REPORT NO. 54
NOVEMBER 14, 1966

COMMUNICABLE DISEASE CENTER

SALMONELLA

SURVEILLANCE

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For the month of September 1966

U. S. Department of Health, Education, and Welfare / Public Health Service

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 to:

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I. SUMMARY

In September, 1,824 isolations of salmonellae from humans were reported, an average of 456 isolations per week. This number represents a decrease of 26 (5.4 percent) from the weekly average of August 1966 and a decrease of 48 (9.5 percent) from the weekly average of September 1965. The cumulative number of isolations reported for the first 9 months of 1966 was 14,739, a decrease of 5.4 percent from the 15,585 isolations reported during this same period in 1965.

Reports of 546 nonhuman isolations of salmonellae were received during September, a decrease of 317 (36.7 percent) from August 1966.

II. REPORTS OF ISOLATIONS FROM THE STATES

A. Human

The seven most frequently reported serotypes during September were:

Rank	Serotype	Number	Percent	Rank Last Month
1	S. typhi-murium and S. typhi-murium var. copenhagen	560	30.7	1
2	S. heidelberg	157	8.6	2
3	S. enteritidis	130	7.1	5
4	S. infantis	120	6.6	4
5	S. newport	115	6.3	3
6	S. saint-paul	45	2.5	7
7	S. blockley and	44	2.4	Not Listed
7	S. thompson	44	2.4	6
	Total	1,215	66.6	
	Total (all serotypes)	1,824		

The age and sex distribution (Table III) is similar to previous months.

B. Nonhuman

Fifty-three different serotypes were reported from nonhuman sources by 33 states.

The seven most frequently reported serotypes during September were:

Rank	Serotype	Predominant Source and Number	Number	Percent	Rank Last Month
1	S. typhi-murium and S. typhi-murium var. copenhagen	Chicken (17) and Turkey (11)	76	13.9	1
2	S. heidelberg	Turkey (42) and Chicken (17)	70	12.8	2
3	S. anatum	Sewage (9) and Sewer swab (7)	38	7.0	3
4	S. infantis	Chicken (15) and Animal feed (10)	31	5.7	Not Listed
5	S. saint-paul	Turkey (25)	30	5.5	Not Listed
6	S. montevideo	Chicken (11)	26	4.8	Not Listed
7	S. cubana	Carmine dye (19)	25	4.6	Not Listed
	Total		296	54.3	
	Total (all serotypes)		546		

The most common nonhuman sources of salmonellae reported during September were turkeys, 152 (27.8 percent); chickens, 89 (16.3 percent); livestock feed, 52 (9.5 percent); sewage, 38 (7.0 percent); and animal feed, 23 (4.2 percent).

III. CURRENT INVESTIGATIONS

NONE

IV. REPORTS FROM THE STATES

NONE

V. SPECIAL REPORTS

NONE

VI. INTERNATIONAL

A. Belgium

Report of Isolations of Salmonella from Human Sources - Third Quarter 1966. Reported by E. van Oye, M.D., National Salmonella and Shigella Center of Belgium.

During the third quarter of 1966, 1,118 isolations of salmonellae from human sources were reported. The five most common serotypes are shown in the table below.

Rank	Serotype	Number	Percent
1	S. typhi-murium	774	69.2
2	S. panama	115	10.3
3	S. brandenburg	74	6.6
4	S. infantis	30	3.3
5	S. heidelberg	26	2.3

The twofold increase in number of isolations as compared to the second quarter of 1966 is consistent with the expected summer seasonal increase. Salmonella adelaide, S. javiana, and S. muenster were isolated for the first time from humans in Belgium.

B. Czechoslovakia

Salmonella Surveillance in Czechoslovakia - 1965. Reported by Dr. D. Matejovska, CSc., Institute of Epidemiology and Microbiology, Prague.

There were 6,915 human isolations of salmonella including 45 different serotypes reported in Czechoslovakia in 1965. The ten most common serotypes isolated from man are shown in the following table. The order of the serotypes is remarkably similar to previous years.

Rank	Serotype	Number	Percent
1	S. typhi-murium	1,964	28.4
2	S. enteritidis	1,735	25.1
3	S. anatum	1,474	21.3
4	S. newport	300	4.3
5	S. derby	253	3.7
6	S. muenchen	224	3.2
7	S. paratyphi B	194	2.8
8	S. bareilly	185	2.7
9	S. meleagridis	87	1.3
10	S. bovis-morbificans	66	1.0

There were 10,907 isolations from animal and animal products reported to the Central State Veterinary Institutes, and the most common sources were pigs, cattle, and fowl.

VII. FOOD AND FEED SURVEILLANCE

A. Progress Report on Food Surveillance

Fifteen cake mix samples were received from Illinois and not included on last month's report. These were examined for salmonellae, shigellae, Escherichia coli, and coagulase positive staphylococci, and all were found to be negative.

One hundred seventy-four meat samples from seven states were examined for salmonellae, shigellae, E. coli, and coagulase positive staphylococci (Table VII). Most of the samples were from beef; ground beef was most frequently contaminated. Both E. coli and coagulase positive staphylococci were isolated from samples from every state represented in Table VII. Twenty of the 25 samples from Florida contained coagulase positive staphylococci. Five of 27 samples from New Mexico, 2 samples from New York City, and 1 sample from Virginia were positive for salmonellae. Three of the 5 positive samples from New Mexico, however, were from one source. Salmonellae were not found in meat products from other states.

All samples were negative for shigellae. Serotyping and phage typing results are not complete.

B. Salmonella Contamination in a Precooked Pork Product. Abstracted from a presentation by M. Goldfield; presented at Salmonellosis Seminar sponsored by the Philadelphia Chapter Institute of Food Technology and the Philadelphia Health Department, January 11, 1966.

Recent salmonella investigations conducted in the New Jersey State Health Department concerned a single pork product prepared into a roll and cooked "ready-to-eat." The seven plants in the state processing this product were visited; 42 samples were obtained during the processing procedure, and 30 were taken from the final cooked product. All samples were cultured for salmonellae.

Salmonellae were recovered from 29 (41.4%) of the 72 samples, including 8 from the finished cooked product. Multiple isolations were obtained from several of the 29 positive samples, with a total of 40 salmonella isolations. Twelve different serotypes were identified, including 5 of the 7 types most frequently found to be associated with human infections in the United States during 1965. Interestingly, S. derby was the most frequently identified serotype, accounting for 11 of the 40 isolations.

During the study, several different methods of isolation were tried. The meat was inoculated in aliquots of 30 gm into 100 ml each of nutrient, tetrathionate and

selenite F broths. In addition, nutrient broth, after 24 hours of incubation, was used to inoculate an additional tube of tetrathionate. Subculture to plating media and incubation times and temperatures are indicated in Table VIII.

Only 1 of the 40 salmonella isolates was obtained by all of the techniques. Twenty-five of the 40 isolations were obtained from only one of the enrichment procedures. Selenite F enrichment at 43.5 C. and tetrathionate broth inoculated from a 24-hour culture in nutrient broth proved the most effective for this particular food product, but even these each yielded only 53 percent of the total number of isolates. Inoculation of plating media after each 24-hour period of incubation was important. Five isolates were obtained from selenite after a 24-hour period but not subsequently, and similarly, an additional three were each detected only at 48 hours and 72 hours, respectively.

Figure 1.

REPORTED HUMAN ISOLATIONS OF SALMONELLA
IN THE UNITED STATES

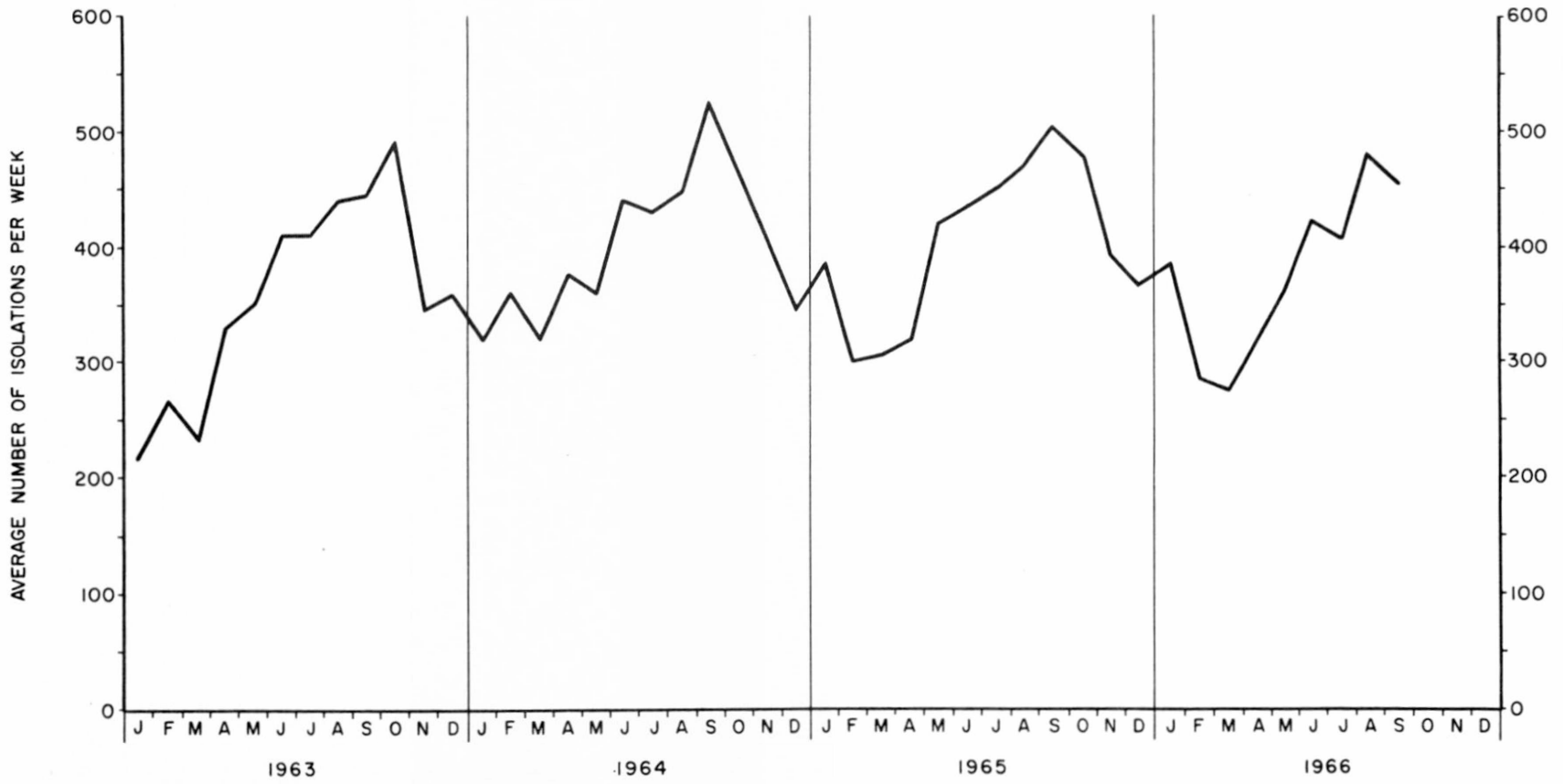

TABLE I
COMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS IN THE UNITED STATES DURING SEPTEMBER, 1966

SEROTYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																															SEROTYPE
	NEW ENGLAND							MIDDLE ATLANTIC						EAST NORTH CENTRAL						WEST NORTH CENTRAL								SOUTH ATLANTIC								
	MD	ME	VT	MASS	RI	CONN	TOT	NY-A	NY-BI	NY-C	NJ	PA	TOT	OHIO	IND	ILL	MICH	WIS	TOT	MINN	IOWA	MO	ND	SC	NEBR	KAN	TOT	DEL	MD	DC	VA	WV	NC	SC	GA	FLA	TOT	
anatum				9			9			1			1			3	1		4														3		3	anatum
bareilly								2	2				4			2		1	3											4					4	bareilly
berta																													1						1	berta
blockley				1		1	2	1	2	1	1		5	1		3	1		5	3	1					4	2	2			1			1	6	blockley
braenderup				5		1	6		1	2			3		1				1						2	2					1				1	braenderup
bredeney						2	2	1	1				2																							bredeney
chester																	1	1	2	2						2			1							1	chester
cholerae-suis v kun																																1		2		3	cholerae-suis v kun
cubana											1		1	1		4	2		7															1	1	cubana
derby				19			19	3	3	1			7	1				1	2										3		3		2		1	9	derby
enteritidis				29		8	37	12	2	9	3	5	31	2	1	14	6		23	2		1				2	5	1	6	1	7		1				16	enteritidis
give				1			1																									1				1	give
heidelberg	1			2		1	4	4	5	6	5	18	38	1	4	12	11	2	30	1	2				1	1	5		8	2	5	1	10		3	1	30	heidelberg
indiana									1				1																			1				1	indiana
infantis				17			17	7	3	4		4	18	1	2	9	5		17		2	1				9	12	2		2	4		1			3	12	infantis
java								3		1	1		5			6			6							1	1								1	1	java
javiana											1		1								1					1	2								7	7	javiana
kentucky																				1							1										kentucky
litchfield								1		1			2			1		4	5							1	1			1						1	litchfield
livingstone				1			1			1			1																								livingstone
manhattan				2			2			1	2		3			1	1	1	3	1							1								1	1	manhattan
meleagridis																																					meleagridis
miami																						1					1					1			4	5	miami
mississippi																																		3		3	mississippi
montevideo				4	1	1	6	6		2	3		11	2				2	4			1					1			1				1		2	montevideo
muenchen				1		1	2		3	1			4				1		1							2	2		1		1			1		3	muenchen
newington																	1		1	1							1										newington
newport				1			1		5	2	4	1	12	1	1	7	1		10	5						6	11		2		1		1		2	15	21	newport
oranienburg				2			2					1	1		1	5	3	1	10	1						2	3								2	2	oranienburg
panama				2		1	3		1	3			4	3		1	3		7			1					1	1									1	panama
paratyphi B				3			3										2		2											1					1	2	paratyphi B
poona																																					poona
saint-paul				1		1	2				7	1	8	2			1	1	4	3							3							1	1	2	saint-paul
san-diego								1	1				2			1			1												1					1	san-diego
schwarzengrund															2	1			3																		schwarzengrund
senftenberg								1					1				1		1															1		1	senftenberg
tennessee				5			5	1					1				1		1																		tennessee
thompson				6			6	4	2	3	3		12	1	2	3	6	4	16	1							1				1		1		2	4	thompson
typhi	1					1	2	1		4		2	7	3	1				4			2				1	3				1		2	1	1	5	typhi
typhi-murium				59	3	4	66	34	19	31	11	23	118	7	7	35	24	9	82	9	8	11	1			12	41	1	13	6	16	1	8		8	12	65	typhi-murium
typhi-murium v cop				11		1	12	1			2		3				2		2		2						2										typhi-murium v cop
urbana																				1							1										urbana
weltevreden																																					weltevreden
worthington															1				1															1	1	2	worthington
untypable group B		3			2		5				3		3			2			2		1					1				4			4			8	untypable group B
untypable group C1					2		2																							1						1	untypable group C1
untypable group C2																																					untypable group C2
untypable group D		2					2																							2						2	untypable group D
untypable group E																														1						1	untypable group E
untypable or unknown					1		1											1	1				1			1	1			1			2			3	untypable or unknown
Total Common	2	5	0	181	9	23	220	83	51	74	47	55	310	26	23	110	74	28	261	31	16	19	2	0	1	40	109	7	36	21	46	3	32	7	27	54	233	Total Common
Total Uncommon	0	0	0	0	0	0	0	1	2	2	3	0	8	0	1	2	0	0	3	1	0	2	0	0	0	0	3	1	0	0	0	0	9	0	4	9	23	Total Uncommon
Grand Total	2	5	0	181	9	23	220	84	53	76	50	55	318	26	24	112	74	28	264	32	16	21	2	0	1	40	112	8	36	21	46	3	41	7	31	63	256	Grand Total

(New York, A-Albany, BI-Beth Israel, C-City)

*The Beth-Israel Salmonella Typing Center in New York is a reference laboratory and processes many cultures from other states which are assigned to the respective states although reported by N.Y.-B.I. Beth-Israel reported a total of 200 isolations for September.

TABLE I (Continued)
COMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS IN THE UNITED STATES DURING SEPTEMBER, 1966

SEROTYPE	GEOGRAPHIC DIVISION AND REPORTING CENTER																							TOTAL	% OF TOTAL	1966 CUM. TOTAL	% OF 1966 CUM. TOTAL	1965 CUM. TOTAL	% OF 1965 CUM. TOTAL	SEROTYPE
	EAST SOUTH CENTRAL					WEST SOUTH CENTRAL					MOUNTAIN									PACIFIC					OTHER						
	KY	TENN	ALA	MISS	TOT	ARK	LA	OKLA	TEX	TOT	MONT	IDA	WYO	COLO	NM	ARI	UTAH	NEV	TOT	WASH	ORE	CAL	ALAS	HAI	TOT	VI						
anatum							3			3																	20	1.1	233	1.6	218		anatum
bareilly							1		1	2																	13	.7	59	.4	86		bareilly
berta							1			1																	2	.1	27	.2	29		berta
blockley							2	2	2	6				4					4	4		5		3	12		44	2.4	454	3.1	268	1.7	blockley
braenderup		2	1		3				2	2							1		1								19	1.0	85	.6	62		braenderup
bredeney																				1		1		5	7		11	.6	96	.7	110		bredeney
chester																						1			1		6	13	86	16	90		chester
cholerae-suis v kun																											3	.2	21	.1	26		cholerae-suis v kun
cubana																					1				1		10	.5	116	.8	119		cubana
derby							1			1												1		3	4		42	2.3	297	2.0	511	3.3	derby
enteritidis	1	3			4	1	1		1	3											1	10			11		130	7.1	926	6.3	788	5.1	enteritidis
give							4			4														1	1		7	.4	64	.4	89		give
heidelberg	1	1	2		4	1	13		2	16				4		2	1		7		2	18		3	23		157	8.6	1,237	8.4	1,210	7.8	heidelberg
indiana																											2	.1	56	.4	44		indiana
infantis	2	1			3		6		3	9				2		1			3	3	1	21	1	3	29		120	6.6	1,061	7.2	858	5.5	infantis
java											1						1		2			4			4		19	1.0	286	1.9	127		java
javiana		1			1	1	7	2	7	17						1			1		1				1		30	1.6	177	1.2	221		javiana
kentucky							1			1																	2	.1	17	.1	8		kentucky
litchfield									1	1												3			3		13	.7	54	.4	63		litchfield
livingstone																											2	.1	19	.1	21		livingstone
manhattan																				3		2			5		15	.8	84	.6	92		manhattan
meleagridis																													4	.0	136		meleagridis
miami																						1			1		7	.4	57	.4	67		miami
mississippi			1		1		1		2	3																	7	.4	38	.3	27		mississippi
montevideo	1	1	1		3		3		1	4											1	4		1	6		37	2.0	249	1.7	360	2.3	montevideo
muenchen			1		1		2		1	3						1			1								17	.9	152	1.0	162		muenchen
newington																				1					1		3	.2	34	.2	44		newington
newport	1	3	1		5		20	3	12	35						4			4		3	9		4	16		115	6.3	887	6.0	867	5.6	newport
oranienburg		2	1		3		2	1	6	9				1		2			3			5			5		38	2.1	311	2.1	470	3.0	oranienburg
panama	1				1		1		2	3														4	4		24	1.3	192	1.3	176		panama
paratyphi B		1			1			1		1				1					1	1					1		11	.6	115	.8	134		paratyphi B
poona									1	1												3			3		4	.2	29	.2	36		poona
saint-paul	1				1		1	1	1	3				4					4		6	8		4	18		45	2.5	544	3.7	560	3.6	saint-paul
san-diego	1		1		2												2		2	1	1	2		1	5		13	.7	109	.7	207		san-diego
schwarzengrund							2			2																	5	.3	49	.3	80		schwarzengrund
senftenberg							3		1	4																	7	.4	46	.3	56		senftenberg
tennessee							1		1	2		3							3					1	1		13	.7	99	.7	152		tennessee
thompson							2	1		3										1		1			2		44	2.4	455	3.1	430	2.8	thompson
typhi		2			2		2		5	7					1		1		2			4		1	5		37	2.0	510	3.5	567	3.6	typhi
typhi-murium	4	4	5	1	14	2	21	3	23	49	9			11					20	11	7	61		2	81		536	29.4	4,185	28.4	4,893	31.4	typhi-murium
typhi-murium v cop							4			4		1							1								24	1.3	126	.9	142		typhi-murium v cop
urbana																						1			1		2	.1	19	.1	24		urbana
weltevreden																								4	4		4	.2	29	.2	27		weltevreden
worthington																											3	.2	30	.2	34		worthington
untypable group B				6	6	6				6					9			1	10								41	2.2	267	1.8	219		untypable group B
untypable group C1						5				5					11				11								19	1.0	87	.6	66		untypable group C1
untypable group C2						6				6					1				1								7	.4	40	.3	45		untypable group C2
untypable group D						5				5					1				1				1		1		11	.6	43	.3	28		untypable group D
untypable group E						1				1					1				1								3	.2	10	.1	46		untypable group E
untypable or unknown				1	1	3				3											1	1			2		12	.7	60	.4	94		untypable or unknown
Total Common	13	21	14	8	56	31	105	14	75	225	10	4	0	27	24	11	6	1	83	26	25	166	2	40	259		1,756	96.3	14,231	96.6	15,585		Total Common
Total Uncommon	0	1	0	0	1	0	8	1	12	21	1	0	0	1	0	0	1	0	3	0	1	3	0	2	6		68	3.7	508	3.4	0		Total Uncommon
Grand Total	13	22	14	8	57	31	113	15	87	246	11	4	0	28	24	11	7	1	86	26	26	169	2	42	265		1,824	100.0	14,739	100.0	15,585		Grand Total

TABLE II

UNCOMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING 1966

SEROTYPE	REPORTING CENTER																												
	ALA	ALAS	ARI	ARK	CALIF	COLO	CONN	DEL	DC	FLA	GA	HAI	IDA	ILL	IND	IOWA	KAN	KY	LA	ME	MD	MASS	MICH	MINN	MISS	MO	MONT	NEBR	NEV	NH	NJ	NM
aberdeen					1																										
abortus-bovis														2																	
agama																	1														
alachua					1					1									1												
albany					2					2									1			2		1								
amager											1																1				
arkansas																			1												
atlanta											13																				
austin																										1					
ball					2																										
berlin																															
binza					3	1				2								1	2					2						1	
bonaire					1																										
bonariensis														1																	
bovis-morbificans		1			1					1									1				1								
bradford						2											1													1	
brandenburg											1																				
california					2						2			1	1				6												
carrau																			3												
cerro												3		1			1				1										
chailey					5																										
cholerae-suis						1																1									
coleypark										2																					
colorado																			1												
concord																															
corvallis														1																	
daytona										1																					
drypool											1																				
dublin					2																										
duesseldorf					1			1											2											1	
duisburg																															
eimsbuettel										2									1												
fayed																															
gallinarum																															
gaminara										1									5												
garoli																															
glostrup														1							1										
grumpensis																															
habana														1									1								
haifa									1		1																				
hartford					2					7	1			3					1			1	1	1						1	
ibadon																															
inverness														1										1							
irumu						2																				1					
kaapstad						1																									
kottbus																															
lanka					1																										
loma-linda																															
luciana										1																					
madelia										1																					
manchester						1									1																
menston																	2														
minnesota					2											1															
mission										2																					
mjimwema																															
molade																															
muenster			1		1					4				2					1											1	
nagoya																															
new-brunswick	1	2			2		2			4	2				1				7		2	5	2	2							
new-haw																															
newlands						1																									
nienstedten																															
norwich				1		1				2									1							1					
ohio					7																										
orion																															
oritamerin																															
os																			3												
oslo					4							13					1														
paratyphi-A					1																1										
paratyphi-B v odense																							2								
paratyphi-C						1																									
pomona																			1							1					
pullorum														9					1												
reading			1		12	2		3		1				17				4	1	2			3	2			1			2	
rubislaw					2					3									10			1									
saphra																															
sarajane																															
seremban									2																						
siegburg					2														1				1								
simsbury														1								1									
soahanina																															
stanley										1				2																	
stockholm																															
sundsvall														1																	
tallahassee										2																					
texas															1																
virchow																							3								
wassenaar																			1												
welasco											1																				
westerstede										4																					
untypable group A																														1	
untypable group G										1									1											2	
untypable group H																														1	
untypable group O					2																										
Total	1	3	2	1	59	13	2	4	3	45	23	16	0	44	4	1	6	5	52	2	5	11	14	9	0	4	2	0	0	0	7	4

TABLE II (Continued)
UNCOMMON SALMONELLA SEROTYPES ISOLATED FROM HUMANS DURING 1966

REPORTING CENTER																					SEPT. TOTAL	1966 CUM. TOTAL	MONTH LAST REPORTED	STATE LAST REPORTED	TOTAL PREVIOUSLY REPORTED TO SAL. SURV. UNIT 1962 - 1965	SEROTYPE
NY-A	NY-B1	NY-C	NC	ND	OHIO	OKLA	ORE	PA	RI	SC	SD	TENN	TEX	UTAH	VT	VA	VI	WASH	WV	WIS	WYO					
																				1		1	May 66	Cal	1	aberdeen
																						2	Jan 66	Ill	0	abortus-bovis
																						1	Jul 66	Kan	0	agama
		1																			1	4	Sep 66	Fla	21	alachua
																					1	8	Sep 66	La	15	albany
																					1	2	Sep 66	Mont	51	amager
																						1	Jul 66	La	1	arkansas
																					3	13	Sep 66	Ga	25	atlanta
																						1	Feb 66	Mo	1	austin
																						2	Jun 66	Cal	0	ball
								2														2	Aug 66	Pa	0	berlin
1								1													4	14	Sep 66	Cal-Colo-Fla-Minn	54	binza
																						1	Apr 66	Cal	0	bonaire
																						1	Jun 66	Ill	2	bonariensis
1																		2				8	Aug 66	Cal-Fla-Mich-Wash	44	bovis-morbificans
																						4	Jul 66	Colo-NJ	2	bradford
																						1	Apr 66	Ga	10	brandenburg
																1					4	13	Sep 66	La	64	california
													1									4	Aug 66	Tex	12	carrau
												2	1								2	9	Sep 66	Hai-Tex	28	cerro
																						5	Aug 66	Cal	1	chailey
	3				1																	6	Jun 66	NYBI	66	cholerae-suis
																						2	Aug 66	Fla	0	coleypark
																						1	Feb 66	La	8	colorado
		1																				1	Jun 66	NYC	4	concord
																						1	Aug 66	Ill	3	corvallis
																						1	Jun 66	Fla	5	daytona
		1																			2	2	Sep 66	Ga-NYC	0	drypool
																					1	2	Sep 66	Cal	8	dublin
		1																			2	6	Sep 66	Dela-NJ	7	duesseldorf
					2													2				4	Aug 66	Ohio	8	duisburg
1			7									1	1								7	13	Sep 66	La-NC-Tex	3	eimsbuettel
			8																		3	8	Sep 66	NC	6	fayed
	1																				1	1	Sep 66	NYBI	3	gallinarum
		1											1								2	8	Sep 66	Fla-NYC	20	gaminara
		1																				1	Mar 66	NYC	0	garoli
																						2	Aug 66	Ill	1	glostrup
																1						1	Apr 66	Va	11	grumpensis
		1																				3	Jul 66	Mich-NYC	0	habana
																						2	Aug 66	Ga	3	haifa
			1		1		1													4	2	25	Sep 66	Ill-NC	90	hartford
													1									1	Jun 66	Tex	0	ibadon
																						2	Aug 66	Ill	13	inverness
4	1																				2	8	Sep 66	Mo-NYBI	108	irumu
																						1	Mar 66	Colo	3	kaapstad
1																						1	Aug 66	NYA	14	kottbus
							1	1														1	Apr 66	Cal	0	lanka
																					1	2	Sep 66	Ore	17	loma-linda
																						1	Jul 66	Fla	2	luciana
																						1	Aug 66	Fla	6	madelia
																						2	Jul 66	Ind	5	manchester
																						2	Jul 66	Kan	14	menston
													2								1	5	Sep 66	Tex	40	minnesota
												2									1	4	Sep 66	Fla	7	mission
1																						1	Jan 66	NYA	0	mjimwema
																				1		1	Feb 66	Wisc	0	molade
								5												1	1	16	Sep 66	Fla	26	muenster
													1									1	May 66	Tex	1	nagoya
3		1					2	1								2		4		1	2	39	Sep 66	Fla	32	new-brunswick
																						7	Aug 66	La	2	new-haw
																						1	Jun 66	Colo	0	newlands
		1			1	1	1					3	4	1							1	1	Sep 66	Utah	0	nienstedten
					1																4	17	Sep 66	Mo-Tex	51	norwich
					3																1	8	Sep 66	Cal	13	ohio
																						3	Jul 66	Ohio	7	orion
		1																				1	Mar 66	NYC	0	oritamerin
																						3	Mar 66	La	0	os
																					1	18	Sep 66	Hai	15	oslo
																						2	May 66	Md	34	paratyphi-A
																						2	Jul 66	Mich	1	paratyphi-B v odense
																						1	Mar 66	Colo	7	paratyphi-C
																						2	May 66	Mo	4	pomona
																						10	May 66	La	4	pullorum
6							1	15				6	1					2		2	4	83	Sep 66	Ill-NJ-Tex	102	reading
							1					1	4								6	22	Sep 66	La-Okla-Tenn-Tex	42	rubislaw
													5								3	5	Sep 66	Tex	19	saphra
					2																	2	Jul 66	Ohio	1	sarajane
																						2	Aug 66	DC	0	seremban
1												2	2								1	9	Sep 66	NYA	19	siegburg
																						2	Jul 66	Mass	16	simsbury
													1									1	Aug 66	Tex	0	soahanina
			1																			4	Jul 66	Fla-Ill	26	stanley
					1																	1	May 66	Ohio	0	stockholm
													1									2	Aug 66	Ill-Tex	4	sundsvall
			1																			3	Jul 66	Fla	14	tallahassee
																					1	1	Sep 66	Ind	0	texas
								1														4	May 66	Ore	16	virchow
																						1	Apr 66	La	0	wassenaar
																						1	Jul 66	Ga	2	welasco
		1																			2	5	Sep 66	Fla	5	westerstede
																						1	Jul 66	NM		untypable group A
																						4	Jul 66	NM		untypable group G
																						1	Jun 66	NM		untypable group H
																						2	Jan 66	Cal		untypable group O
19	5	11	18	0	12	5	20	9	0	0	0	17	26	1	0	4	0	10	0	9	0	68	508				Total

TABLE III

Age and Sex Distribution of Individuals Reported as Harboring Salmonellae During September 1966

Age (Years)	Male	Female	Unknown	Total	%	Cumulative %
Under 1	100	98	4	202	17.4	17.4
1 - 4	132	129	1	262	22.5	39.9
5 - 9	90	68		158	13.6	53.5
10 - 19	73	59	1	133	11.4	64.9
20 - 29	33	54		87	7.5	72.4
30 - 39	25	49		74	6.4	78.8
40 - 49	27	55	1	83	7.1	85.9
50 - 59	21	40	1	62	5.3	91.2
60 - 69	21	30		51	4.4	95.6
70 - 79	18	17		35	3.0	98.6
80+	9	6		15	1.3	99.9
Child (unspec.)	15	10	6	31		
Adult (unspec.)	6	22	1	29		
Unknown	272	283	47	602		
Total	842	920	62	1824		
% of Total	47.8	52.2				

TABLE IV

REPORTED NONHUMAN ISOLATES BY SEROTYPE AND SOURCE, *SEPTEMBER 1966

Serotype	chicken	turkey	duck	pigeon	pheasant	avain	equine	bovine	ovine	porcine	goat	mouse	guinea pig	gorilla	mink	raccoon	elephant	egg	powdered egg	frozen egg	sausage	headcheese	meatball	dry milk	deviled egg	egg salad	noodles	blueberry crisp	cheese spread	egg plant	poultry feed	livestock feed	bird feed	bone meal/ meat scraps	animal feed, unknown	fish meal	animal protein meal	turtle	snake	lizard	water	sewage	stream/lake water	turtle water	environmental swab	milk drying plant	sewer swab	carmine dye	dust	unknown	Total	9 Mos. Total	Serotype
alachua																															1																		1	24	alachua
albany	1																																																	1	2	albany
anatum		6						1	1								1			4				1						5												9				2	7			1	38	291	anatum
binza					1																													1																2	46	binza
blockley	2	10													1																																				13	155	blockley
bredeney	1	2																																									1			1					5	50	bredeney
california																															2																				2	26	california
cerro	2																																	3																	5	51	cerro
chester	2	10																																																	12	105	chester
cholerae-suis v kun										5																																									5	73	cholerae-suis v kun
cubana																			4												1																1	19			25	96	cubana
derby	1	4																			1	1									1												6				1				15	137	derby
drypool																															3												1								4	6	drypool
eimsbuettel																															3												6				3				13	97	eimsbuettel
enteritidis	3												1																																						4	77	enteritidis
gallinarum	1																																																		1	12	gallinarum
give																					1																															4	37	give
heidelberg	17	42				1		1			1												1												3															4	70	516	heidelberg
illinois																																																		1	2	6	illinois
infantis	15	1											1								1													10																		31	238	infantis
java																																									2										2	40	java
javiana																															1																				1	2	javiana
johannesburg	1																																			1														2	3	johannesburg
kentucky	1									1																				1																			1	5	29	kentucky
livingstone																																	1		3														2	6	69	livingstone
manhattan		1																																1																2	33	manhattan
manila																															1														1					2	5	manila
menston																																		1																1	1	menston
minnesota																															2														1					4	40	minnesota
montevideo	11							2																							7			1	1														3	26	243	montevideo
muenchen	1	2																													1																				4	51	muenchen
muenster																															1																				1	17	muenster
newington		1											1																		1												1				2	1			7	61	newington
newport		1																													1												2				1				7	101	newport
oranienburg																		1						1				1			1			5										1								10	155	oranienburg
panama		2																																				1														3	18	panama
poona																																							4														4	11	poona
pullorum	3																																																			3	51	pullorum
reading		1								1																																										2	56	reading
saint-paul	3	25								2																																										30	236	saint-paul
san-diego		7																																																	1	9	84	san-diego
schwarzengrund		14																																1		1											3	1			20	174	schwarzengrund
senftenberg		7																																1		1													1		20	143	senftenberg
siegburg																				4														2																	6	10	siegburg
simsbury																																		1																	1	7	simsbury
tennessee	1	4				1			1																									2																	9	148	tennessee
thomasville																																		2																	2	26	thomasville
thompson	5	1																																					3					3					12	155	thompson
typhi-murium	11	10	2		1	2	2	7		6		1	1	2		2	1								1	1	1			1	1												3	1		1				60	679	typhi-murium
typhi-murium v cop	6	1		3		1				1			2				1																										1								16	163	typhi-murium v cop
urbana																																			1													1			2	11	urbana
waycross																																									1										1	1	waycross
worthington	1									1		1																					4																		12	65	worthington
untypable group B								1																																											1	11	untypable group B
Total	89	152	2	3	2	5	2	12	2	17	1	3	4	2	3	2	1	1	4	8	3	1	1	2	1	1	1	1	1	1	2	52	1	10	23	1	1	13	1	1	1	38	4	3	4	14	14	19	4	12	546	5,293	Total

Source: National Disease Laboratory, Ames, Iowa, weekly Salmonella Reports from individual states and US-FDA-Div of Microbiology, Washington, D. C.

*Includes August late reports

TABLE IV

REPORTED NONHUMAN ISOLATES BY SEROTYPE AND SOURCE, *SEPTEMBER 1966

Serotype	chicken	turkey	duck	pigeon	pheasant	avain	equine	bovine	ovine	porcine	goat	mouse	guinea pig	gorilla	mink	raccoon	elephant	egg	powdered egg	frozen egg	sausage	headcheese	meatball	dry milk	deviled egg	egg salad	noodles	blueberry crisp	cheese spread	egg plant	poultry feed	livestock feed	bird feed	bone meal/ meat scraps	animal feed, unknown	fish meal	animal protein meal	turtle	snake	lizard	water	sewage	stream/lake water	turtle water	environmental swab	milk drying plant	sewer swab	carmine dye	dust	unknown	Total	9 Mos. Total	Serotype
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anatum		6						1	1								1			4										5														9				2	7			1	38	291	anatum
binza					1																														1																2	46	binza
blockley	2	10													1																																				13	155	blockley
bredeney	1	2																																															1			5	50	bredeney
california																															2																				2	26	california
cerro	2																																		3																5	51	cerro
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cholerae-suis v kun										5																																									5	73	cholerae-suis v kun
cubana																			4												1																1	19			25	96	cubana
derby	1	4																			1	1									1													6				1				15	137	derby
drypool																															3													1								4	6	drypool
eimsbuettel																															3													6				3				13	97	eimsbuettel
enteritidis	3												1																																							4	77	enteritidis
gallinarum	1																																																		1	12	gallinarum
give																					1																							2								4	37	give
heidelberg	17	42				1		1			1												1												3														4		70	516	heidelberg
illinois																															1																			1	2	6	illinois
infantis	15	1													1						1														10							1	1				1				31	238	infantis
java																																																		2	40	java
javiana																															1																				1	2	javiana
johannesburg	1																																			1															2	3	johannesburg
kentucky	1									1																					1																			1	5	29	kentucky
livingstone																																1		3															2	6	69	livingstone
manhattan		1																															1																	2	33	manhattan
manila																															1													1						2	5	manila
menston																																	1																		1	1	menston
minnesota														1																	2													1						4	40	minnesota
montevideo	11							2																							7		1	1															3	26	243	montevideo
muenchen	1	2																													1																				4	51	muenchen
muenster																															1																				1	17	muenster
newington		1										1																			1													1				2	1		7	61	newington
newport		1																													1													3				1			7	101	newport
oranienburg																		1						1				1			1		5											1							10	155	oranienburg
panama		2																																																	3	18	panama
poona																																									4										4	11	poona
pullorum	3																																																		3	51	pullorum
reading		1								1																																									2	56	reading
saint-paul	3	25								2																																									30	236	saint-paul
san-diego		7																																																1	9	84	san-diego
schwarzengrund		14																																	1		1								3	1				20	174	schwarzengrund
senftenberg		7																															9		1	1											1			20	143	senftenberg
siegburg																				4													2																		6	10	siegburg
simsbury																																	1																		1	7	simsbury
tennessee	1	4				1			1																										2																9	148	tennessee
thomasville																																			2																2	26	thomasville
thompson	5	1																																					3					3					12	155	thompson
typhi-murium	11	10	2		1	2	2	7		6		1	1		2	1									1	1	1		1	1													3	1		1			3	60	679	typhi-murium
typhi-murium v cop	6	1		3		1				1			2			1																																			16	163	typhi-murium v cop
urbana																																			1														1		2	11	urbana
waycross																																																			1	1	waycross
worthington	1									1		1																							4														3		12	65	worthington
untypable group B								1																																											1	11	untypable group B
Total	89	152	2	3	2	5	2	12	2	17	1	3	4	2	3	2	1	1	4	8	3	1	1	2	1	1	1	1	1	1	2	52	1	10	23	1	1	13	1	1	38	4	3	4	14	14	19	4	13	546	5,293	Total

Source: National Disease Laboratory, Ames, Iowa, weekly Salmonella Reports from individual states and US-FDA-Div of Microbiology, Washington, D. C.

*Includes August late reports

TABLE VI
OTHER SEROTYPES REPORTED DURING 1966
FROM NONHUMAN SOURCES

SEROTYPE	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
abortus-bovis	Mar	La	1
adelaide	Mar	La	1
alagbon	Mar	NJ	2
amager	May-Jul	Ark	2
amsterdam	Jan	Ohio	1
babelsburg	Jan	Ind	1
bareilly	Mar-Apr	Cal(2)	
	Mar-Apr-May-Aug	La(5)	
	Apr	Ind(1)	
	May	Ill(1)	
	Jun	DC(1)	
	Jun	Mich(2)	
	Jul	Wash(1)	
	Aug	Iowa(1)	
	Aug	Minn(2)	
	Aug	Neb(6)	
	Aug	Utah(1)	23
berta	Feb	Ga(2)	
	May	Cal(1)	3
birmingham	Jun	La	1
bovis-morbificans	Jan	Cal(1)	
	Aug	DC(2)	3
bradford	Jan	NJ	1
braenderup	Jan-Feb	Ark(4)	
	Jan	Cal(1)	
	Jan	Miss(1)	
	Feb	Ala(1)	
	Feb	Tex(1)	
	Mar	Va(1)	
	Apr-Jul	Conn(6)	15
cambridge	Apr	La	1
caracas	Mar	La	1
carrau	Apr	Mass	2
champaign	Mar	La	2
cholerae-suis	Feb	Cal(1)	
	Aug	Miss(2)	3
colorado	Mar	NJ	1
corvallis	Apr-Jun	La	2
dublin	Jan-Feb-Mar-Apr-May Jun-Jul	Cal(26)	
	Jan-Mar-Apr-Aug	Utah(6)	32
emek	Jul	Tex	1

TABLE VI (Continued)
OTHER SEROTYPES REPORTED DURING 1966
FROM NONHUMAN SOURCES

SEROTYPE	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
eppendorf	Jan	NJ	1
fayed	Apr	La(1)	
	Apr	NC(1)	2
gaminara	Jul	La(1)	
	Aug	Tex(1)	2
grumpensis	Mar-Jul-Aug	La	5
habana	Apr	Md	1
halmstad	Mar	La	4
hamilton	Jan	La	1
hartford	Mar	Fla	1
indiana	Jan	Fla(1)	
	Jan	NJ(6)	
	Feb-Mar-Apr-May-Jun	Ind(14)	
	Feb	La(1)	
	Mar	Iowa(3)	
	Mar	Miss(1)	
	Mar	Pa(1)	
	Jun	Ill(1)	
	Jul	SC(1)	
	Aug	Mo(3)	32
kaapstad	Mar	La	1
kottbus	Feb	Ga	1
lexington	Jan	Cal(1)	
	Mar-May	La(3)	
	Mar	NJ(2)	
	May	Minn(1)	
	Jun	Wisc(1)	8
lille	Mar	NJ	1
litchfield	Apr	Cal(1)	
	May	Conn(4)	
	May	Ga(1)	
	May	Kan(2)	
	Jun-Jul	Fla(9)	
	Jul	Ohio(1)	
	Jul	Wash(1)	19
madelia	Jul	SC(1)	
	Aug	Cal(1)	2
meleagridis	Jan-Feb-Apr	Cal(4)	
	Feb-May-Jul	Wisc(3)	
	Mar-Aug	Ind(2)	
	Mar-May	La(2)	
	May	Minn(1)	12
miami	Feb	Cal(1)	
	Feb	Tex(1)	
	Jul	Fla(1)	
	Jul	Wash(1)	4
mikawashima	Jul	Ind	2
minneapolis	May	Cal	1
mission	Mar	Ohio(1)	
	May	La(1)	2

TABLE VI (Continued)
OTHER SEROTYPES REPORTING DURING 1966
FROM NONHUMAN SOURCES

SEROTYPE	MONTH(S)	REPORTING CENTER(S)	NUMBER OF ISOLATIONS
mississippi	Mar	La	1
new-brunswick	Mar-May	Ill(2)	
	Apr-May-Jun-Jul	Ind(34)	
	May-Jun	Minn(37)	
	Jun	Wisc(2)	
	Jul	Mich(2)	77
new-haw	Mar	NJ	1
norwich	Jul	Conn(1)	
	Jul	Mich(1)	
	Aug	Okla(2)	4
ohio	Feb	Iowa(7)	
	Feb	Minn(1)	
	Jun	NJ(1)	
	Jun	NYA(1)	10
orion	Jan	Miss(4)	
	Jan	Ohio(1)	
	Feb	Wisc(2)	
	Mar	Ill(1)	
	Apr	Ind(1)	
	May-Jun	La(2)	
	Jul	Minn(1)	12
oslo	Jan-Mar-May	Cal	5
paratyphi-B	Mar	Md(1)	
	Mar	Tex(1)	
	Apr-May	Ohio(3)	
	Jul	Wash(1)	6
pharr	Jan	Mich	1
pomona	Mar	NJ	1
portland	Jul	Wash	1
rubislaw	Jul	Conn(1)	
	Jul	La(2)	
	Aug	Ind(1)	4
seremban	Aug	Kan	1
stockholm	May	Ohio	1
taksony	Feb-Aug	Cal(2)	
	Apr	Md(1)	
	Jun	Ga(1)	4
teddington	Aug	La	1
tournai	Mar	NJ	1
tuebinger	Jan	Mich	1
typhi	Jan	Mo	1
typhi-suis	Feb-Mar	Cal(6)	
	Mar	Minn(1)	7
vejle	Apr	La	1
westhampton	Mar	Kan	1
Total			343

TABLE VII

Source	Total No. Samples	Total No. Brands	Type Food	No. Samples	No. Brands	Results No. Positive Samples: Salmonellae	Shigellae	E. coli	Coag. Pos. Staph.
Virginia	24	9	Beef Frankfurters	11	6	-	-	1	1
			Beef Steaks	4	2	-	-	2	1
			Ground Chuck	3	2	-	-	-	-
			Ground Beef	2	1	-	-	-	-
			Ground Beef with Spleens	2	1	1*	-	1	-
			Air Dried Beef	1	1	-	-	-	-
			Pork Sausage	1	1	-	-	1	1
			Total	24		1	-	5	3
Washington	23	3	Stew Beef	2	2	-	-	-	1
			Weiners	2	2	-	-	-	-
			Cube Steak	2	2	-	-	-	-
			Ox Tail	1	1	-	-	-	-
			Ground Round	2	2	-	-	-	-
			Short Ribs of Beef	2	2	-	-	-	1
			Chopped Sirloin	1	1	-	-	-	-
			Ground Beef	2	2	-	-	2	-
			Sirloin Tip Steak	2	2	-	-	-	-
			Top Round Steak	2	2	-	-	-	-
			T-Bone Steak	1	1	-	-	-	-
			Beef Shank	1	1	-	-	-	-
			Eye of Round Steak	1	1	-	-	-	-
			Beef Heart	1	1	-	-	-	-
			Beef Tongue	1	1	-	-	1	-
			Total	23		-	-	3	2
Florida	25	19	Ground Beef	20	18	-	-	2	16
			Ground Chuck	3	2	-	-	-	2
			Chopped Sirloin	2	1	-	-	-	2
			Total	25		-	-	2	20
Illinois	26	18	Beef Sausage	3	3	-	-	-	-
			Beef Bacon	1	1	-	-	-	-
			Smoked Pastrami	1	1	-	-	-	1
			Sliced Beef	5	5	-	-	1	-
			Beef Frankfurters	5	5	-	-	1	1
			Luncheon Meat	1	1	-	-	-	-
			Corned Beef	3	3	-	-	-	-
			Bologna	2	2	-	-	-	-
			Beef Steak	2	2	-	-	1	-
			Ground Beef	3	3	-	-	-	1
			Total	26		-	-	3	3
New York City	24	21	Ground Beef	13	12	1**	-	5	4
			Beef Frankfurters	10	10	-	-	2	2
			Beef Steak	1	1	1	-	-	-
			Total	24		2	-	7	6

TABLE VII(Continued)

Source	Total No. Samples	Total No. Brands	Type Food	No. Samples	No. Brands	Salmonellae	Shigellae	E. coli	Coag. Pos. Staph.
New Mexico	27	13	Ground Beef	21	11	5***	-	6	7
			Ground Round	2	2	-	-	-	-
			Beef Wieners	1	1	-	-	-	-
			Beef Bologna	2	2	-	-	-	-
			Ground Chuck	1	1	-	-	-	-
			Total	27		5	-	6	7
Louisiana	25	13	Horsemeat	1	1	-	-	-	-
			Filet Mignon	1	1	-	-	1	1
			Ground Beef	2	2	-	-	-	-
			Beef Frankfurters	1	1	-	-	-	1
			Stew Beef	1	1	-	-	-	-
			Beef Bologna	1	1	-	-	-	-
			Sliced Beef	3	2	-	-	1	-
			Eye of Round Steak	1	1	-	-	-	1
			Beef Tongue (ready to eat)	1	1	-	-	-	-
			Corned Beef (ready to eat)	3	2	-	-	-	-
			Beef Liver	1	1	-	-	-	-
			Veal Steak	2	2	-	-	-	-
			Chopped Beef Sirloin (bacon wrapped)	3	1	-	-	1	-
			Tenderloin Steak	1	1	-	-	-	-
			Beef Steaks	2	1	-	-	-	1
			Top Sirloin	1	1	-	-	-	-
			Total	25		-	-	3	4
			Grand Total	174		8	-	29	45

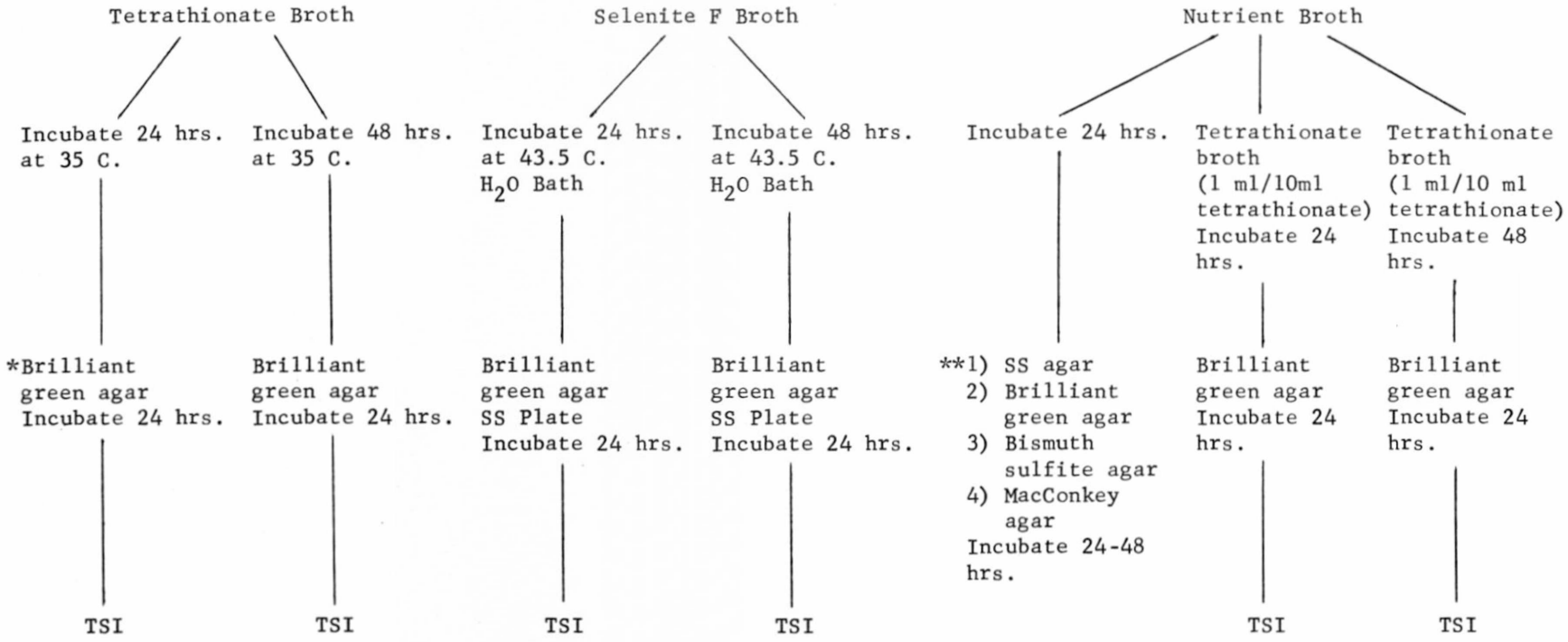
* Virginia - S. derby

** New York - S. muenster - 1
typing incomplete - 1

*** New Mexico - S. anatum - 2
S. javiana - 1
S. heidelberg - 1
typing incomplete - 1

TABLE VIII

Flow Sheet for Salmonella Isolation in Foods
30 gm. sample for 100 ml. broth



* Brilliant green agar contains sodium sulfadiazine, 8 mg. per 100 ml. of brilliant green agar.

** Plating of 4 different culture media from nonselective nutrient broth serves purpose of (1) rapid recovery of salmonella if present in large concentration and (2) to ascertain general nature of bacterial flora.