
MISCELLANEOUS															–
TOTAL		–	4	–			2	–	–			1	–	14	21

STATE EPIDEMIOLOGISTS AND STATE LABORATORY DIRECTORS

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

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