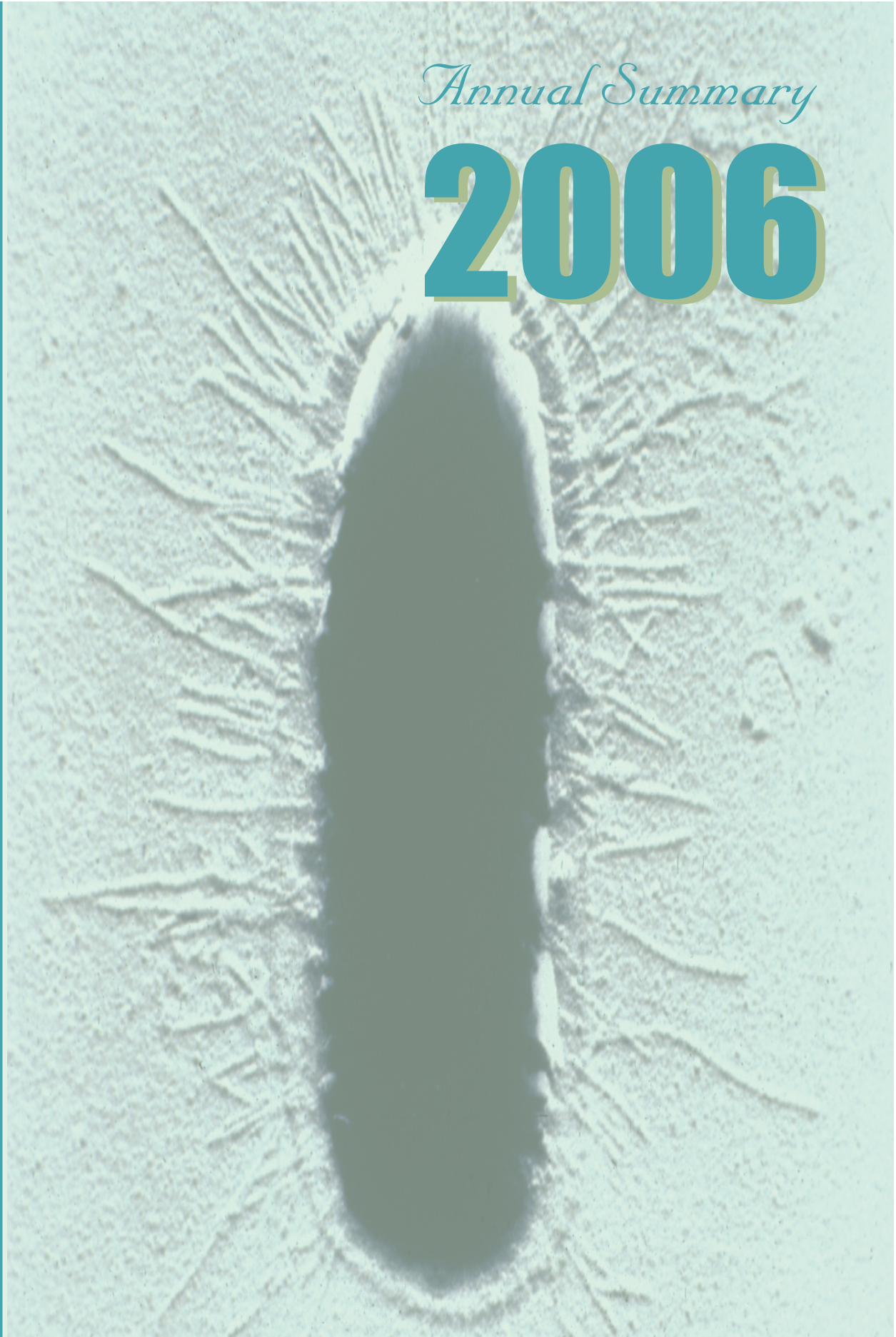
Salmonella

Annual Summary

2006



Department of Health and Human Services
Centers for Disease Control and Prevention
Coordinating Center for Infectious Diseases
National Center for Zoonotic, Vector-Borne and Enteric Diseases
Division of Foodborne, Bacterial and Mycotic Diseases
Atlanta, Georgia 30333

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Richard Bishop
Biostatistician, Northrop Grumman Contractor
Biostatistics Office

Patricia Fields, Ph.D.
Chief, National Salmonella Reference Laboratory
Enteric Diseases Laboratory Branch

Kelly Jackson, MPH.
National Surviellance Team
Enteric Diseases Epidemiology Branch

David Swerdlow, M.D.
Team Leader, National Surveillance Team
Enteric Diseases Epidemiology Branch

Martha Iwamoto, M.D.
National Surveillance Team
Enteric Diseases Epidemiology Branch

Division of Foodborne, Bacterial and Mycotic Diseases
National Center for Zoonotic, Vector-Borne and Enteric Diseases
Coordinating Center for Infectious Diseases
Centers for Diseases Control and Prevention

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Centers for Disease Control and Prevention
Division of Foodborne, Bacterial and Mycotic Diseases
Mail Stop: A38
1600 Clifton Road
Atlanta, Georgia 30333
Telephone: (404) 639-2206
http://www.cdc.gov/foodborne/index.htm

The Adobe Acrobat (PDF) version of this document can be viewed on the world-wide web at http://www.cdc.gov/ncidod/dbmd/phlisdata/salmonella.htm. Further information concerning data described in this report, including the Kauffmann-White Scheme or the changes in serotype classification instituted in this report, can be obtained by contacting the Enteric Diseases Epidemiology Branch at telephone number (404) 639-2206. For
further information concerning Public Health Information Laboratory System (PHLIS) please contact the PHLIS Helpdesk at telephone number (404) 639-3365.

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Table of Contents

National *Salmonella* Surveillance System
Annual Summary, 2006

This Annual Summary of the National *Salmonella* Surveillance System contains surveillance data on reported laboratory-confirmed *Salmonella* isolates in the United States for the year 2006. The National *Salmonella* Surveillance System collects reports of isolates of *Salmonella* from human sources from the United States. This information is reported through the Public Health Laboratory Information System (PHLIS), an electronic reporting system, by the State Public Health Laboratory Directors and State and Territorial Epidemiologists to the Enteric Diseases Epidemiology Branch (EDEB) and the Biostatistics Office (BSO) of the Division of Foodborne, Bacterial and Mycotic Diseases in the National Center for Zoonotic, Vectorborne, and Enteric Diseases.

The National *Salmonella* Surveillance System is based on data collected by state and territorial public health laboratories. *Salmonella* isolates are submitted to the state public health laboratory by clinical diagnostic laboratories. The state and territorial laboratories confirm the isolates as *Salmonella*, perform serotyping according to the Kauffmann-White scheme, and submit the data for reporting through PHLIS. Unusual or difficult isolates are forwarded to the National *Salmonella* Reference Laboratory at the Enteric Diseases Laboratory Branch (EDLB), Centers for Disease Control and Prevention (CDC) for further characterization for confirmation. These results are reported back to the state laboratory, where they are reported through PHLIS.

The capture of isolates in the National *Salmonella* Surveillance System is considered to be fairly complete. However, some *Salmonella* isolates may not be forwarded to public health laboratories, and therefore are not ascertained. In addition, many cases of salmonellosis are not reported because the ill person does not seek medical care, the health-care provider does not obtain a specimen for diagnosis, or the laboratory does not perform the necessary diagnostics tests. The results of surveillance reported herein should be considered a fraction of all *Salmonella* infections.

The National *Salmonella* Surveillance System database is dynamic; the number of isolates reported for previous years may change according to the addition or correction of isolate reports. Integrated surveillance system software development in several states and at the CDC has interrupted the normal use of the PHLIS system such that some *Salmonella* surveillance reports are delayed and obtained in a variety of formats outside of the PHLIS system. We encourage reporting partners to use the PHLIS reporting system if serotype specific *Salmonella* reports cannot be transmitted to CDC through new integrated surveillance systems. If PHLIS reporting is impossible, please contact the PHLIS Help Desk (404-639-3365) to arrange alternative data submission pathways.

The number of isolates reported by geographical area (e.g., state) represents the area where laboratory confirmation and serotyping was performed. In some instances, the reporting area is not the same as the area of residence of the person from whom the isolate was obtained. For *Salmonella* serotype Typhi, only the first isolation in a year for each person is counted. For serotypes other than Typhi, only the first isolation within a thirty day period for each person is counted, if the serotype and clinical source are the same.

The data presented for *Salmonella* isolates from animals and related sources (e.g., environment and feeds) are gathered from isolates submitted to the U.S. Department of Agriculture, Animal and Plant Health Inspection Services, National Veterinary Services Laboratories (USDA/APHIS/NVSL) for serotyping. These isolates are submitted by animal disease diagnostic laboratories and the USDA, Food Safety and Inspection Service (FSIS) laboratories throughout the United States. Data from other U.S. laboratories that serotype *Salmonella* from animals and related sources and that NSVL receives from are also included. *Salmonella* serotyping results from clinical cases of animal disease are designated as "clinical" (Table 6). Serotyping results from herd and flock monitoring and surveillance, feed sample testing, environmental testing, research projects, and from FSIS food testing programs are designated as "nonclinical" (Table 7). Samples from non-human sources are tested for *Salmonella* for a variety of purposes and are obtained in a variety of ways. The sampling is therefore neither complete nor random and undoubtedly has sampling biases. Any interpretation of data should consider these limitations.

The Statistical Outbreak Detection Algorithm (SODA), developed by BSO and EDEB, is a statistical

algorithm based on the National *Salmonella* Surveillance System. It is designed to detect unusual clusters of isolates of *Salmonella* infection. SODA compares current *Salmonella* isolates reported through PHLIS by serotype to a 5-year historical baseline for that serotype and week to detect unusual increases from the baseline. Analyses can be conducted at state, regional, or national levels. Since 1996, SODA has been implemented at CDC and selected state health departments. If you would like more information on SODA, please call the PHLIS Helpdesk at telephone number (404) 639-3365.

Changes to the National *Salmonella* Surveillance System

In 2002, the National *Salmonella* Surveillance System implemented several changes in nomenclature and in surveillance practices. First, in order to improve the comparability of United States surveillance data with data from other countries, serotypes are now designated according to the Kauffmann-White Scheme (see below). Second, reporting of *Salmonella* serotype I 4,[5],12:i:- (see discussion of this serotype below) was inconsistent in the past due to variability in the nomenclature used to report this serotype. This resulted in many isolates of this serotype being reported as "Group B" or "Subspecies I". Beginning with the 2002 data, the submitted designation for this serotype was converted to the standard formula whenever possible. Third, many non-subspecies I serotypes were not listed in the surveillance summaries in the past; instead, these isolates were reported by O group or subspecies only. Beginning with the 2002 surveillance data, all serotype formulas that were submitted to the national surveillance system, regardless of subspecies, were incorporated into the surveillance database. Finally, most "variants" of serotypes (monophasic, nonmotile or rough isolates) were not listed by their variant formulas in the past; instead, these isolates were reported by O group or subspecies only. Beginning with the 2002 surveillance data, all serotype variants that were submitted to the national surveillance system were converted to standard serotype formulas whenever possible and incorporated into the surveillance database. Since the 2003 *Salmonella* Surveillance Summary was published, we have updated the nomenclature for many isolates that were submitted in 1995 through 2003 when possible using additional information submitted to PHLIS. We hope that the changes in nomenclature and surveillance practices will improve the accuracy of the surveillance data and enhance the detection of newly emerging serotypes. However, these changes should be kept in mind when comparing recent data to previous years. The increased numbers of specific serotypes, e.g., *Salmonella* serotype I 4,[5],12:i:-, may reflect improved surveillance.

To improve the utility of partial serotype data, we are changing the way that isolates that are not fully serotyped are designated and reported in PHLIS. In the past, these isolates were reported primarily by serogroup. While serogroups A through E are composed mainly of subspecies I serotypes, many of the other O serogroups are represented in several different subspecies. Most of the serogroups higher than E include serotypes from more than one subspecies, and nearly half (15 of 37) include serotypes from five different subspecies. Reporting isolates by serogroup alone combines unrelated isolates of different subspecies in the same serogroup category. Thus, we would like to move away from the "serogroup" categories. When full serotype information is not available, isolates are identified first by subspecies, then O serogroup and any additional serotype antigens. All available serotype information should be submitted to PHLIS (subspecies, O serogroup, O antigens, H antigens, whether one or two H antigens are detected, rough or mucoid status if appropriate). Partially serotyped isolates are listed in Table 3a.

Challenges for the Public Health Laboratory Information System (PHLIS)

PHLIS is the public health laboratory-based, national surveillance system for infectious diseases. Reports of *Salmonella*, *Shigella*, *Campylobacter*, and Shiga toxin-producing *E. coli* isolates are transmitted electronically through PHLIS to CDC, with accompanying basic epidemiologic data and serotype data where appropriate. PHLIS is a national source of critical serotype information for these pathogens. PHLIS has been experiencing challenges during the past several years. Since 1998, updates of PHLIS software were frozen, and it remains a legacy DOS based system that is increasingly difficult to use. The number of participating states has dramatically decreased over the last 3 years and will continue to decline as states seek alternatives to PHLIS.

A replacement for the current system has been developed by CDC and is currently being implemented.

The new system will transfer the same surveillance data currently collected in PHLIS via the Public Health Information Network Messaging System (PHIN MS), which is a secure internet pipeline for data transmission to CDC. Each reporting site will be responsible for exporting current disease data to a delimited ascii file then transmit data to CDC using the PHINMS administrative tool. We hope that all reporting sites will transmit their data using this simplified system over the next several months.

Highlights for 2006

Human Sources

A total of 40,666 *Salmonella* isolates were reported from participating public health laboratories in 2006. All states and the District of Columbia reported isolates; Florida, Montana and the District of Columbia reported partial serotype information. The number of reported isolates represents a slight increase (4.2%) compared with 1996 and a large increase compared with 2005 (12.3%); this could be attributed to increased reports from several states, including Texas and California. The national rate of reported *Salmonella* isolates in 2006 was 13.6 per 100,000 based on 2006 census population figures for the United States.

Similar to other years, *Salmonella* was isolated most frequently from children under 5 years of age, accounting for 24% of isolates (Table 2). Fewer than 10% of isolates came from persons in each of the second through fifth decades of life, with lower proportions from persons in later decades of life. The distribution of isolates between the sexes was different, with a greater number of isolates from male than female infants and children and a smaller proportion of isolates from male than female adults (Table 2).

The twenty most common serotypes of *Salmonella* in 2006 are listed in Table 1a. These represent 70% of all *Salmonella* isolates. The four most common serotypes in 2006 (Typhimurium, Enteritidis, Newport, and Heidelberg; 45% of all isolates) have been the most common serotypes since 1995, except for 2004 when serotype Javiana replaced Heidelberg as the fourth most common serotype. (During 2004, a multistate outbreak of serotype Javiana infections associated with tomatoes at a gas station deli chain affected more than 400 people in 5 states.) *Salmonella* Typhimurium has been the most commonly isolated serotype since 1997, though Enteritidis was a very close second in 2005 and 2006 (Figure 3). The number of isolates of Typhimurium and Enteritidis have both declined substantially (28% and 30%, respectively) since 1996; the total number of *Salmonella* isolates has slightly increased during this same period (Table 1c).

Among the twenty most common serotypes in 2006, *Salmonella* Hadar has had the largest percent decline in rat4es of isolataion during the last 10 years. It was the eighth most common serotype in 1996 and declined to the 20th most common in 2006, a 58% decline. Serotype Enteritidis declined 30% since 1996, although most of the decline was between 1996 and 1998. *Salmonella* Mississippi has had the most dramatic increase, 236% since 1996, most since 2002. *Salmonella* Newport had a large increase in numbers between 1997 and 2002, but then declined and has remained relatively stable since 2004. Similarly, serotype Javiana had substantial increases in 2003 and 2004, but has declined 19% from the 2004 peak.

Among the more common serotypes, increases in serotypes Litchfield, Mbandaka, Montevideo, San Diego, Stanley, and Telekebir have also occurred. In the serotypes that averaged at least 10 isolates per year, Paratyphi A has increased since 1996 (112%); serotype Tennessee more than doubled in numbers from 2005 to 2006. Among the less common serotypes, the number of serotype Concord isolated increased. A total of 17 *Salmonella* Concord isolates were recorded in 2006, up from 0-5 per year from 1996-2005. Other interesting increases are among serotype IV 50:z4,z23:- which declined in 2001-2005 but increased to 64 in 2006; serotype Corvallis had 0-4 isolates each year from 1996-2004 but jumped to 13 and 23 isolates each year in 2005 and 2006, respectively. Serotype IIIb 50:r:z increased to 10 isolates in 2006, up from 0-3 isolates per year.

Salmonella Paratyphi B var. L (+) tartrate + (formerly serotype Java) appeared to have increased from 2003, but this change may be due to improved reporting. Paratyphi B var. L (+) tartrate + is closely related to serotype Paratyphi B; testing for tartrate fermintation is required to differentiate these two serotypes.

Salmonella serotype I 4,[5],12:i:- was ranked as the 18th most common serotype in 2002 and has increased in rank to 6th in 2006. The serotype has been tracked in the National Surveillance system since 1998, though many isolates were classified as only "Subspecies I" or "Group B" in the past. Since the *Salmonella* Surveillance Annual Summary for 2003 was published, we examined the 1995 to 2003 surveillance data and were able to reclassify some isolates submitted in these years as I 4,[5],12:i:- based on additional data submitted. Recent efforts to correctly classify this serotype may be responsible for at least some of the increase in numbers. It is unknown how many of the 528 isolates reported as Subspecies I, Group B in 2006 could be this serotype (Table 3a). Many U.S. isolates of this serotype were characterized by pulsed-field gel electrophoresis (PFGE) and the patterns submitted to PulseNet, the National Molecular Subtyping Network for Foodborne Disease Surveillance. The PFGE patterns for most serotype I 4,[5],12:i- isolates were closely related to serotype Typhimurium PFGE patterns, indicating that they are most likely variants of serotype Typhimurium.

A large proportion of serotype Typhimurium isolates were resistant to multiple antimicrobial drugs; in a national survey in 2004, 39% were resistant to one or more drugs and 23% had a five-drug resistance pattern characteristic of a single phage type, DT104 (1). Similarly, serotype Newport has emerged as a major multidrug-resistant pathogen. In 2004, 28 (15%) of 190 serotype Newport isolates submitted to the National Antimicrobial Resistance Monitoring System were resistant to at least seven of 17 antimicrobial agents tested, including extended-spectrum cephalosporins (1,2).

Similar to other years, there were marked regional differences in the frequency of *Salmonella* isolates among serotypes. The rate of isolations by region has been followed closely for serotype Enteritidis as a means of assessing the impact of egg safety regulations and industry improvements. As indicated in Figure 2, serotype Enteritidis rates of isolation had been relatively high in New England, Mid Atlantic and Pacific regions, but have shown significant decreases since 1995. However, since 2003 all regions have had small increases in serotype Enteritidis rates of isolation.

Outbreaks

There were 121 Salmonella outbreaks in 2006, causing greater than 3,300 illnesses reported to the CDC Foodborne Outbreak Reporting System. The most common outbreak serotypes were Enteriditis (26), Typhimurium (26), Newport (10), and Heidelberg (10) (3). In the past, the number of Enteriditis outbreaks identified greatly exceeded the number of Typhimurium outbreaks despite Tyhpimurium's tendency to outrank Enteriditis in number of sporadic cases. This is the first year that the number of Typhimurium outbreaks has come close to the number of Enteriditis outbreaks reported (3). *Salmonella* Tennessee was a notable outbreak associated with peanut butter, which was distributed worldwide, and caused over 700 cases in 48 states (4). In 2006, two *Salmonella* outbreaks were associated with consumption of raw tomatoes in restaurants. The first, caused by *Salmonella* Newport, caused 119 illnesses in 18 states; the Typhimurium tomato outbreak resulted in 190 cases across 21 states (5).

Non-human Sources

Data on *Salmonella* isolates obtained from non-human sources can help identify possible sources of human illness. *Salmonella* Typhimurium, the most common serotype in humans, is identified most commonly from clinical samples from bovine and equine sources, and from non-clinical samples from chicken sources. Serotypes Enteritidis and Heidelberg, the second and fourth most common serotypes in humans, respectively, are identified most commonly from clinical and non-clinical chicken sources (Table 6 and 7).

Adoption of the Kauffmann-White Scheme for designation of *Salmonella* serotypes

Salmonella serotyping has been the cornerstone for epidemiological surveillance and outbreak investigations for this important pathogen. The National *Salmonella* Surveillance system has tracked *Salmonella* isolates by serotype since 1968. New subtyping methods have come and gone, but

serotyping continues to provide essential subtype information for *Salmonella*. For example, PulseNet, the state-of-the-art genotyping system for *Salmonella*, relies on accurate serotype information as the "first-tier" subtype information. Pulsed field-gel electrophoresis (PFGE) pattern determination, by itself, does not replace serotyping, but rather subdivides within serotype.

The Kauffmann-White Scheme for designation of *Salmonella* serotypes is maintained by the WHO Collaborating Centre for Reference and Research on *Salmonella* at the Institut Pasteur and is used by most of the world. Up until 2002, CDC used a slightly different version, the "Modified Kauffmann-White Scheme". A unified format for serotype designation is essential for accurate surveillance via PulseNet, Global SalmSurv, and other international networks. Therefore, CDC adopted the Kauffmann-White Scheme on January 1, 2003.

The adoption of the Kauffmann-White Scheme affected only a few of the more common serotypes. The primary differences between the two schemes are:

i) *Salmonella* are divided into six subspecies that can be differentiated by biochemical and genetic tests. Under the Kauffmann-White Scheme, subspecies I serotypes are named; subspecies II through VI serotypes are identified by formula. The Modified Kauffmann-White Scheme used names for those subspecies II through VI serotypes that were designated through 1968 and formulas for those serotypes identified after 1968. With the adoption of the Kauffmann-White scheme, all named serotypes are subspecies I; serotypes from all other subspecies are designated by formula. In 2002, there were four named serotypes among the top 100 serotypes that did not belong to subspecies I and were affected by this change:

- *Salmonella* Marina is now designated as *Salmonella* IV 48:g,z51:-
- *Salmonella* Flint is now designated as *Salmonella* IV 50:z4,z23:-
- *Salmonella* Kralendyk is now designated as *Salmonella* IV 6,7:z4,z24:-
- *Salmonella* Chameleon is now designated as *Salmonella* IV 16:z4,z32:-

ii) Under the Kauffmann-White Scheme, serogroups E2 and E3 were combined with serogroup E1. This reflects the fact that the antigenic changes in serogroups E2 and E3 are the result of lysogenic conversion by bacteriophages and thus represent minor variants of serogroup E1 serotypes. The Modified Kauffmann-White Scheme used separate serotype names for these variants. Two serotypes in the top 100 in 2002 were affected by the merging of serogroups E2 and E3 with serogroup E1:

- *Salmonella* Newington is now *Salmonella* Anatum variety (var.) 15+
- *Salmonella* Newbrunswick is now *Salmonella* Give var. 15+

iii) Under the Kauffmann-White Scheme, two biotypes of *Salmonella* Paratyphi B are recognized; they are differentiated primarily by the ability to ferment L- tartrate. *S*erotype Paratyphi B is L- tartrate negative and is associated with more severe, typhoid fever-like disease. Serotype Paratyphi B var. L-tartrate + (also referred to as "Paratyphi var. Java") is L- tartrate positive and commonly associated with gastroenteritis. Serotype Paratyphi B var. L-tartrate + was known as "Java" in the Modified Kauffmann-White Scheme. The two biovars of Paratyphi B have been a source of confusion in the past because they have the same antigenic formula (I 4,[5],12:b:1,2), and are differentiated only by biotype. It is essential that the L- tartrate test be performed to accurately identify and report the two biotypes.

The *Salmonella* serotypes in this summary that were reported under different designations in 2002 and earlier United States surveillance data are listed on the next page.

Table I. Table of obsolete *Salmonella* serotype names and their current designations

Serotype	Obsolete name
Amager var. 15+	Tuebingen
Amsterdam var. 15+	Drypool
Anatum var. 15+	Newington
Anatum var. 15+, 34+	Minneapolis
Butantan var. 15+	Rosenthal
Cerro var. 14+	Siegburg
Choleraesuis var. Decatur	Decatur
Duisburg	Salinatis
Finkenwerder	Heves
Gallinarum	Pullorum
Give var. 15+	Newbrunswick
Give var. 15+, 34+	Menhaden
Lexington var. 15+	Manila
Lexington var. 15+, 34+	Illinois
Lille var. 14+	Bornum
Livingstone var. 14+	Eimsbuettel
London var. 15+	Portsmouth
Meleagridis var. 15+	Cambridge
Muenster var. 15+	Newhaw
Muenster var. 15+, 34+	Arkansas
Ohio var. 14+	Nienstedten
Oranienburg var. 14+	Thielallee
Orion var. 15+	Binza
Orion var. 15+, 34+	Thomasville
Oxford var. 15+, 34+	Khartoum
Paratyphi B var. L(+) tartrate+	Java
Rissen var. 14+	Ardwick
Typhimurium var. 5-	Typhimurium var. Copenhagen
Uganda var. 15+	Kinshasa
Vejle var. 15+	Goerlitz
Weltevreden var. 15+	Lanka
Westhampton var. 15+	Halmstad
II 4,12,[27]:b:[e,n,x]	Sofia
II 4,12,[27]:z:e,n,x	Nordenham
II 4,12:l,w:e,n,x	Kilwa
II 6,7:b:z42	Bloemfontein
II 6,7:l,z28:1,5:[z42]	Heilbron
II 6,7:z:1,5	Tosamanga
II 6,7:z39:1,5,7	Gilbert
II 9,12:d:e,n,x	Rhodesiense
II 9,12:g,m,[s],t:[1,5,7]:[z42]	Hamburg
II 9,12:g,m,s,t:e,n,x	Kuilsrivier
II 9,12:g,s,t:e,n,x	Neasden
II 9,12:l,w:e,n,x	Daressalaam
II 9,12:z39:1,7	Wynberg
II 9,46:g,[m],[s],t:[e,n,x]	Duivenhoks

Serotype	Obsolete name
II 11:g,[m],s,t:z39	Grabouw
II 11:m,t:e,n,x	Lincoln
II 13,22:g,m,t:[1,5]	Limbe
II 13,22:z29:1,5	Clifton
II 13,23:a:z42	Tygerberg
II 13,23:b:[1,5]:z42	Acres
II 13,23:g,m,[s],t:[e,n,x]	Luanshya
II 13,23:z:1,5	Nachshonim
II 17:g,t:-	Bleadon
II 21:z10:[z6]	Wandsbek
II 35:z29:e,n,x	Utbremen
II 40:c:e,n,x,z15	Suarez
II 40:z4,z24:z39	Degania
II 41:z10:z6	Lichtenberg
II 42:b:e,n,x,z15	Uphill
II 43:b:-	Kommetje
II 47:b:1,5	Phoenix
II 47:b:e,n,x,z15	Khami
II 47:d:z39	Quimbamba
II 48:d:1,2	Etosha
II 48:d:z6	Hagenbeck
II 48:g,m,t:-	Erlangen
II 48:k:z39	Sakaraha
II 60:g,m,t:z6	Setubal
IIIa 18:z4,z32:-	Shomron
IIIa 40:g,z51:-	Maartensdijk
IIIb 48:i:z	Sydney
IIIb 61:i:z	Eilbeck
IV 6,7:z4,z23:-	Roterberg
IV 6,7:z4,z24:-	Kralendyk
IV 11:z4,z23:-	Parera
IV 16:z4,z23:-	Ochsenzoll
IV 16:z4,z32:-	Chameleon
IV 21:z4,z23:-	Soesterberg
IV 40:z4,z32:-	Bern
IV 43:z36,z38:-	Volksdorf
IV 43:z4,z23:-	Houten
IV 43:z4,z32:-	Tuindorp
IV 44:z4,z32:-	Lohbruegge
IV 48:g,z51:-	Marina
IV 50:g,z51:-	Wassenaar
IV 50:z4,z23:-	Flint
IV 50:z4,z32:-	Bonaire
IV 51:z4,z23:-	Harmelen
S. bongori ser. 48:z35:-	Bongor

Overview of *Salmonella* Serotype Designation

1) *Salmonella* Taxonomy

The genus *Salmonella* is divided into two species, Salmonella enterica and Salmonella bongori.

Salmonella enterica is further subdivided into six subspecies that are designated by names or Roman numerals. The subspecies names are the taxonomically correct designations, but the Roman numeral designations are simpler and more commonly used for serotype designation. Subspecies IIIa and IIIb were historically considered a separate genus, *Arizonae*, and are still sometimes referred to by this name though it is obsolete. Despite their common history, subspecies IIIb is more closely related to the other *Salmonella* subspecies than to subspecies IIIa, so the two should be considered distinct entities.

Salmonella enterica subspecies	
I	*Salmonella enterica* subsp. *enterica*
II	*Salmonella enterica* subsp. *salamae*
IIIa	*Salmonella enterica* subsp. *arizonae*
IIIb	*Salmonella enterica* subsp. *diarizonae*
IV	*Salmonella enterica* subsp. *houtenae*
VI	*Salmonella enterica* subsp. *indica*

Salmonella bongori was originally designated *S. enterica* subspecies V; it has since been determined to be a separate species of Salmonella. However, for simplicity and convenience, these strains are sometimes referred to as "subspecies V" for the purpose of serotype designation.

2) *Salmonella* Serotypes

Salmonella serotyping is a subtyping method that has proven invaluable in differentiating isolates of the two species of *Salmonella*, particularly for public health purposes such as surveillance and outbreak investigations. *Salmonella* serotypes are based on the immunoreactivity of two surface structures, O antigen and H antigen. A substantial amount of diversity exists in these two antigens, resulting in the designation of more than 2,500 different serotypes to date and the recognition of new serotypes with regular frequency.

A point that has caused considerable confusion in *Salmonella* nomenclature is the fact that serotypes of *Salmonella* were historically considered different species (e.g., *Salmonella enterica* serotype Typhimurium was originally designated *Salmonella typhimurium*). It is now known that different serotypes of *Salmonella* can be (and often are) closely related both phenotypically and genetically. Despite this relatedness, serotyping continues to provide invaluable epidemiologic and public health surveillance data. In utilizing *Salmonella* serotype data, it is important to keep in mind that serotypes are subtypes. Serotype information is typically useful for understanding epidemiologic questions or in conveying information regarding specific pathogenic clones of *Salmonella* (e.g., *Salmonella* serotype Typhi); but, serotypes are not intended to be taxonomic designations.

3) *Salmonella* Serotype Antigens

O antigen is a carbohydrate antigen (also called a polysaccharide) that is the outermost component of LPS (lipopolysaccharide). It is a polymer of O subunits; each O subunit is typically composed of four to six sugars depending on the O antigen. Variation in O antigen results from variation in the sugar components of the O subunit, from variation in the nature of the covalent bond between the sugars of the subunit, and from variation in the nature of the linkage between the O subunits that form the O antigen polymer.

O antigens are designated by numbers and are divided into O serogroups or O groups. O groups are designated by the primary O factor(s) that are associated with the group. Many of the common O groups were originally designated by letter and are still commonly referred to by letter (e.g., serotype Typhimurium belongs to Group O:4 or Group B, serotype Enteritidis belongs to group O:9 or Group D1; serotype Paratyphi A belongs to Group O:2 or Group A).

Additional O factors are associated with some O groups and are often variably present or variably expressed. Table II lists the O groups and the additional O antigens that may be present in serotypes of that group. When multiple O factors are present, they are listed sequentially and separated by commas.

H antigen is the filamentous portion of the bacterial flagella; it is made up of protein subunits called flagellin. The C' and N' termini of flagellin are conserved and give the flagella its characteristic filament structure. The antigenically variable portion of flagellin is the middle region, which is surface-exposed. Salmonella is unique among enteric bacteria in that it can express two different flagellin antigens. Typically, this is coordinated so that only one antigen is expressed at time in a single bacterial cell. The two antigens are referred as Phase 1 and Phase 2. "Monophasic" isolates are those that express only a single flagellin type. These can occur naturally for some serotypes (e.g., serotypes Enteritidis, Typhi, and most subspecies IIIa and IV serotypes are monophasic), or can occur through the inactivation of a flagellin gene.

Table III lists the H antigens of *Salmonella*. Some antigens are composed of multiple factors, which are separated by commas; for example, the second phase antigen of serotype Typhimurium is composed of factors 1 and 2, which is represented as "1,2". Related antigens are grouped into complexes.

4) ***Salmonella*** **Serotype Identification**

Salmonella serotypes are typically identified in a cascade of tests. First, an isolate is identified and the subspecies is determined, typically by biochemical testing. O antigens and H antigens are detected in independent agglutination assays using antisera that react with groups of related antigens or a single antigen. Both H antigens can sometimes be detected in a single culture, particularly for older strains or for isolates that have been passed multiple times. When only one H antigen is detected, the isolate is inoculated onto phase reversal media, a semisolid media containing antisera to the H antigen that has already been identified. Organisms expressing the previously detected H antigen are immobilized by the added antisera and grow only near the point of inoculation. Organisms expressing the second H antigen are able to move away from the point of inoculation, evidenced by growth throughout the media. The second H antigen is then determined using growth from the phase reversal media.

5) ***Salmonella*** **Serotype Designation**

Salmonella serotypes are designated according to the conventions of the Kauffmann-White Scheme (Popoff 2001). All *Salmonella* serotypes can be designated by a formula. Additionally, subspecies I serotypes are given a name (e.g., Typhimurium, Enteritidis, Typhi). Before 1968, all serotypes were given names; as a result, some serotypes of subspecies II and IV were originally given names. Some of the obsolete names can still be found in the literature (e.g., Salmonella IV 48:g,z51:- was formerly known as Salmonella Marina); but, subspecies II through VI serotype should be designated by formula only.

The typical format for a serotype formula is:

Subspecies [space] O antigens [colon] Phase 1 H antigen [colon] Phase 2 H antigen

Examples:
I 4,5,12:i:1,2 (S. enterica serotype Typhimurium or *Salmonella* Typhimurium)
I 4,12:i:1,2 (S. enterica serotype Typhimurium var. 5- or Salmonella Typhimurium var. 5-)
I 9,12:g,m:- (S. enterica serotype Enteritidis or *Salmonella* Enteritidis)
II 47:b:1,5 (S. enterica serotype II 47:b:1,5 or *Salmonella* II 47:b:1,5)
IV 48:g,z51:- (S. enterica serotype IV 48:g,z51:- or *Salmonella IV 48:g,z51:-)*
IIIb 65:(k):z (S. enterica serotype IIIb 65:(k):z or Salmonella IIIb 65:(k):z)

Other conventions:

- Some O and H factors are variably present. This is indicated in the generic serotype formula by underline when the variable factor is known to be encoded on a bacteriophage (e.g., O factor 1; only described for O antigens) or by square brackets (e.g., O factor [5] or H antigen [1,2]) when it is not. For an individual isolate, if the variable factor is detected it is included in the formula without additional notation. If the variable factor is not detected, it is not listed in the formula.

- Some O and H factors are variably expressed. Weakly recognized antigens are indicated by parentheses; e.g., O antigen (6),14 or H antigen (k).

- In monophasic isolates, the absence of an H antigen is indicated by a minus sign ("-") for the particular phase.

- Variants of serotypes that do not express all the recognized antigens characteristic of a particular serotype are not uncommon. This is a particular issue for subspecies I serotypes because a serotype name cannot be assigned unless all the antigens specified in the Kauffmann-White scheme for that serotype are identified. Isolates missing one or more antigens are designated by a formula. For example:

    i. Monophasic variants are variants of typically diphasic serotypes that lack the expression of either the flagellar Phase 1 or Phase 2 antigen; these are indicated by a minus sign ("-") in place of the missing phase; e.g., monophasic variants of serotype Typhimurium that lack the second phase H antigen 1,2 are designated as *Salmonella* serotype I 4,5,12:i:- or I 4,12:i:-; monophasic variants of Salmonella Typhimurium that lack the first phase H antigen i are designated as serotypes I 4,5,12:-:1,2 or I 4,12:-:1,2.

    ii. Nonmotile variants express no H antigens and are indicated by minus signs in both phases or by "nonmotile" in place of the H antigens; e;g., I 4,5,12:nonmotile or I 4,5,12:-:-.

    iii. Rough variants are isolates that do not express O antigen. This is indicated by "Rough" in place of the O antigen in the antigenic formula; e.g., I Rough:i:1,2.

    iv. Mucoid variants express a capsule that prevents immunologic detection of the O antigen. They are indicated by "Mucoid" in place of the O antigen in the antigenic formula; e.g., I Mucoid: i:1,2.

- Rarely, isolates express a third H antigen that is noted by a colon followed by the antigen after the Phase 2 H antigen (e.g., Salmonella serotype II 9,12:g,m,[s],t:1,5,7:z42)

6) ***Salmonella*** **Serotype Statistics**

There were 2541 described *Salmonella* serotypes as of 2007; approximately 60% belong to subspecies I. In the US, approximately 99% of *Salmonella* isolates from humans that are reported belong to subspecies I. The "top 10" most common serotypes from human specimens account for approximately 70% of all isolates reported in the US; the "top 100" serotypes account for about 98% of all isolates. Four subspecies IV serotypes are commonly found among the top 100 serotypes: IV 48:g,z51:-; IV 50:z4,z23:-; IV 6,7:z4,z24:-; and IV 16:z4,z32:-. Among the non-subspecies I isolates, subspecies IV isolates are the most common, followed by subspecies IIIb, II, and IIIa. Subspecies VI and S. bongori isolates are very rare.

Table II. Salmonella O serogroups and associated O antigens

O Group (number designation)	O Group (letter designation)	Antigens present in all serotypes	Additional antigens that may be present in some serotypes
2	A	2,12	1
4	B	4,12	1; 5; 27
7	C1	6,7	14; (Vi)
8	C2	8	6; 20
9	D1	9,12	1; (Vi)
9,46	D2	9,46	none
9,46,27	D3	9,12,46,27	1
3,10	E1	3,10	15; 15,34
1,3,19	E4	1,3,19	10; 15
11	F	11	none
13	G	13	1; 22; 23
6,14	H	6,14	1; 24; 25
16	I	16	none
17	J	17	none
18	K	18	6; 14
21	L	21	none
28	M	28	none
30	N	30	none
35	O	35	none
38	P	38	none
39	Q	39	none
40	R	40	1
41	S	41	none
42	T	42	1
43	U	43	none
44	V	44	1
45	W	45	none
47	X	47	1
48	Y	48	none
50	Z	50	none
51		51	1
52		52	none
53		53	1
54 (provisional)		54	21; 3; 3,15; 4,12; 8,20; 6,7
55		55	none
56		56	none
57		57	none
58		58	none
59		59	1
60		60	none
61		61	none
62		62	none
63		63	none
65		65	none
66		66	none
67		67	none

Table III. H (flagellar) antigens of *Salmonella*

1 complex:	1,2	Other antigens (not part of a complex):	A
	1,5		B
	1,6		C
	1,7		D
	1,2,5		e,h
	1,2,7		I
	1,5,7		K
	1,6,7		(k)
EN complex:	e,n,x		R
	e,n,x,z15		r,i
	e,n,z15		Y
G complex:	f,g		Z
	f,g,m,t		z6
	f,g,s		z10
	f,g,t		z29
	g,m		z35
	g,m,p,s		z36
	g,m,q		z36,z38
	g,m,s		z38
	g,m,s,t		z39
	g,m,t		z41
	g,p		z42
	g,p,s		z44
	g,p,u		z47
	g,q		z50
	g,s,q		z52
	g,s,t		z53
	g,t		z54
	g,z51		z55
	g,z62		z56
	g,z63		z57
	g,z85		z60
	m,p,t,u		z61
	m,t		z64
L complex:	l,v		z65
	l,w		z67
	l,z13		z68
	l,z13,z28		z69
	l,z28		z71
Z4 complex:	z4,z23		z81
	z4,z23,z32		z83
	z4,z24		z87
	z4,z32		z88

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These websites contain an excellent of the history and current status of *Salmonella* taxonomy and nomenclature:

http://www.bacterio.cict.fr/salmonellanom.html
http://www.bacterio.cict.fr/s/salmonella.html

TABLE 1

The 20 most frequently reported Salmonella serotypes from human sources reported to CDC in 2006

Human 2006			
Rank	**Serotype**	**Reported**	**Percent**
1	Typhimurium *	6872	16.9
2	Enteritidis	6740	16.6
3	Newport	3373	8.3
4	Heidelberg	1495	3.7
5	Javiana	1433	3.5
6	I 4,[5],12:i:-	1200	3.0
7	Montevideo	1061	2.6
8	Muenchen	753	1.9
9	Oranienburg	719	1.8
10	Mississippi	604	1.5
11	Saintpaul	588	1.4
12	Braenderup	561	1.4
13	Agona	538	1.3
14	Infantis	491	1.2
15	Thompson	447	1.1
16	Paratyphi B var. L(+) tartrate+	417	1.0
17	Typhi	413	1.0
18	Stanley	315	0.8
19	Tennessee	312	0.8
20	Hadar	275	0.7
	Sub Total	**28607**	**70.3**
	All Other Serotyped	6459	15.9
	Unknown	4042	9.9
	Partially serotyped	1448	3.6
	Rough, mucoid, and/or nonmotile isolates	110	0.3
	Sub Total	**12059**	**29.7**
	Total	**40666**	**100**

NOTE:
---
* Typhimurium includes var. 5- (Formerly var. Copenhagen)

TABLE 1a

The 20 most frequently reported Salmonella serotypes from clinical and non-clinical nonhuman sources reported to CDC and NVSL in 2006

Clinical Nonhuman 2006			
Rank	**Serotype**	**Reported**	**Percent**
1	Typhimurium *	1592	19.9
2	Newport	648	8.1
3	Agona	455	5.7
4	Orion var. 15+,34+	365	4.6
5	Dublin	358	4.5
6	Montevideo	356	4.4
7	Anatum	315	3.9
8	Derby	302	3.8
9	Heidelberg	264	3.3
10	Senftenberg	232	2.9
11	Kentucky	213	2.7
12	Muenster	189	2.4
13	Mbandaka	172	2.1
14	I 4,5,12:i:-	160	2.0
15	Cerro	159	2.0
16	Infantis	159	2.0
17	Choleraesuis **	157	2.0
18	Reading	104	1.3
19	Meleagridis	98	1.2
20	Uganda	82	1.0
	Sub Total	**6380**	**79.6**
	All Other Serotyped	1635	20.4
	Sub Total	**1635**	**20.4**
	Total	**8015**	**100**

NOTE:
---
* Typhimurium includes var. 5- (Formerly var. Copenhagen)
** Choleraesuis includes var. Decatur and Kunzendorf

Non-Clinical Nonhuman 2006			
Rank	**Serotype**	**Reported**	**Percent**
1	Heidelberg	774	11.5
2	Kentucky	732	10.9
3	Typhimurium *	695	10.4
4	Senftenberg	555	8.3
5	Hadar	438	6.5
6	Cerro	239	3.6
7	Enteritidis	222	3.3
8	Agona	204	3.0
9	Anatum	179	2.7
10	Montevideo	160	2.4
11	Newport	158	2.4
12	Mbandaka	137	2.0
13	Derby	129	1.9
14	Schwarzengrund	122	1.8
15	Oranienburg	120	1.8
16	I 4,5,12:i:-	118	1.8
17	Give	106	1.6
18	Worthington	105	1.6
19	Muenchen	95	1.4
20	Saintpaul	93	1.4
	Sub Total	**5381**	**80.2**
	All Other Serotyped	1329	19.8
	Sub Total	**1329**	**19.8**
	Total	**6710**	**100**

NOTE:
---
* Typhimurium includes var. 5- (Formerly var. Copenhagen)

TABLE 1b

The 20 most frequently reported Salmonella serotypes from human sources
Percent change in reported isolates

Rank				Reported Isolates			Percent Change		
1996	2001	2006	Serotype	1996	2001	2006	1996-2001	2001-2006	1996-2006
2	1	1	Typhimurium *	9500	7040	6872	-26	-2	-28
1	2	2	Enteritidis	9570	5634	6740	-41	20	-30
4	3	3	Newport	1985	3168	3373	60	6	70
3	4	4	Heidelberg	1998	1895	1495	-5	-21	-25
6	5	5	Javiana	749	1068	1433	43	34	91
35	20	6	I 4,[5],12:i:-	96	260	1200	171	362	1150
5	6	7	Montevideo	1227	630	1061	-49	68	-14
10	8	8	Muenchen	595	586	753	-2	28	27
7	7	9	Oranienburg	690	598	719	-13	20	4
24	16	10	Mississippi	180	336	604	87	80	236
12	10	11	Saintpaul	562	471	588	-16	25	5
13	13	12	Braenderup	531	396	561	-25	42	6
9	14	13	Agona	606	372	538	-39	45	-11
14	12	14	Infantis	503	441	491	-12	11	-2
11	9	15	Thompson	586	514	447	-12	-13	-24
18	11	16	Paratyphi B var. L(+) tartrate+	289	467	417	62	-11	44
15	15	17	Typhi	440	344	413	-22	20	-6
22	24	18	Stanley	200	173	315	-14	82	58
37	61	19	Tennessee	96	33	312	-66	845	225
8	19	20	Hadar	658	307	275	-53	-10	-58

NOTE:
---
* Typhimurium includes var. 5- (Formerly var. Copenhagen)

TABLE 2

Salmonella isolates from human sources by age group and sex, 2006

	Sex			
Age Group	**Female**	**Male**	**Unknown**	**Total**
< 1 Year	1548	1815	219	3582
1 to 4	2902	3147	285	6334
5 to 9	1389	1577	122	3088
10 to 19	1659	1892	134	3685
20 to 29	1898	1692	153	3743
30 to 39	1632	1431	122	3185
40 to 49	1914	1437	136	3487
50 to 59	1740	1259	109	3108
60 to 69	1295	909	90	2294
70 to 79	980	690	51	1721
80+	853	399	58	1310
Unknown Age	1089	1021	3019	5129
	18899	**17269**	**4498**	**40666**

FIGURE 1

Salmonella Isolates from human sources by age group and sex, 2006

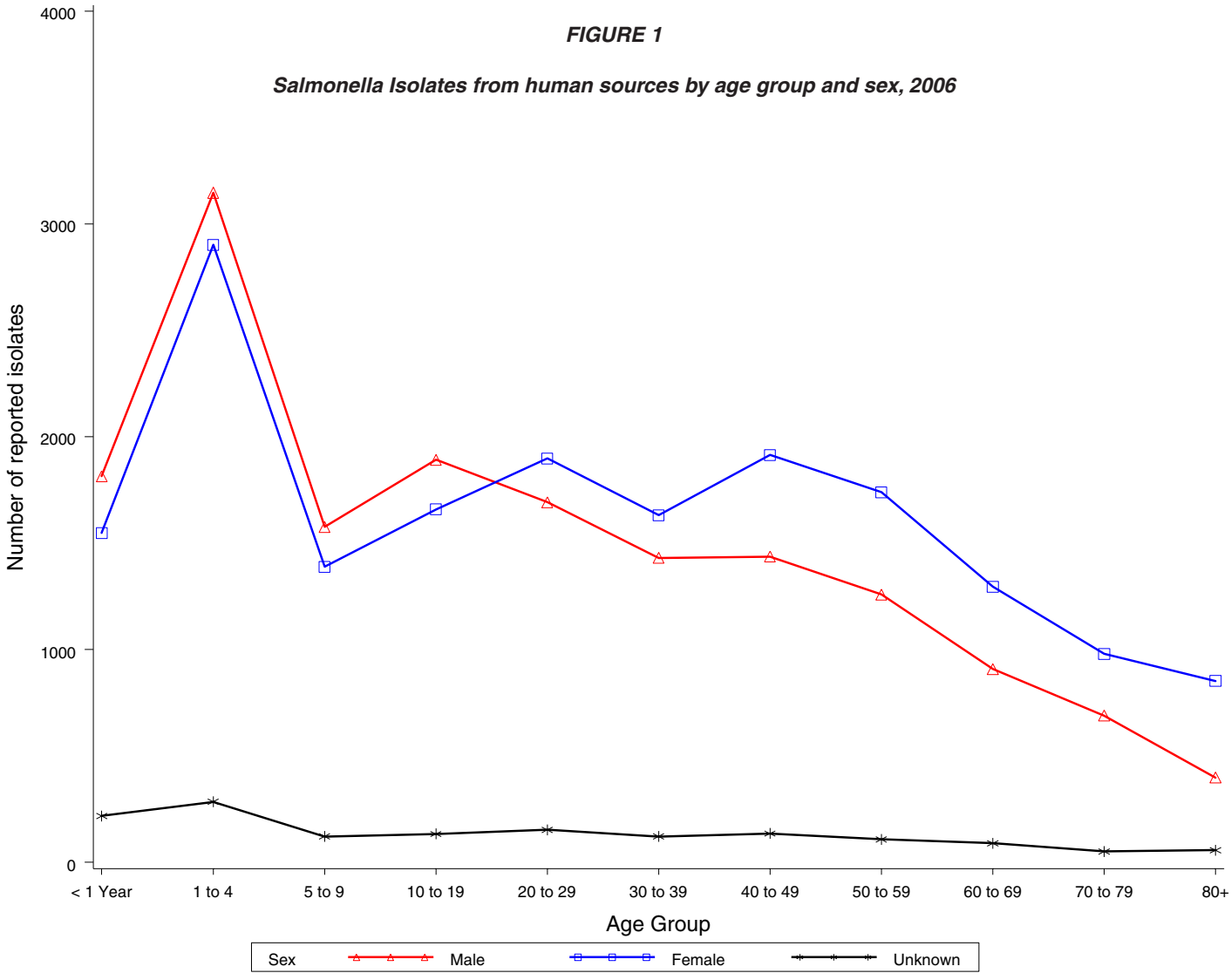

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Aarhus	6	16	9	6	7	2	7	9	3	5	6	76
Aba					4			1			1	6
Abadina							2					2
Abaetetuba	17	8	7	7	5	4	3	1	1		3	56
Aberdeen	2	3	4	4	13	5	3	3	6	6	10	59
Abony	2	3	6	4	1	11	9	9	10	2	8	65
Abortusequi		1										1
Adelaide	88	70	73	95	42	81	66	60	76	71	70	792
Adime								1				1
Aequatoria		1		1					5	2		9
Aflao	1			1								2
Africana			2	6					1			9
Afula									1			1
Agama	2	2	2	2	1	1	5	4	2	8	4	33
Agbeni	1	3		1	13	5	4	7	72	15	15	136
Agege	1											1
Ago		1	1		1						1	4
Agodi							1					1
Agona	606	740	991	528	406	372	340	523	407	369	538	5820
Agoueve	4	3	6	2	2	3	6	2	2	3	3	36
Ahuza	1				2							3
Ajiobo		2	2		2		2	1	1		1	11
Alabama	2	2	2	4	1	1	3		3	3	5	26
Alachua	39	18	14	22	20	9	16	10	28	21	18	215
Alagbon									1	3		4
Alamo			1									1
Albany	26	21	23	17	18	17	15	17	34	38	36	262
Albert	1									1		2
Albuquerque							1					1
Allandale			1		1	1			1			4
Allerton									1			1
Altona	1	1		1	4	3	3		2	1	4	20
Amager	1	8	3	4	7	1	2	3	15	5	4	53
Amager var. 15+									3			3
Amherstiana											1	1
Amoutive											1	1
Amsterdam	2	9	5	6	2	5	7	6	3	2	3	50
Amsterdam var. 15+	5	7	4	5	1	5	3		1	2	1	34
Anatum	271	208	138	157	177	188	217	177	250	197	238	2218
Anatum var. 15+	16	20	25	23	8	4	4	10	11	6	16	143
Anatum var. 15+, 34+	1						1					2
Anecho	5	2	2	2	1		5	2		2	3	24
Anfo										1	1	2
Ank	2											2
Annedal	1					1						2

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Antsalova	1		2		3		1		1			8
Apapa		2		2	4	8	10	3	12	7	7	55
Apeyeme				1	1				1	2		5
Aqua	2	1			2	1		1	2	2	3	14
Aragua	1	1	1		1							4
Arapahoe							1					1
Arechavaleta	6	9	4	3	9	3	6	3	14	4	2	63
Assen				1	1		1			1		4
Assinie											4	4
Athinai			1									1
Ati									2			2
Augustenborg		2				1				1		4
Austin						1						1
Australia						3						3
Avignon											1	1
Avonmouth							1					1
Azteca				1						1		2
Babelsberg					1				2			3
Baguirmi						1						1
Bahati	1											1
Bahrenfeld		1									1	2
Baildon	5	5	73	77	4	2	14	12	7	33	14	246
Ball	2					1						3
Banalia						1						1
Banana	1	1	1		1	1		3		2	1	11
Banco			2									2
Bandia									1			1
Bardo	28	10	10	13	20	16	49	42	32	27	29	276
Bareilly	115	112	153	171	182	206	183	240	232	201	256	2051
Bargny											1	1
Barranquilla	1			1		3	1	3	3	1	5	18
Bassa								1				1
Bassadji						1			1			2
Beaudesert					1			1			3	5
Belem				1				1				2
Benfica	1		1	1		1						4
Benin	1									1	6	8
Bere	2	8	1			1		1		2	7	22
Bergen				1	2			1			1	5
Berkeley			1									1
Berta	118	87	123	143	312	334	300	201	409	209	252	2488
Bijlmer										2		2
Binningen									1			1
Birkenhead	2	7	4		2	2		4	5	2		28
Bispebjerg	1	1						1				3

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Blegdam	2	4	3	1	2	2	3	2	8	4		31
Blijdorp	1							1				2
Blockley	51	62	61	54	28	33	38	67	83	50	61	588
Blukwa	1	1										2
Bobo										1		1
Bochum			5	1		3		1				10
Bolton					1							1
Bonames					1			1				2
Bonariensis	3	3	6	4	3	6	6	4	3	1	2	41
Bonn	1		1		1	2			2		1	8
Borbeck					1							1
Bournemouth							1	2	1	2	1	7
Bousso			1							3	1	5
Bovismorbificans	41	47	64	35	55	83	74	69	110	73	71	722
Bracknell							1					1
Bradford	1	3	1		2	1	2	3	1		1	15
Braenderup	531	559	497	529	531	396	389	553	684	603	561	5833
Brancaster			1					1				2
Brandenburg	181	168	132	117	84	106	140	116	80	134	94	1352
Brazil	1	1		2				2	2	2	3	13
Brazos		1		1								2
Brazzaville								1		2	3	6
Bredeney	47	51	112	44	25	79	41	56	27	26	27	535
Brezany						4	2	1		1		8
Brikama	1											1
Bristol		1										1
Bron	1					1			3		1	6
Bronx		2	2			1						5
Brooklyn			1					1				2
Broughton				1								1
Brunei									3	2		5
Bsilla						1	1		3	1		6
Bukavu		1			1			1				3
Bukuru									1			1
Butantan				1			1			1		3
Butantan var. 15+					1							1
Buzu		5	4	1				1			2	13
Calabar			1	1								2
California	1	9	3	1		1		5	1		2	23
Camberwell			1									1
Canada	1				1		1	1	1	1		6
Cannstatt		1	1		1	1	3	1			1	9
Caracas		3		1			1				1	6
Carmel	1			1	1	8	9		9	4	1	34
Carno				1								1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Carrau	30	6	3	12	6	5	3	7	8	9	10	99
Cerro	55	60	52	56	52	31	39	28	19	22	33	447
Cerro var. 14+								3	3	4	2	12
Ceyco						1	1					2
Chailey	4	12	9	3	3		1	1	3	2		38
Chandans							3		1	5	1	10
Charity					1							1
Charlottenburg	1											1
Chester	26	36	24	29	23	24	23	51	15	15	29	295
Chicago			1				1	1			1	4
Chichiri						1		1				2
Chincol			1	2	2			1		2	1	9
Chingola		1				1						2
Chittagong										7		7
Choleraesuis	41	25	23	25	10	8	11	13	17	7	12	192
Choleraesuis var. Decatur			2			1	3		1			7
Choleraesuis var. Kunzendorf	26	24	13	9	10	5	8	6	9	6	11	127
Clackamas	1	3		3	1		6	4	1	1	1	21
Claibornei			1	1		1			1		1	5
Clerkenwell						1						1
Cleveland									1			1
Cochise					1							1
Coeln	7	4	5	2	3	3	3	2	3	2	4	38
Colindale	7	1	4	2	3	2	5	8	3	4	13	52
Colorado	1	1	2	2				1				7
Concord	5	2	2	3		2	1	3	4	6	17	45
Corvallis	1	1	1	1	1		1	3	4	13	23	49
Cotham				2	1		3	6	5	9	12	38
Cremieu		1			2	1				1		5
Croft											1	1
Cubana	34	36	72	42	31	26	21	24	18	13	17	334
Cuckmere									1		1	2
Cullingworth	1				1					6		8
Curacao				1	2	1				1		5
Daarle									1	1		2
Dahlem											1	1
Dahomey								1				1
Dahra				2	1	1	1	1		2	2	10
Damman									1			1
Daytona	4	6	3	4	3	4	4	10	10	5	5	58
Denver	2	3	1	1	1	1	2	5	1	5	1	23
Derby	143	152	171	174	188	121	169	125	137	123	139	1642
Derkle					1							1
Dessau		1				1						2
Diguel	4	2	1				2	1		1		11

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Diourbel					1					1		2
Djakarta											1	1
Djelfa				1								1
Djugu	2	2	1	1	1				2	1	2	12
Doel	2											2
Doncaster								1				1
Doorn											1	1
Doulassame		1	1							1		3
Dublin	85	61	78	66	94	76	83	65	73	55	88	824
Duesseldorf	6	6	15	5	1	2		8	9	1		53
Dugbe					1							1
Duisburg	3			1	1	2	2	2			1	12
Dunkwa						1						1
Durban	8	8	10	3	4	5	1	3	16	6	11	75
Durham	4	2		1	3	3	4	4	3	8	4	36
Duval		1	1				1		1		1	5
Ealing	26	8	6	6	9	16	10	12	13	27	12	145
Eastbourne	13	3	8	7	10	6	18	18	8	30	16	137
Ebrie				1	3	2	1	1				8
Echa								1		1		2
Edinburg			1	6	2	1	5	20	27	20	17	99
Edmonton										1		1
Ekpoui					1		1					2
Elisabethville									1			1
Elokate								1				1
Elomrane				3	1	1	1	1	3			10
Emek	5	7	7	8	5	2	2	11	6	7	3	63
Entebbe	8	4		1				1	1		3	18
Enteritidis	9570	7924	6030	5343	6487	5634	5145	4914	5028	6732	6740	69547
Enugu	1	1										2
Epicrates							1					1
Eppendorf				2	2				1		2	7
Escanaba		3					1					4
Eschweiler										1		1
Essen	2	3	2	3	4	1		1	2	1	1	20
Etterbeek		1										1
Falkensee		1						1		4		6
Fallowfield		3										3
Fann							1			1		2
Farmsen	2	6	4	3		1	1	1	1	1		20
Farsta							4		1		1	6
Fayed				6	3	4		1		1	1	16
Ferruch								1				1
Fillmore							1					1
Finkenwerder				1								1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Fischerkietz			1	1							1	3
Fischerstrasse					1		1					2
Fitzroy									1			1
Florida	7	11	8	1	2	4	2	3	1	6	3	48
Fluntern	1		3			2	2	5	8	3	3	27
Fomeco										1		1
Freetown						1		6	2	11		20
Freiburg								1				1
Fresno						3	1					4
Friedenau		1					1	1			1	4
Friedrichsfelde									2	1	1	4
Frintrop	1										1	2
Fulica		1								1		2
Fyris	2		1							1	2	6
Gabon			1	1			1					3
Galiema								1	1			2
Galil		1				2						3
Gallinarum	2	1	1	1		1	3	2		2		13
Gamaba			1									1
Gambia		2								1		3
Gaminara	44	47	61	52	51	58	44	86	134	99	77	753
Garba	1					1						2
Garoli											1	1
Gatow			2		1	1	1			2		7
Gatuni	2		1	1	1	3		2	3	1	2	16
Georgia			2			4	3	2	2	1	6	20
Gera								1				1
Give	114	118	92	98	86	75	55	93	102	103	123	1059
Give var. 15+	22	26	36	23	9	9	5	7	5		1	143
Give var. 15+, 34+	14	1					1					16
Glasgow						1						1
Glidji	1											1
Glostrup	13	5	10	7	6	6	2	2	2	10	5	68
Gloucester	2	2										4
Gnesta									1			1
Godesberg	1											1
Goeteborg		1										1
Goettingen		1	1	1	3		2	1	2			11
Goldcoast		1	1	1					1	2		6
Goma								1				1
Gombe									1			1
Grandhaven											1	1
Groenekan						1						1
Grumpensis			1	2	1	1		1		102	9	117
Guildford				1								1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Guinea	1								1	3	1	6
Gustavia					1	1						2
Gwale											1	1
Haardt	6	5	2	3	4	4	3	52	29	4	5	117
Hadar	658	643	544	516	354	307	333	280	277	205	275	4392
Hadejia				1								1
Haifa	3	4	3	6	11	4	6	3	5	5	5	55
Halle				1								1
Handen	1											1
Hannover									1			1
Harburg		1					1	1			1	4
Harcourt											1	1
Harleystreet			1									1
Harrisonburg									1			1
Hartford	89	110	175	140	150	158	198	188	190	239	199	1836
Hatfield		1		1				1				3
Hato				1	2	5	1	1	2		4	16
Havana	59	47	77	46	26	19	28	29	32	26	37	426
Hayindogo			1			1	1					3
Heidelberg	1998	2104	1900	1816	1772	1895	1985	1845	1758	1905	1495	20473
Hemingford									1			1
Heron		1										1
Herston						1	1	2	2	2	2	10
Hessarek								1				1
Hidalgo		1							1			2
Hiduddify			3	1	1		1	2			1	9
Hillegersberg							1	1			1	3
Hillingdon	1									1		2
Hindmarsh	1	1	3		3	4	2	5	12	5	5	41
Hofit										1	2	3
Hoghton									1		1	2
Holcomb	1	2		1		3	4	1		2	3	17
Homosassa	1		2									3
Horsham	2			3				1			1	7
Hull						1	1	2		3	3	10
Hvittingfoss	44	26	29	38	34	30	44	32	34	36	45	392
Ibadan	33	42	39	27	17	9	10	17	5	9	3	211
Idikan	11	4	1		2		1	1		1		21
Ilala		1							1			2
Ilugun	3											3
Imo	1											1
Inchpark				1								1
India	1											1
Indiana	28	11	7	14	9	13	24	43	18	17	28	212
Infantis	503	651	600	596	613	441	472	570	588	506	491	6031

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Inganda					1	4		2	1		1	9
Inpraw								1				1
Inverness	20	26	32	24	22	24	30	30	49	44	49	350
Ipswich	1			1								2
Irenea				1				1				2
Irumu	18	13	15	6	6	9	2	9	13	9	9	109
Isangi	1	1	5	2		3	1	4	3	4	1	25
Israel								2	1		1	4
Istanbul	9	8	7	25	15	27	33	15	61	9	8	217
Isuge							1					1
Itami	1	2	8	7	12	50	3	8	7	10	1	109
Ituri	2	1	5	3	2	7	1		1	1	1	24
Jamaica		2	1	2								5
Jangwani	7	4	5	6	7	2	3		4	4		42
Javiana	749	675	1168	1197	1204	1068	1201	1718	1776	1324	1433	13513
Jedburgh		1								1		2
Jericho										1		1
Jerusalem						1	1	1			1	4
Joal	1						2	2	4			9
Jodhpur			1				1		1			3
Johannesburg	45	45	32	44	31	35	20	17	40	44	22	375
Jos				1						2		3
Jubilee		1							1		1	3
Jukestown											1	1
Kaapstad	1				1	1		2	1			6
Kaduna										1		1
Kalamu						1					1	2
Kalina						1				1		2
Kallo											1	1
Kambole			1					1				2
Kande						1	3					4
Kandla							1					1
Kanifing		1										1
Kaolack	1											1
Kapemba									1		1	2
Kedougou			1	2	3	1	1		3	4	4	19
Kentucky	78	60	58	71	48	64	69	59	56	81	123	767
Kiambu	17	14	13	40	24	27	41	84	31	53	65	409
Kibusi	3											3
Kimberley										1		1
Kimuenza							1			1	1	3
Kingabwa		2		2		3	11	4	7	11	4	44
Kingston		3	1			2	1		1	1		9
Kinondoni	1	1	1	1			1					5
Kintambo	19	14	20	8	3	5	9	10	16	5	15	124

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Kirkee		1		1							2	4
Kisangani										2	1	3
Kisarawe		2	2			1	2		1	1		9
Kivu				2							1	3
Koessen	1											1
Koketime	1											1
Kokoli			1									1
Kokomlemle	2	3	1	1	2	4	2	1	2	1	2	21
Konstanz						2		1				3
Korbol										1	1	2
Korlebu											1	1
Kortrijk											1	1
Kottbus	9	11	2	5	15	73	19	7	8	8	15	172
Kotu									1	4		5
Kralingen				1	1							2
Krefeld	2	1		1	1		2	1		1		9
Kristianstad					1	1						2
Kua	1	1	1	2	1	2		3	2			13
Kunduchi			1									1
Labadi			1									1
Lagos	1	1				1	1	1	2		1	8
Lamberhurst			1		1							2
Lamin			1									1
Landau		1				1						2
Landwasser			1	2		1						4
Langensalza	1		1									2
Lansing				1					2			3
Larochelle	4	1	6	4	2		8	4	6	2	2	39
Lattenkamp						1				1		2
Lawndale	1											1
Leeuwarden						2		1				3
Leopoldville						1						1
Lexington	2	1			1	5	1		5	1	1	17
Lexington var. 15+				1							1	2
Lexington var. 15+, 34+	1											1
Lika								4				4
Lille		3		1	1		1		1			7
Lille var. 14+					1							1
Limete	1	6	1			1				1	1	11
Lindenburg	5	3	10	5	7	3	2	3	2	4	3	47
Lindern							1					1
Lindi	1											1
Litchfield	158	105	119	135	119	140	125	168	155	141	202	1567
Liverpool	3	3		2	1			1	3	4	2	19
Livingstone	18	6	5	4	6	8	9	2	3	7	9	77

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Livingstone var. 14+				1								1
Llandoff								1				1
Loanda		1			1	1		1	2	2	2	10
Lockleaze			1	1			1			1	2	6
Lomalinda	24	12	16	8	9	5	25	12	15	18	20	164
Lome	2	2				2		1				7
Lomita	5	3	3		2	4	2	6	4			29
London	23	33	28	41	26	24	22	45	28	30	37	337
London var. 15+	1	4	2	1								8
Losangeles	1											1
Loubomo						1						1
Louga								1				1
Lovelace			1									1
Lowestoft								1				1
Luciana	1	3	3	6	8	2	6	4	4	4	3	44
Madelia	21	7	12	12	16	3	4	6	6	6	11	104
Madras										1		1
Magwa		1	1									2
Maiduguri		1										1
Malika										1		1
Malstatt	2				1	1				2		6
Mampeza	1											1
Manchester				1	1	1		1				4
Mango				1								1
Manhattan	101	99	73	78	72	50	89	53	80	58	79	832
Mapo								1				1
Mara										1		1
Maracaibo							2					2
Marburg								1				1
Marshall						1						1
Maryland		1	1									2
Massenya								1				1
Matadi	27	9	4	2	9	3	5	4	2	2		67
Matopeni			2			1					3	6
Maumee					1				1			2
Mbandaka	223	189	147	231	157	163	171	173	164	190	240	2048
Mbandaka var 14+											1	1
Meekatharra						1						1
Meleagridis	207	43	39	14	13	19	6	14	8	12	20	395
Meleagridis var. 15+				1								1
Memphis	1	1		1					2		1	6
Menden				1							1	2
Mendoza		1	3	1		2		1	8	2		18
Menston		1				2		2			1	6
Mgulani	2			2				1			2	7

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Miami	52	76	99	95	81	68	130	66	103	82	64	916
Michigan	1		2	2	1	1		2	6	1	4	20
Mikawasima		2		4	6	3	5	4	1	1	6	32
Milwaukee						4						4
Mim									1			1
Minnesota	28	26	17	23	21	18	35	25	35	55	57	340
Mississippi	180	205	314	248	286	336	315	451	558	566	604	4063
Mkamba									1			1
Molade		1	1		4			2		2	3	13
Mono			1			2		2		41	31	77
Mons	2						1					3
Monschaui	11	10	3	5	5	7	5	13	21	14	10	104
Montevideo	1227	718	829	851	841	630	729	890	874	809	1061	9459
Montreal										1		1
Mornington											1	1
Morocco							1					1
Morotai		1							1			2
Moscow	1		4			1					1	7
Moualine						1						1
Moundou				1								1
Mountpleasant		1	1			1		1		1		5
Mowanjum	2											2
Mpouto		1										1
Muenchen	595	543	639	1332	642	586	603	795	739	733	753	7960
Muenster	96	73	68	65	113	64	49	70	59	93	96	846
Muenster var. 15+	1	1	1			1	1	9	2	1		17
Muenster var. 15+, 34+		1	2	4	2		1					10
Mundonobo					1					1		2
Nagoya		1					1	1		1	1	5
Namibia	1											1
Napoli	1			2	2		1		1	6	3	16
Narashino	1	1								1		3
Nchanga			1		1			2			1	5
Ndolo						1						1
Nessziona		4			1	2			1	1	3	12
Neudorf											1	1
Neukoelln									1			1
Newholland										2		2
Newlands	1											1
Newmexico		1			4	2	2	10	3	3	2	27
Newport	1985	1584	2273	2618	3074	3168	4251	4000	3329	3300	3373	32955
Newrochelle	1	1	1	1								4
Newyork	3	4		1								8
Ngili							2					2
Ngor				2								2

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Nieukerk								1				1
Nigeria	1				1			1	2			5
Nikolaifleet						1						1
Nima	4	1	5	1	5	6	13	2	5	8	15	65
Nitra	3			1		1		2				7
Nola	1	1				1						3
Norwich	52	56	67	74	69	96	106	121	106	91	119	957
Nottingham	3	5	2		4	2	1	11	1	4	2	35
Nyanza							1		1			2
Nyborg								1				1
Oakland	4			1	1	1	1	3				11
Obogu								2				2
Offa							1			1	1	3
Ohio	67	100	79	78	85	64	58	49	74	87	62	803
Ohio var. 14+						1				1	6	8
Ohlstedt									1			1
Okatie	1							4			2	7
Oldenburg			1	1			1	1				4
Onderstepoort	2			1	2	1	2	2			1	11
Ontario				1								1
Oranienburg	690	623	693	616	563	598	607	589	495	590	719	6783
Oranienburg var. 14+							2	11	2	5	9	29
Orientalis	6		1	2	5		1	8	2			25
Orion	6	3	1		3	3		5	3	2	5	31
Orion var. 15+			1	1		2	1		1			6
Orion var. 15+, 34+	1	2	2	4	2	1			1			13
Oritamerin					1	3	1		3	2	1	11
Os											1	1
Oslo	31	25	31	28	20	23	19	21	25	30	23	276
Othmarschen	6	6	7	20	27	14	17	17	23	20	11	168
Ouakam			1			1		1			4	7
Oudwijk			1			1						2
Overschie	4	3	3	2	1	1	1	2		3	3	23
Oxford									1			1
Oxford var. 15+, 34+											1	1
Oyonnax					1					2		3
Pakistan	2	4		6	3	5	5	4	5		6	40
Panama	148	144	119	132	158	162	153	184	150	149	199	1698
Papuana		1				1						2
Paratyphi A	86	72	84	77	93	86	107	110	145	121	182	1163
Paratyphi B	298	159	189	172	120	180	124	215	239	105	138	1939
Paratyphi B var. L(+) tartrate+	289	184	248	316	468	467	442	342	354	460	417	3987
Paratyphi C	1	1		1		1			2	1	1	8
Patience	1						1					2
Penarth					1	1					1	3

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Pensacola	4	7	5	8	10	8	8	2	4	14	13	83
Pharr				1								1
Planckendael		1										1
Plymouth	1									4	2	7
Poano	5				2		8	9	6	6	5	41
Poitiers										1		1
Pomona	29	43	20	28	26	38	61	68	70	68	91	542
Poona	415	294	346	249	337	331	283	211	234	196	204	3100
Portland									1		2	3
Potsdam	3	10	6	9	2	6	4	9	4	4	18	75
Powell											1	1
Praha				1	1			1		1	1	5
Presov											1	1
Putten	6	5	9	3	2	9	4	12	4	9	2	65
Quebec			1									1
Quiniela		1	1						2			4
Ramatgan				1								1
Raus	3		3	3								9
Reading	131	167	81	97	95	53	81	90	74	55	51	975
Rechovot						1		1				2
Redlands	1	1						1			1	4
Remo	2		1	2		3			1		2	11
Richmond	6	7	4	2	7	6	11	6	6	8	9	72
Ridge				1		3	1					5
Riggil						1						1
Riogrande				1								1
Rissen	5	9	6	6	10	4	7	7	7	5	18	84
Rissen var. 14+										1		1
Rittersbach							1	1				2
Riverside										1		1
Romanby	5	4	1	6	5	1	1	1	1	3	1	29
Roodepoort		1	2	2	1	1	2	6	3	3	9	30
Rostock	1					2						3
Rottnest				1								1
Rovaniemi											1	1
Rubislaw	71	81	88	98	76	66	83	103	104	100	96	966
Ruiru				1		1				1		3
Ruzizi				1			1					2
Saarbruecken			1				1				3	5
Saboya			1									1
Saintemarie									1			1
Saintpaul	562	436	479	472	548	471	548	838	695	685	588	6322
Salford					1						1	2
Sandiego	56	59	55	104	142	115	148	126	112	139	221	1277
Sangalkam									1			1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Sangera							1					1
Sanjuan				2	3						1	6
Sanktgeorg						1					2	3
Santiago	1			1				2	1			5
Sao	1											1
Sapele							1					1
Saphra	11	41	16	13	14	11	4	12	4	5	1	132
Sarajane			1									1
Schleissheim	9	6	8	6	7	4	7	8	3	6	6	70
Schoeneberg		1				1						2
Schwarzengrund	157	144	124	155	113	104	99	181	148	139	174	1538
Schwerin	1									1		2
Sculcoates			1									1
Seegefeld					1							1
Sekondi								1				1
Selby									1			1
Sendai			2	1	1		1					5
Senegal					1	2	1	1				5
Senftenberg	167	180	143	120	148	143	128	99	104	112	113	1457
Seremban	1	1			1	1	1		2	1		8
Serrekunda			1									1
Shamba		1										1
Shangani	1											1
Sherbrooke					1							1
Shipley									2			2
Shubra	2	3	4	7	5	3	7	3	2	2	3	41
Simi							1				2	3
Singapore	12	3	12	4	6	1	2	2	10	5	7	64
Sinstorf	4	8	1	3	3	7		2	1		1	30
Skansen			1									1
Soahanina		1			1					1		3
Soerenga	6	1		2	2	3	1	1	3	1	3	23
Somone	5	3	1	1		1	3				1	15
Southampton				1	1							2
Southbank	1											1
Spalentor									2			2
Splott										1		1
Stachus	1	3		2	1				1	1		9
Stanley	200	164	193	172	239	173	177	227	189	224	315	2273
Stanleyville	26	24	16	11	33	18	18	3	6	7	5	167
Stellingen		3	1					1	1			6
Stockholm				4	2					1		7
Stoneferry								1	1			2
Stormont								1				1
Stourbridge										1		1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Strasbourg	1					1			1			3
Suberu		1	1					1		1	1	5
Suelldorf				1				2	1		1	5
Sundsvall	25	47	7	4	4	4	7	11	6	9	3	127
Sya					1							1
Szentes							1					1
Tabligbo										1		1
Tafo				1								1
Takoradi	4	5	4	4			1	6	5		3	32
Taksony	5	1										6
Tallahassee	5	18	8	5	3	2	4	8	3	7	11	74
Tamale	2											2
Tambacounda		1	1	1	1							4
Tamberma											1	1
Tampico				2			1					3
Tanger						1		2				3
Tanzania											1	1
Teddington							1					1
Teko			1									1
Telaviv			1		1							2
Telelkebir	13	12	26	16	14	11	11	21	29	45	53	251
Teltow								1				1
Tennessee	96	31	63	29	24	33	36	42	57	132	312	855
Texas	1									1		2
Thies				1								1
Thompson	586	696	571	607	609	514	442	509	494	428	447	5903
Thompson var. 14+									1			1
Tienba			1									1
Tilene	7	2		1	2		2	4		1	1	20
Tokoin					4			2		1		7
Toowong		1										1
Tornow						2		2	3		1	8
Toucra	3				1		2	2	3	2	1	14
Trachau		1						1				2
Travis		1		1		1			2			5
Treforest						2						2
Treguier											1	1
Tripoli									2			2
Troy			1									1
Tsevie	1					2						3
Tshiongwe	4				2		2	2	1	4	3	18
Tucson	1	3		1			1		1	4		11
Typhi	440	349	382	352	399	344	293	362	306	350	413	3990
Typhimurium	9001	8291	8101	7126	6495	6061	6312	5905	5872	5977	5917	75058
Typhimurium var. 5-	499	827	718	926	933	979	828	865	983	1010	955	9523

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Typhisuis		3				1			2			6
Tyresoe	1								1		1	3
Uccle		1	3		2			1				7
Uganda	63	51	44	58	55	97	61	59	45	47	59	639
Uganda var. 15+	7	6	1	3	4	1	3	2	1			28
Ughelli					1					2		3
Ullevi		1										1
Umbilo											1	1
Umhlali					1							1
Uppsala	1		1		1				1		1	5
Urbana	60	57	46	56	38	53	41	60	59	44	36	550
Uzaramo			3	1	2	1		3	5		2	17
Valdosta									2			2
Vejle		2	1	1		1	1	2	4	1		13
Vejle var. 15+								1				1
Veneziana						1						1
Victoria	3	2	1			1	1					8
Vilvoorde	2	1										3
Vinohrady											1	1
Virchow	67	71	64	70	104	80	61	78	79	82	80	836
Virginia	7	2		10	1	5	4	3	10	6	13	61
Vitkin						1						1
Volkmarsdorf									1			1
Wa	1			1								2
Wagenia					1			1				2
Wandsworth	6	5		9	12	3	5	6	2	3	7	58
Wangata		1	1		2		1		3	3		11
Waral		1					1	2				4
Warnow							2	1				3
Washington	1	3		1				1				6
Waycross	4	4	2	2	5	4	1	2	2	5	2	33
Wayne	1	1										2
Welikade		1	1	1		3	1		1			8
Weltevreden	86	106	67	54	59	89	65	71	94	91	91	873
Weltevreden var. 15+			1	1	1	3			2	1	4	13
Wentworth									4			4
Wernigerode			3			1				1		5
Weslaco			2	1				1		2		6
Westeinde										1		1
Westerstede				1								1
Westhampton	6	5	3	2		3	5	8	6		3	41
Westhampton var. 15+	1			2								3
Weston								1				1
Wichita								1				1
Widemarsh	3	2		1			2	4	1		2	15

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Wien				1	1	3					3	8
Wil	1			1					1			3
Willamette									1			1
Willemstad		1										1
Winneba				1			1		1			3
Wisbech	2											2
Woodinville								2				2
Worthington	58	48	38	28	28	29	27	17	34	21	33	361
Yaba										1		1
Yarrabah	1											1
Yeerongpilly	1											1
Yehuda								1				1
Yoruba			1				1	1			1	4
Yovokome				1				1				2
Yundum							1					1
Zaiman					1							1
Zanzibar	2	2	1	1				2		1		9
Zega										2		2
Zerifin									3			3
Zwickau											1	1
I 1,3,19:-:1,7			1									1
I 3,10:e,h:-					5	6	2				2	15
I 3,10:l,v:-							1				2	3
I 3,10:l,z13:-					2	3						5
I 3,10:r:-					2						3	5
I 3,15,34:l,v:-							1					1
I 3,15:l,z13:-								1				1
I 4,12:-:1,7							1					1
I 4,12:l,v:-										1		1
I 4,[5],12:-:1,2	2	7	1	2	3	3	4	3	3	1	15	44
I 4,[5],12:b:-	8	17	5	8	8	4	12	24	50	72	70	278
I 4,[5],12:b:- var. L(+) tartrate+										6	27	33
I 4,[5],12:d:-		1				3	5				3	12
I 4,[5],12:e,h:-		2		2			2	2		2	5	15
I 4,[5],12:i:-	96	189	176	138	233	260	296	548	739	823	1200	4698
I 4,[5],12:r:-	2	3				1	1	4	17	2	1	31
I 4,[5],12:z:-			1									1
I 6,14,24:e,h:-								1				1
I 6,14,25:-:l,z13,z28											1	1
I 6,14,25:b:-	1								2		1	4
I 6,7:-:1,2						1						1
I 6,7:-:1,5	12	1	2	2	3	4	9	31	16	23	15	118
I 6,7:-:1,6								1				1
I 6,7:b:-						1			1	1		3
I 6,7:c:-											1	1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
I 6,7:e,h:-	3						2	1			2	8
I 6,7:i:-											1	1
I 6,7:k:-		6	2	1	1	3	2	5	3	3	17	43
I 6,7:l,v:-							2					2
I 6,7:l,w:-					1	2	1				1	5
I 6,7:r:-									1	1	2	4
I 6,7:z10:-	2	2										4
I 6,7:z4,z23:-							1					1
I 6,8,20:z4,z24:-											1	1
I 6,8:-:1,2			1	1	1	1		1		2	1	8
I 6,8:-:1,5					2		1			1		4
I 6,8:-:e,n,x								1				1
I 6,8:b:-										1		1
I 6,8:d:-	1	1		2	1		3	1	1		1	11
I 6,8:e,h:-		2	1			1		2	3		2	11
I 6,8:i:-					2							2
I 6,8:z10:-							1					1
I 9,12:-:1,5					1	2	5	1	1		3	13
I 9,12:a:-							1					1
I 9,12:g,z51:-											1	1
I 9,12:l,v:-			1				3	1			2	7
I 9,12:l,z28:-	5	8	4	6	9	6	12	15	1	7	9	82
I 11:e,h:-									1			1
I 11:r:-								2				2
I 11:z10:-											1	1
I 13,22:-:1,6					1					1		2
I 13,22:b:-						1	2					3
I 13,22:z:-											1	1
I 13,23:-:1,5									1			1
I 13,23:b:-	1							4	3	8	4	20
I 13,23:i:-				1			1					2
I 16:d:-					1							1
I 16:e,h:-								1				1
I 16:l,v:-			3							2		5
I 28:i:-											1	1
I 38:k:-		1							1			2
I 40:-:e,n,x									2			2
I 43:k:-											3	3
I 45:b:-				1							2	3
I 47:z4,z23:-					1				1		13	15
II 4,12,[27]:b:[e,n,x]		2	1			1		1	1			6
II 4,12,[27]:z:e,n,x				1								1
II 4,12:-:1,6									1			1
II 4,12:a:-						1						1
II 4,12:l,w:e,n,x	2		1	3	4							10

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
II 6,7:b:z42										1		1
II 6,7:l,z28:1,5:[z42]			1									1
II 6,7:m,t:-								1				1
II 6,7:z39:1,5,7								1				1
II 6,7:z:1,5											1	1
II 9,12:b:-									1			1
II 9,12:d:e,n,x								1				1
II 9,12:g,m,[s],t:[1,5,7]:[z42]		1		1		5	1	2				10
II 9,12:g,m,s,t:e,n,x										1		1
II 9,12:g,s,t:e,n,x							1			1		2
II 9,12:l,w:e,n,x							1					1
II 9,12:l,z28:1,5					1							1
II 9,12:m,t:e,n,x		1										1
II 9,12:z39:1,7					2							2
II 9,46:g,[m],[s],t:[e,n,x]					1							1
II 9,46:m,t:e,n,x									1			1
II 11:g,[m],s,t:z39							1			1		2
II 11:m,t:e,n,x					1							1
II 13,22:g,m,t:[1,5]	1	1										2
II 13,22:z29:1,5							1	3				4
II 13,23:a:z42	1											1
II 13,23:b:[1,5]:z42	1											1
II 13,23:g,m,[s],t:[e,n,x]				1			1					2
II 13,23:z:1,5	1				1							2
II 16:z35:e,n,x									1			1
II 17:g,t:-					1	2	1					4
II 21:b:1,5								3				3
II 21:z10:[z6]					1	2					1	4
II 30:l,z28:z6									1	1	1	3
II 35:g,m,s,t:-							1					1
II 35:l,z28:-											1	1
II 35:z29:e,n,x								1				1
II 40:c:e,n,x,z15					1							1
II 40:m,t:-							1					1
II 40:z39:1,7											1	1
II 40:z4,z24:z39				1				1				2
II 41:z10:z6				1			1					2
II 42:b:e,n,x,z15	1						1			1		3
II 43:b:-	1											1
II 44:z4,z23:-										1		1
II 47:b:1,5	9	5	4	6	6	2		5	1	8	2	48
II 47:b:e,n,x,z15											1	1
II 47:d:1,5	1											1
II 47:d:z39					2		4					6
II 48:a:z39		1										1

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
II 48:a:z6						2	2	1			1	6
II 48:b:z6								1				1
II 48:d:1,2									1			1
II 48:d:z6	1	1		1	3		4		1	1	2	14
II 48:g,m,t:-				1								1
II 48:k:z39			1				1					2
II 48:z39:z81								1	2	1		4
II 50:b:z6	1	1	4	3	1	2	4	4	2	1	2	25
II 58:c:z6											2	2
II 58:d:z6		1			1	1			1			4
II 58:l,z13,z28:z6	1	2	2						1	1	2	9
II 60:g,m,t:z6	1											1
IIIa 13,22:z4,z23:-											1	1
IIIa 13,23:g,z51:-											1	1
IIIa 17:z4,z23:-							1					1
IIIa 18:z36:-											1	1
IIIa 18:z4,z23:-							1	7	4	13	19	44
IIIa 18:z4,z32:-	1							2			1	4
IIIa 21:g,z51:-		1			1		1			2	2	7
IIIa 21:z36:-											1	1
IIIa 35:g,z51:-										1		1
IIIa 35:z29:-									1			1
IIIa 35:z4,z23:-										1	1	2
IIIa 40:g,z51:-					1			2				3
IIIa 40:z4,z23:-			1		1	1					2	5
IIIa 40:z4,z24:-											1	1
IIIa 41:z4,z23:-	1	3			1		4	2	11	6	11	39
IIIa 42:z4,z23:-		1									1	2
IIIa 42:z4,z24:-										1		1
IIIa 43:z29:-						1				1		2
IIIa 43:z4,z24:-										1		1
IIIa 44:z4,z23:-		13			5				1			19
IIIa 44:z4,z24:-								1			2	3
IIIa 45:z4,z24:-							1					1
IIIa 47:g,z51:-			1									1
IIIa 47:z4,z23:-	2	3									3	8
IIIa 48:g,z51:-		1		3	4	2	7	4	3	3	6	33
IIIa 48:z29:-							1				1	2
IIIa 48:z36:-						1					1	2
IIIa 48:z4,z23:-		2					2					4
IIIa 48:z4,z24:-	1	1		1	2	2		3		3	4	17
IIIa 48:z4,z32:-			1									1
IIIa 50:z4,z32:-											2	2

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
IIIa 53:g,z51:-		1			1					1		3
IIIa 53:z4,z23,z32:-				4	2							6
IIIa 53:z4,z23:-		1		2					1	3	5	12
IIIa 53:z4,z24:-						1				1		2
IIIa 56:z4,z23:-		1			1					3	1	6
IIIa 59:z29:-								1				1
IIIa 59:z36:-								1				1
IIIa 59:z4,z23:-		1										1
IIIa 62:z4,z23:-							1					1
IIIa 63:z4,z23:-											2	2
IIIb (6),14:z10:z					1							1
IIIb 11:k:z53										1		1
IIIb 11:l,[v],[z13]:z53											1	1
IIIb 16:z10:e,n,x,z15		1	2		1	1	2	2	1			10
IIIb 17:l,v:e,n,x,z15								1				1
IIIb 17:z10:e,n,x,z15							1		1			2
IIIb 18:l,[v],[z13]:z									4			4
IIIb 35:i:z											1	1
IIIb 35:k:e,n,x,z15											1	1
IIIb 35:l,v:z35		2				1		1				4
IIIb 35:r:e,n,x,z15		1									1	2
IIIb 38:(k):-											1	1
IIIb 38:(k):z35					1		1	2			1	5
IIIb 38:l,v:z53		1			1	1						3
IIIb 38:r:z										1		1
IIIb 42:(k):z35											1	1
IIIb 47:k:e,n,x,z15	1											1
IIIb 47:k:z35	1	1	1	1			2		1		1	8
IIIb 47:k:z53		1										1
IIIb 47:r:z53								1				1
IIIb 48:-:z35											1	1
IIIb 48:c:z				1		1		2				4
IIIb 48:i:-											1	1
IIIb 48:i:z	4	3		1	3	2	1	2	3	4	8	31
IIIb 48:r:z									1			1
IIIb 48:z52:z	1				1			1	1	1		5
IIIb 50:k:e,n,x,z15			1									1
IIIb 50:k:z			1	1	1		4	6	3		1	17
IIIb 50:k:z53							1				2	3
IIIb 50:l,v:z35									1			1
IIIb 50:r:-					1							1
IIIb 50:r:z	1						2	1	3	1	10	18
IIIb 50:z52:z35							1	1	1		1	4
IIIb 50:z52:z53		1										1
IIIb 50:z:z52		2				1	1	1				5

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
IIIb 53:k:e,n,x,z15			1								1	2
IIIb 53:k:z								1				1
IIIb 53:z10:z35										1	1	2
IIIb 58:z52:z35			1						1			2
IIIb 60:r:-						1						1
IIIb 60:r:e,n,x,z15	1		1	1		2	1	4	4	1	4	19
IIIb 60:r:z	1	2	1	1	1		1	2	1			10
IIIb 60:r:z53		1										1
IIIb 60:z52:z53						1					2	3
IIIb 61:(k):z53						1						1
IIIb 61:-:1,5,[7]		1			2	1		2	1	2		9
IIIb 61:c:-								1				1
IIIb 61:c:z35	1		2			2	1	2	1	3	1	13
IIIb 61:i:z		1					1	1				3
IIIb 61:i:z53			1								1	2
IIIb 61:k:1,5,[7]	5	1		4	2	3		1		2	2	20
IIIb 61:k:z35	1											1
IIIb 61:l,[v],[z13]:-							1					1
IIIb 61:l,[v],[z13]:1,5,[7]		4	2	3			17	2	2	1	11	42
IIIb 61:l,[v],[z13]:z35								3	1			4
IIIb 61:l,v:z										3		3
IIIb 61:r:z						1			1			2
IIIb 61:r:z53			1			2	1	1				5
IIIb 61:z52:z53			1					1	1	1	4	8
IIIb 65:(k):z	1	3		1								5
IIIb 65:i:e,n,x,z15		1										1
IIIb 65:l,v:z53		2										2
IIIb 65:z10:e,n,x,z15											2	2
IV 6,7:z4,z23:-	2	3	1		2	1		1				10
IV 6,7:z4,z24:-	16	4	14	4	15	7	9	8	2		1	80
IV 11:z4,z23:-	7	2	4	2		2	1	1		1	3	23
IV 16:z4,z23:-		2		1						1		4
IV 16:z4,z32:-	11	8	8	6	13	20	11	4	3	5	7	96
IV 18:z36,z38:-		1										1
IV 21:g,z51:-							1					1
IV 21:z4,z23:-					1					2		3
IV 38:z4,z23:-		1			1							2
IV 40:z4,z24:-											1	1
IV 40:z4,z32:-				2	2					1	1	6
IV 43:z36,z38:-	2				1				1			4
IV 43:z4,z23:-	21	1	6	10	3	5		3	7	1	4	61
IV 43:z4,z32:-	1	2	1				2			1		7
IV 44:z36,[z38]:-						1	4	2	1			8
IV 44:z4,z23:-	8	6	7	17	4	5	15	14	7	16	11	110
IV 44:z4,z24:-			3		1	1			2	1		8

TABLE 3

Salmonella isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
IV 44:z4,z32:-	4			2	1		3		1	5	7	23
IV 45:g,z51:-	8	10	3	1	4	5	1	8	8	8	7	63
IV 48:g,z51:-	84	41	48	46	46	46	42	30	13	5	11	412
IV 48:z4,z23:-								2				2
IV 48:z4,z32:-					1	1		1	1		3	7
IV 50:g,z51:-	18	15	6	14	6	16	23	9	9	7	16	139
IV 50:z4,z23:-	34	43	56	64	59	14	7	6	7	6	64	360
IV 50:z4,z32:-	1			1							2	4
IV 51:z4,z23:-			1									1
S. bongori ser. 44:z39:-		1										1
S. bongori ser. 48:z35:-	1				1				1	2		5
S. bongori ser. 66:z81:-									1			1
Partially serotyped	1161	696	829	914	1013	1288	1244	1362	1324	1684	1448	12963
Rough, mucoid, and/or nonmotile isolates	36	25	35	4	14	21	48	52	61	39	110	445
Unknown	667	361	497	385	634	573	2530	3610	1999	1113	4042	16411
Total	**39035**	**34607**	**33971**	**32828**	**33556**	**31876**	**34911**	**37442**	**35661**	**36214**	**40666**	**390767**

TABLE 3a

Salmonella partially serotyped isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Group 51	1					2						3
Group 52	2											2
Group 53	5	1	1		1	1	1					10
Group 56	3					1						4
Group 58		1		1	1	1		1				5
Group 60	4	1	1		1							7
Group 62				1								1
Group 63				1								1
Group 65	1				1	1	1					4
Group F	5	2	6		2	46	7	1	10	35	20	134
Group G	41	8	17	17	18	30	22	1	11	22	15	202
Group H	2		1	2	5		5	1		2		18
Group I	5	2	40	44	4	5	2	2	1	7	10	122
Group J	1			1		8	2	1		1	5	19
Group K	5	1	3	4	3	4	4	2		2	2	30
Group L			1		1	2	1			5	3	13
Group M						1	3		4	8	5	21
Group N	1		1			1	2			5	2	12
Group O											1	1
Group P											5	5
Group Q		1	1	2							3	7
Group R	3		2	1	8	6	3	1	1	4	6	35
Group S	4	2	1	1	3	5		1			1	18
Group T	1											1
Group U	3	1			1					1	1	7
Group V	19	17	5	5	2	9	10	5	4	1		77
Group W	13	1	2	2		4	4	1	2		1	30
Group X	5	3		3		1				1	2	15
Group Y	10	4	4	10	8	13	11	5	1	18	2	86
Group Z	14	8	3	10	17	99	72	4	18	114	47	406
Subspecies I	18	10	45	77	76	43	53	99	157	155	101	834
Subspecies I, Group A	3	1	2	4		2	4	4	1	2	7	30
Subspecies I, Group B	474	293	394	366	503	430	561	447	404	479	528	4879
Subspecies I, Group C1	107	88	77	135	87	108	112	160	141	138	206	1359
Subspecies I, Group C2	102	62	47	46	36	103	87	213	151	191	105	1143
Subspecies I, Group D1	170	105	106	79	95	199	140	257	269	283	200	1903
Subspecies I, Group D2	3	1		1	1		1	1	3	5		16
Subspecies I, Group E1	23	15	15	17	39	55	24	39	35	35	16	313
Subspecies I, Group E4	2	2	1	2		1		9	6	7	9	39
Subspecies I, Group O:11											1	1
Subspecies I, Group O:13											4	4
Subspecies I, Group O:30							1					1
Subspecies I, Group O:35							1					1
Subspecies I, Group O:38										1	1	2
Subspecies I, Group O:40											1	1

TABLE 3a

Salmonella partially serotyped isolates from human sources by serotype and year, 1996-2006

	Year											
Serotype	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**Total**
Subspecies I, Group O:47											1	1
Subspecies I, Group O:48								2				2
Subspecies I, Group O:51											1	1
Subspecies II	21	7	4	5	8	10	5	2	5	9	3	79
Subspecies IIIa	11	5	12	16	11	16	11	17	24	27	20	170
Subspecies IIIa, Group O:13								1			1	2
Subspecies IIIa, Group O:40											1	1
Subspecies IIIa, Group O:48											1	1
Subspecies IIIa, Group O:63							1					1
Subspecies IIIa/IIIb	31	22	13	19	36	41	40	32	25	40	29	328
Subspecies IIIb	13	10	6	9	18	6	21	26	16	32	22	179
Subspecies IIIb, Group O:35	3		1	4	1	5	6	1	1	1		23
Subspecies IIIb, Group O:38	1	1	1		2	1	3	2	1	4		16
Subspecies IIIb, Group O:42										1		1
Subspecies IIIb, Group O:47								1		3	18	22
Subspecies IIIb, Group O:50											1	1
Subspecies IIIb, Group O:57							1					1
Subspecies IIIb, Group O:60											1	1
Subspecies IIIb, Group O:61	10			4	2	5	2				1	24
Subspecies IIIb, Group O:65										1		1
Subspecies IV	20	21	16	25	22	23	19	23	33	44	33	279
Subspecies IV, Group O:11							1					1
Subspecies IV, Group O:43											1	1
Subspecies IV, Group O:50											2	2
Subspecies VI	1										2	3
Total	**1161**	**696**	**829**	**914**	**1013**	**1288**	**1244**	**1362**	**1324**	**1684**	**1448**	**12963**

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=New England

	State						
Serotype	**Connecticut**	**Maine**	**Massachusetts**	**New Hampshire**	**Rhode Island**	**Vermont**	**Total**
Aba					1		1
Abaetetuba			1				1
Adelaide			3	1			4
Agona	7		26	4	4	2	43
Agoueve			1				1
Alachua	2						2
Albany	1						1
Anatum	5		8	2	1		16
Apapa			2				2
Bareilly	3		1				4
Benin	1						1
Berta	9		7		1		17
Blockley	1		7		3		11
Bonariensis			2				2
Bovismorbificans			3				3
Braenderup	10		21	2	2		35
Brandenburg			2				2
Bredeney			2				2
Carmel			1				1
Carrau			2				2
Cerro			1				1
Chester	1						1
Choleraesuis	1		1				2
Choleraesuis var. Kunzendorf			1				1
Colindale			1	1			2
Concord			3				3
Daytona	1						1
Derby			2				2
Dublin	1		5				6
Durban			2		1		3
Ealing			1				1
Eastbourne	1		3				4
Enteritidis	111	1	285	43	28	14	482
Fluntern				2			2
Gaminara			6		1		7
Give			4				4
Hadar	6		31	3	1	1	42
Hartford	3		9	1			13
Havana			5				5
Heidelberg	12		58	7	8		85
Hofit			1				1
Hvittingfoss			1		1		2
Indiana			4				4
Infantis	5		20	5	1		31

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=New England

	State						
Serotype	**Connecticut**	**Maine**	**Massachusetts**	**New Hampshire**	**Rhode Island**	**Vermont**	**Total**
Istanbul			1				1
Javiana	1	3	29	4			37
Johannesburg			1				1
Kentucky	2		4	2			8
Kiambu	1		6				7
Kingabwa			1				1
Kottbus			1				1
Litchfield	3	1	15	2	1		22
Lomalinda			1		1		2
London			1				1
Manhattan	1		9	1	1		12
Mbandaka	2		6	1			9
Meleagridis			1				1
Miami	3		1	1			5
Minnesota			5	1			6
Mississippi	4		11	1			16
Monschaui	1						1
Montevideo	9	2	27	7	1	4	50
Muenchen	4	1	11	3			19
Muenster	1		6	1			8
Nagoya			1				1
Newmexico					1		1
Newport	34	1	63	10	12		120
Norwich	1				1		2
Ohio	1		3				4
Oranienburg	8		57	11	8	1	85
Oranienburg var. 14+				6			6
Oslo	1		2				3
Overschie			1				1
Panama	3		9	1	1		14
Paratyphi A	3		11				14
Paratyphi B				4	1		5
Paratyphi B var. L(+) tartrate+	7		13		4	2	26
Pensacola	1						1
Pomona	1		5				6
Poona	1		1		2		4
Reading	1		5				6
Richmond			2		1		3
Roodepoort			1				1
Rubislaw	2	1	1	1			5
Saintpaul	12	1	25	3			41
Sandiego	2	1	22	4	1	1	31
Schwarzengrund	4	1	16				21
Senftenberg	2		1	1			4

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=New England

	State						
Serotype	**Connecticut**	**Maine**	**Massachusetts**	**New Hampshire**	**Rhode Island**	**Vermont**	**Total**
Soerenga	1						1
Stanley	1	2	8	3	1		15
Telelkebir				1			1
Tennessee	2		7		1	2	12
Thompson	6		18	6	1		31
Typhi	4		21		2		27
Typhimurium	86	2	209	32	24	7	360
Typhimurium var. 5-			62	9	4	1	76
Uganda	1		3				4
Urbana			1			1	2
Uzaramo						1	1
Virchow	1		3	1			5
Weltevreden	1		7				8
Worthington	1						1
I 3,10:l,v:-			1				1
I 4,[5],12:-:1,2			1				1
I 4,[5],12:b:-	2						2
I 4,[5],12:e,h:-	2		1				3
I 4,[5],12:i:-	33		62	12	7	2	116
I 6,7:-:1,5			1				1
I 6,7:k:-			1				1
I 9,12:l,v:-					1		1
I 9,12:l,z28:-			1				1
I 11:z10:-			1				1
I 47:z4,z23:-	2						2
II 50:b:z6				1			1
IIIa 35:z4,z23:-			1				1
IIIa 41:z4,z23:-			1				1
IIIb 61:z52:z53					2		2
IV 44:z4,z23:-			1				1
IV 48:g,z51:-			1		1		2
IV 48:z4,z32:-			1				1
IV 50:g,z51:-			2	1			3
IV 50:z4,z23:-			1				1
IV 50:z4,z32:-				1			1
Partially serotyped	1	2		2		1	6
Rough, mucoid, and/or nonmotile isolates	3		6		2		11
Unknown	27	95		2		2	126
Total	**471**	**114**	**1331**	**207**	**135**	**42**	**2300**

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mid Atlantic

	States			
Serotype	**New Jersey**	**New York**	**Pennsylvania**	**Total**
Aarhus		4		4
Aberdeen		1	4	5
Adelaide	2	5	4	11
Agama		3		3
Agbeni		2	1	3
Agona	22	37	32	91
Alachua	3	2	4	9
Albany	1	3	5	9
Altona		1		1
Amsterdam		1		1
Anatum	6	20	6	32
Anatum var. 15+	1			1
Anfo		1		1
Apapa			1	1
Baildon	1	8		9
Bardo		1		1
Bareilly	8	5	2	15
Beaudesert	1			1
Benin			1	1
Bere			2	2
Berta	1	15	39	55
Blockley	7	11	3	21
Bournemouth	1			1
Bousso			1	1
Bovismorbificans	7	4	4	15
Braenderup	35	38	34	107
Brandenburg	5	4	1	10
Brazzaville		3		3
Bredeney			3	3
Bron		1		1
Cerro			4	4
Chester		1	2	3
Choleraesuis		1		1
Choleraesuis var. Kunzendorf			3	3
Clackamas			1	1
Claibornei		1		1
Coeln	1			1
Colindale	1	2	1	4
Concord		4		4
Corvallis	1	1	1	3
Cotham			3	3
Cubana		2	3	5
Cuckmere		1		1
Derby	2	22	2	26

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mid Atlantic

	States			
Serotype	**New Jersey**	**New York**	**Pennsylvania**	**Total**
Doorn		1		1
Dublin	4	11	5	20
Durban	1	1		2
Durham		1		1
Ealing	2			2
Eastbourne	1	1		2
Edinburg		8	1	9
Enteritidis	286	779	614	1679
Eppendorf		1		1
Florida		2		2
Friedenau		1		1
Frintrop		1		1
Fyris	2			2
Gaminara	2		2	4
Gatuni		1		1
Give	2	6	3	11
Glostrup		2		2
Grandhaven	1			1
Grumpensis		1	1	2
Gwale			1	1
Haardt		4		4
Hadar	16	55	16	87
Hartford	6	15	13	34
Havana	1		2	3
Heidelberg	58	188	79	325
Hindmarsh			1	1
Holcomb		1		1
Hvittingfoss		13	4	17
Ibadan		1		1
Indiana	2	5		7
Infantis	13	33	30	76
Inverness		2		2
Irumu	1			1
Isangi		1		1
Istanbul		6		6
Ituri	1			1
Javiana	17	59	31	107
Jerusalem		1		1
Johannesburg	1	5		6
Jukestown			1	1
Kalamu		1		1
Kapemba	1			1
Kedougou	1			1
Kentucky	3	13	44	60

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mid Atlantic

	States			
Serotype	**New Jersey**	**New York**	**Pennsylvania**	**Total**
Kiambu	1	9		10
Kimuenza			1	1
Kintambo		2	4	6
Kokomlemle		2		2
Kottbus		1		1
Lagos		1		1
Lexington var. 15+			1	1
Lindenburg		3		3
Litchfield	9	13	19	41
Livingstone	1		1	2
London	1	2	4	7
Madelia		1		1
Manhattan	3	6	2	11
Matopeni		2		2
Mbandaka		14	19	33
Meleagridis		1		1
Miami	1	6	1	8
Michigan			1	1
Mikawasima	1	3		4
Minnesota		2		2
Mississippi	6	10	8	24
Montevideo	21	61	22	104
Mornington		1		1
Moscow		1		1
Muenchen	15	49	14	78
Muenster	6	5	12	23
Napoli		1		1
Nchanga		1		1
Newmexico			1	1
Newport	81	180	129	390
Nima		7		7
Norwich		7		7
Nottingham	1			1
Ohio	3	8	4	15
Oranienburg	17	57	34	108
Oranienburg var. 14+	1			1
Oritamerin		1		1
Oslo	1	1	1	3
Othmarschen	2	1		3
Ouakam			1	1
Panama	9	17	8	34
Paratyphi A	14	32	8	54
Paratyphi B		3	18	21
Paratyphi B var. L(+) tartrate+	11	21	33	65

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mid Atlantic

	States			
Serotype	**New Jersey**	**New York**	**Pennsylvania**	**Total**
Paratyphi C		1		1
Pensacola	4		2	6
Pomona	6	12	6	24
Poona	3	8	15	26
Powell			1	1
Praha		1		1
Presov		1		1
Reading	3	4	1	8
Redlands		1		1
Richmond	1	1		2
Rissen	1	1		2
Romanby	1			1
Roodepoort	1			1
Rovaniemi			1	1
Rubislaw	1	2		3
Saintpaul	27	49	35	111
Sandiego	17	35	7	59
Sanktgeorg	2			2
Schwarzengrund	11	32	20	63
Senftenberg	4	9	2	15
Somone		1		1
Stanley	9	22	32	63
Stanleyville	1			1
Suelldorf		1		1
Telelkebir		3	3	6
Tennessee	4	48	20	72
Thompson	10	64	27	101
Tornow			1	1
Treguier		1		1
Typhi	29	106	14	149
Typhimurium	139	433	471	1043
Typhimurium var. 5-	98	44		142
Uganda	3	6	2	11
Urbana	1	2	1	4
Uzaramo			1	1
Virchow	3	9	4	16
Virginia	2			2
Wandsworth		1	1	2
Waycross			1	1
Weltevreden	2	8	1	11
Widemarsh		1		1
Worthington		2	2	4
Zwickau			1	1
I 4,[5],12:-:1,2	5	1		6

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mid Atlantic

	States			
Serotype	**New Jersey**	**New York**	**Pennsylvania**	**Total**
I 4,[5],12:b:-	3	16		19
I 4,[5],12:d:-	1			1
I 4,[5],12:e,h:-		1		1
I 4,[5],12:i:-	57	147		204
I 6,7:-:1,5	3	2		5
I 6,7:i:-		1		1
I 6,7:k:-		4		4
I 6,7:l,w:-	1			1
I 6,8:-:1,2	1			1
I 9,12:l,v:-	1			1
I 47:z4,z23:-	3	2		5
II 6,7:z:1,5		1		1
II 40:z39:1,7	1			1
IIIa 40:z4,z23:-		1		1
IIIb 50:r:z		1		1
IIIb 60:z52:z53	1			1
IIIb 61:l,[v],[z13]:1,5,[7]		1		1
IIIb 61:z52:z53	1			1
IV 16:z4,z32:-	1	1		2
IV 43:z4,z23:-	1			1
IV 44:z4,z23:-	1			1
IV 44:z4,z32:-		2		2
IV 45:g,z51:-		1		1
IV 48:g,z51:-			1	1
IV 50:g,z51:-	1	1	2	4
IV 50:z4,z32:-	1			1
Partially serotyped		33	23	56
Rough, mucoid, and/or nonmotile isolates	5	1		6
Unknown	1	27	51	79
Total	***1205***	***3110***	***2110***	***6425***

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East North Central

	States					
Serotype	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**	**Total**
Abaetetuba		1				1
Adelaide	4		1	2	2	9
Agbeni	2			2	1	5
Agona	20	9	8	10	21	68
Agoueve			1		1	2
Ajiobo	1					1
Alachua	1					1
Amsterdam	1					1
Anatum	6	8	10	2	16	42
Anatum var. 15+			1		1	2
Apapa		1				1
Baildon		1	2			3
Bareilly	3	4	1	1	3	12
Bargny	1					1
Barranquilla	1				1	2
Beaudesert					1	1
Berta	16	7	13	3		39
Blockley	1	2		2	1	6
Bonn			1			1
Bovismorbificans	3	10	2	1	3	19
Braenderup	20	14	27	10	10	81
Brandenburg	8	2	2	1	2	15
Bredeney		1	1	1		3
Buzu		1				1
Carrau	1	1				2
Cerro		1			1	2
Chester	1	3	1			5
Chincol	1					1
Choleraesuis					1	1
Choleraesuis var. Kunzendorf					1	1
Colindale			1			1
Concord	2					2
Corvallis	5				2	7
Cotham		1	1		1	3
Cubana				1		1
Derby	9	4	4	2	5	24
Dublin	1	1	1			3
Durban		1	1		1	3
Durham					1	1
Ealing	2					2
Eastbourne	1					1
Edinburg			1		1	2
Emek	1					1
Enteritidis	182	131	187	52	155	707
Essen					1	1

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East North Central

	States					
Serotype	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**	**Total**
Gaminara	1			2	1	4
Give	3	1	1	2	3	10
Grumpensis			1			1
Hadar	9	4	9	1	6	29
Haifa	3				2	5
Hartford	7	20	8	3	2	40
Hato					1	1
Havana		1	1			2
Heidelberg	36	28	43	14	21	142
Hindmarsh					2	2
Holcomb				2		2
Hull			1		1	2
Hvittingfoss		1				1
Indiana		1		1		2
Infantis	13	7	9	1	21	51
Inverness	1				1	2
Javiana	6	7	22	5	9	49
Johannesburg	1		1			2
Kentucky	2	1	1	2	6	12
Kiambu			2		11	13
Kintambo	1		1	1	2	5
Kisangani			1			1
Kottbus			1			1
Limete	1					1
Litchfield	3	2	2	1	8	16
Lomalinda			3			3
London	3				1	4
Manhattan	2	1	3	2	1	9
Mbandaka	21	5	7	4	10	47
Meleagridis			2		1	3
Miami		1		1	1	3
Minnesota	2	1	1		2	6
Mississippi	1			6	1	8
Monschaui	2				1	3
Montevideo	21	7	18	7	23	76
Muenchen	14	9	15	6	12	56
Muenster	1	3	1	1	5	11
Newport	74	45	54	21	67	261
Nima					1	1
Norwich		2	1		1	4
Ohio	3	1	4		4	12
Ohio var. 14+					2	2
Oranienburg	26	7	21	17	13	84
Oranienburg var. 14+					1	1
Oslo					1	1

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East North Central

	States					
Serotype	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**	**Total**
Othmarschen					1	1
Oxford var. 15+, 34+		1				1
Panama	3	1		1	1	6
Paratyphi A	8	3	3	2	3	19
Paratyphi B	5	1	18	1		25
Paratyphi B var. L(+) tartrate+	5	27		6	11	49
Poano			1			1
Pomona	1		7	1		9
Poona	4	2	4	6	1	17
Putten			1		1	2
Reading	1	1	3			5
Richmond	1					1
Rissen	1					1
Rubislaw	1					1
Saintpaul	16	12	13	4	23	68
Sandiego	2	5	6	3	2	18
Schwarzengrund	7	3	2	2	6	20
Senftenberg	2	1	1	1	2	7
Shubra				1		1
Singapore	1					1
Stanley	7		15	1	10	33
Takoradi					1	1
Tallahassee					2	2
Tamberma			1			1
Telelkebir			3		2	5
Tennessee	13	9	11		16	49
Thompson	11	7	25	5	4	52
Typhi	18	2	8		7	35
Typhimurium	185	81	172	54	108	600
Typhimurium var. 5-		29		13	54	96
Uganda	1	1			8	10
Urbana		2	2		2	6
Virchow	1	2	1	3	2	9
Weltevreden	3	8			3	14
Worthington	2		2			4
I 4,[5],12:-:1,2					3	3
I 4,[5],12:b:-	9				1	10
I 4,[5],12:b:- var. L(+) tartrate+					19	19
I 4,[5],12:i:-	45	232			47	324
I 6,7:-:1,5	2					2
I 6,7:r:-	2					2
I 9,12:l,z28:-	1					1
I 45:b:-		2				2
II 47:b:e,n,x,z15	1					1
II 48:d:z6					2	2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East North Central

	States					
Serotype	**Illinois**	**Indiana**	**Michigan**	**Ohio**	**Wisconsin**	**Total**
IIIa 13,22:z4,z23:-	1					1
IIIa 18:z4,z23:-		1				1
IIIa 41:z4,z23:-		1				1
IIIa 48:z4,z24:-					1	1
IIIb 35:k:e,n,x,z15					1	1
IIIb 38:(k):-					1	1
IIIb 47:k:z35					1	1
IIIb 48:i:z		1		1	2	4
IV 11:z4,z23:-		1				1
IV 44:z4,z23:-				2		2
IV 44:z4,z32:-			1			1
IV 48:g,z51:-				1		1
IV 50:g,z51:-		1				1
IV 50:z4,z23:-				1	1	2
Partially serotyped	4		59	17	13	93
Rough, mucoid, and/or nonmotile isolates	9	1			4	14
Unknown	13	1	146	52	2	214
Total	**937**	**798**	**1006**	**368**	**846**	**3955**

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=West North Central

	States							
Serotype	**Iowa**	**Kansas**	**Minnesota**	**Missouri**	**Nebraska**	**North Dakota**	**South Dakota**	**Total**
Aberdeen		1	1					2
Adelaide			3					3
Agbeni				1				1
Agona	19	4	15	5	2	2	1	48
Albany			2				1	3
Altona			1					1
Amherstiana			1					1
Amoutive	1							1
Amsterdam				1				1
Amsterdam var. 15+	1							1
Anatum	9	2	7	9	4		1	32
Anatum var. 15+			1					1
Apapa							1	1
Aqua		1						1
Bardo	1	2		1				4
Bareilly		1	4	19	2			26
Barranquilla					1		1	2
Bergen				1				1
Berta	2	2	5	6			1	16
Blockley			2					2
Bovismorbificans	3		2	2			1	8
Braenderup	6	8	10	8		1		33
Brandenburg			5	5				10
Bredeney				1	2			3
Cerro		1		1	2			4
Choleraesuis					1			1
Choleraesuis var. Kunzendorf							1	1
Coeln				1				1
Concord			3					3
Corvallis			1					1
Dahra		1						1
Derby	2		6	1			1	10
Dublin	3						1	4
Ealing						1		1
Eastbourne			1					1
Edinburg			1					1
Enteritidis	86	33	180	111	24	11	21	466
Eppendorf			1					1
Gaminara	2	1		1				4
Give		1		1				2
Guinea			1					1
Hadar	4	4	5	4	1		2	20
Hartford	4	8	7	9				28
Havana	1			2				3

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=West North Central

	States							
Serotype	**Iowa**	**Kansas**	**Minnesota**	**Missouri**	**Nebraska**	**North Dakota**	**South Dakota**	**Total**
Heidelberg	6	20	23	38	8	3	5	103
Herston			1					1
Hindmarsh	2							2
Hvittingfoss				1				1
Indiana	1							1
Infantis	5	5	15	12	5	2	8	52
Irumu			1					1
Javiana	1	4	5	11	1		2	24
Kentucky				1			1	2
Kiambu			2	2			1	5
Kintambo			1					1
Kivu						1		1
Kottbus			2					2
Litchfield	2	2	5	3	1			13
Lomalinda				1				1
London			1	4			2	7
Madelia				1				1
Manhattan			2	4				6
Mbandaka	1		1	2			3	7
Meleagridis	1	1	1					3
Miami		1	5					6
Minnesota		2	1	2				5
Mississippi			2	10				12
Mono	29							29
Montevideo	17	6	21	11	10	4	6	75
Muenchen	4	4	10	14	3		3	38
Muenster	3	1	5	1	2	1		13
Newport	35	30	54	82	10	3	11	225
Nima				3				3
Norwich	1	5	4	12			1	23
Ohio	1		2	1				4
Oranienburg	4	1	5	16	5	2	2	35
Orion				1				1
Othmarschen				1				1
Panama	3	1	2	7	3			16
Paratyphi A	1	2	3	1				7
Paratyphi B	8	1					5	14
Paratyphi B var. L(+) tartrate+		2	23	20	3	3		51
Poano	2							2
Pomona			1	3				4
Poona	1	2	4	3				10
Portland						1		1
Reading	1		1	1			2	5
Richmond			1	1				2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=West North Central

	States							
Serotype	**Iowa**	**Kansas**	**Minnesota**	**Missouri**	**Nebraska**	**North Dakota**	**South Dakota**	**Total**
Rissen		1	1	1				3
Rubislaw		1		1				2
Saintpaul	3	3	16	13	1		2	38
Sandiego	3	2	3	4		3	1	16
Schwarzengrund	1		1	1	3	1		7
Senftenberg	1	1	3	1	1			7
Stanley			7	6			1	14
Stanleyville	1							1
Tanzania	1							1
Telelkebir				1				1
Tennessee	6	5	5	12	2		2	32
Thompson	4	6	10	26	5		3	54
Typhi			5	2			1	8
Typhimurium	53	56	157	231	29	14	53	593
Typhimurium var. 5-	32	13	34		19			98
Uganda	1	1						2
Urbana	1		1	1			1	4
Virchow	4		5	1				10
Virginia		1						1
Wandsworth					1		1	2
Worthington				3				3
I 3,10:r:-			3					3
I 4,[5],12:b:-			1					1
I 4,[5],12:b:- var. L(+) tartrate+					1			1
I 4,[5],12:i:-			43	76	5			124
I 9,12:l,z28:-					1			1
I 28:i:-			1					1
I 47:z4,z23:-			1	1				2
II 58:l,z13,z28:z6				1				1
IIIa 40:z4,z23:-					1			1
IIIa 41:z4,z23:-			2	1				3
IIIa 48:z4,z24:-				1				1
IIIb 38:(k):z35		1						1
IIIb 42:(k):z35				1				1
IIIb 50:r:z				3				3
IIIb 53:z10:z35		1						1
IIIb 61:k:1,5,[7]				1				1
IIIb 61:l,[v],[z13]:1,5,[7]		1		1				2
IV 16:z4,z32:-			1					1
IV 44:z4,z32:-		1						1
IV 45:g,z51:-				1				1
IV 48:g,z51:-				1				1
IV 50:g,z51:-				1				1
IV 50:z4,z23:-				2				2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=West North Central

	States							
Serotype	**Iowa**	**Kansas**	**Minnesota**	**Missouri**	**Nebraska**	**North Dakota**	**South Dakota**	**Total**
Partially serotyped	7	25	7	4	3			46
Rough, mucoid, and/or nonmotile isolates			6	1	2			9
Unknown	3		13	1	32			49
Total	***394***	***279***	***795***	***861***	***196***	***53***	***150***	***2728***

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=South Atlantic

	States									
Serotype	Delaware	District of Columbia	Florida	Georgia	Maryland	North Carolina	South Carolina	Virginia	West Virginia	Total
Aberdeen					2					2
Abony				2					1	3
Adelaide			3	5	7			1		16
Agama								1		1
Agona	3		2	18	3	31	5	4	1	67
Alabama				3						3
Alachua				1		1				2
Albany					1					1
Anatum			3	13	3	5	3	3		30
Anatum var. 15+				2						2
Anecho						2				2
Aqua				1						1
Arechavaleta				1						1
Assinie				4						4
Avignon							1			1
Bahrenfeld								1		1
Baildon			1					1		2
Bardo				4	10					14
Bareilly				20	8	24	3	30	3	88
Benin					2					2
Bere				1		1	2			4
Berta	1		1	12	8	13	1	19	4	59
Blockley				3	5	1			1	10
Bovismorbificans				1		1	5	1		8
Bradford							1			1
Braenderup	1		11	31	8	17	8	9	4	89
Brandenburg				3	1	1	2	1		8
Brazil				2						2
Bredeney	1									1
Cannstatt				1						1
Caracas							1			1
Carrau						2				2
Cerro			2	1	1	1				5
Cerro var. 14+									1	1
Chandans				1						1
Chester			4			1		2		7
Choleraesuis						1				1
Corvallis				1				2		3
Cotham				1				1		2
Croft							1			1
Cubana	1				3					4
Daytona				2			1			3
Derby	1		4	5	1	1		5	1	18

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=South Atlantic

	States									
Serotype	**Delaware**	**District of Columbia**	**Florida**	**Georgia**	**Maryland**	**North Carolina**	**South Carolina**	**Virginia**	**West Virginia**	**Total**
Dublin			4							4
Durban								1		1
Duval							1			1
Ealing			1							1
Eastbourne								2	1	3
Emek								1		1
Entebbe				1						1
Enteritidis	19		44	172	265	233	92	225	32	1082
Farsta			1							1
Fischerkietz	1									1
Gaminara			4	6	1	8	5	2		26
Georgia					3					3
Give	1			1		4	11			17
Grumpensis				1						1
Hadar	1		1	11	7	1		7		28
Harburg									1	1
Harcourt			1							1
Hartford	1		6	16	1	6	6	2	2	40
Hato						2				2
Havana						4				4
Heidelberg	9		4	78	19	61	15	40	6	232
Herston			1							1
Hillegersberg							1			1
Hoghton				1						1
Hvittingfoss				1				2		3
Ibadan					1	1				2
Indiana						1	1			2
Infantis			5	24	10	7	3	26		75
Inverness			3	12		9	9			33
Irumu						3				3
Israel					1					1
Javiana	7		29	231	31	209	111	91	5	714
Johannesburg			3	1	1					5
Kedougou				2						2
Kentucky					1	1		1		3
Kiambu	2		2	1	1			1	1	8
Korlebu					1					1
Kortrijk									1	1
Kottbus				1				1		2
Larochelle					2					2
Litchfield	2			6	4	3	1	15	2	33
Livingstone								1		1
Loanda						2				2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=South Atlantic

	States									
Serotype	Delaware	District of Columbia	Florida	Georgia	Maryland	North Carolina	South Carolina	Virginia	West Virginia	Total
Lockleaze									2	2
Lomalinda	1									1
London						4				4
Luciana				1						1
Madelia				4			4	1		9
Manhattan			1	2		4	2	4	1	14
Matopeni									1	1
Mbandaka			1	9	2	9	3	5	2	31
Meleagridis			1	2				1		4
Menden				1						1
Miami			7	8	4	8	1	2		30
Mikawasima								1		1
Minnesota			2	1	2	2		4		11
Mississippi				129	2	85	57	3		276
Molade				1						1
Mono				2						2
Monschaui					1					1
Montevideo	2		2	138	9	16	32	15	8	222
Muenchen	1		7	105	6	59	61	13	2	254
Muenster			2	2	4	4		1		13
Nessziona					2		1			3
Neudorf								1		1
Newport	35		29	266	47	278	154	118	10	937
Nima			1	1						2
Norwich	1			11	1	1		2		16
Ohio	1			1	1	1		1		5
Oranienburg	2			20	15	39	5	21	2	104
Oranienburg var. 14+							1			1
Orion								1		1
Os				1						1
Oslo			1			1				2
Othmarschen			2						2	4
Pakistan				4	1					5
Panama	3		1	1	4			12		21
Paratyphi A			2	10	2	5		8		27
Paratyphi B				18	5		1	2	3	29
Paratyphi B var. L(+) tartrate+	2		3	4	1	26	2	1	2	41
Penarth					1					1
Pensacola				2			1	3		6
Pomona			5	6	1	2	1	1		16
Poona	1		3	8	2	2	2	6	1	25
Potsdam			1				1	2		4
Reading				2		3	1	1	1	8

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=South Atlantic

	States									
Serotype	**Delaware**	**District of Columbia**	**Florida**	**Georgia**	**Maryland**	**North Carolina**	**South Carolina**	**Virginia**	**West Virginia**	**Total**
Richmond								1		1
Rissen								1		1
Rubislaw			9	16		6	4	1		36
Saarbruecken					3					3
Saintpaul	4		9	42	7	19	25	16	1	123
Sandiego			11	11	4	11	6	7	1	51
Schwarzengrund	1		1	4	3		1	3		13
Senftenberg	1			4	1	2		3		11
Singapore			1							1
Stanley	2		1	2	4	7		2	2	20
Stanleyville					2					2
Suberu			1							1
Takoradi					2					2
Tallahassee				1			4		1	6
Telelkebir			2	1	4			4		11
Tennessee				17	2	9	4	17	3	52
Thompson	3		1	16	7	11	22	16	1	77
Tshiongwe					1					1
Typhi		1	9	4	16	4	1	27		62
Typhimurium	37		35	204	75	374	172	306	29	1232
Typhimurium var. 5-			19	128	38					185
Tyresoe				1						1
Uganda				4	1		1	3		9
Urbana			1	2	1			1		5
Virchow				5	2			2		9
Virginia				3	2					5
Weltevreden			7			1				8
Widemarsh				1						1
Wien					3					3
Worthington				3	1	2	1			7
I 3,10:e,h:-				1						1
I 4,[5],12:-:1,2				1	1					2
I 4,[5],12:b:-					4					4
I 4,[5],12:b:- var. L(+) tartrate+								3		3
I 4,[5],12:d:-								1		1
I 4,[5],12:i:-	6		23	10	34				6	79
I 4,[5],12:r:-					1					1
I 6,7:-:1,5					5					5
I 6,7:k:-					1					1
I 6,8:d:-			1							1
I 6,8:e,h:-					1					1
I 13,23:b:-					1					1
I 47:z4,z23:-	1				2					3

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=South Atlantic

	States									
Serotype	**Delaware**	**District of Columbia**	**Florida**	**Georgia**	**Maryland**	**North Carolina**	**South Carolina**	**Virginia**	**West Virginia**	**Total**
II 58:c:z6					1					1
IIIa 13,23:g,z51:-				1						1
IIIa 41:z4,z23:-			1							1
IIIa 48:g,z51:-				2						2
IIIa 50:z4,z32:-			2							2
IIIb 48:i:z			1							1
IV 40:z4,z24:-				1						1
IV 40:z4,z32:-								1		1
IV 43:z4,z23:-			1	2						3
IV 44:z4,z23:-				1	2					3
IV 45:g,z51:-				1	1					2
IV 48:g,z51:-			1							1
IV 48:z4,z32:-			2							2
IV 50:z4,z23:-			56							56
Partially serotyped	7	41	422	127	5	12	1	109	1	725
Rough, mucoid, and/or nonmotile isolates	1				2			1		4
Unknown	4		33		5	31	25	4		102
Total	***167***	***42***	***861***	***2081***	***770***	***1696***	***887***	***1258***	***149***	***7911***

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East South Central

	States				
Serotype	**Alabama**	**Kentucky**	**Mississippi**	**Tennessee**	**Total**
Aarhus	1		1		2
Adelaide	2	2		2	6
Agona	3	9	1	6	19
Alabama	1	1			2
Alachua	1				1
Anatum	3	2	1	18	24
Aqua				1	1
Banana			1		1
Bardo		2		1	3
Bareilly	15	16	5	17	53
Berta	3	11		8	22
Blockley	3				3
Bovismorbificans	1	3			4
Braenderup	24	14	3	6	47
Brandenburg	1				1
Brazil	1				1
Choleraesuis var. Kunzendorf			1		1
Colindale	1				1
Cubana		1			1
Daytona		1			1
Derby	3	1	1	2	7
Djugu			1		1
Durham	1				1
Ealing		1			1
Edinburg				1	1
Enteritidis	64	64	36	99	263
Gaminara	3		5		8
Garoli			1		1
Give	6	1	10	1	18
Haardt		1			1
Hadar			1	15	16
Hartford	7	5	1	9	22
Hato	1				1
Havana		1			1
Heidelberg	40	26	24	32	122
Hvittingfoss	1				1
Infantis	7	4		6	17
Inverness	7		2		9
Javiana	114	27	65	44	250
Kallo			1		1
Kentucky		2		1	3
Kingabwa				1	1
Kintambo	1				1
Kottbus				1	1
Litchfield	2	2	2	2	8

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East South Central

	States				
Serotype	**Alabama**	**Kentucky**	**Mississippi**	**Tennessee**	**Total**
London	1				1
Luciana		1			1
Manhattan		1	1	1	3
Mbandaka	12	6		11	29
Memphis	1				1
Miami		1		1	2
Mikawasima	1				1
Minnesota		1			1
Mississippi	45		98	15	158
Monschaui				1	1
Montevideo	57	13	18	10	98
Muenchen	59	9	27	11	106
Muenster				2	2
Newport	96	51	91	73	311
Nima				1	1
Norwich	4	5	10	8	27
Ohio		4			4
Ohio var. 14+				3	3
Okatie	1			1	2
Oranienburg	5	7	7	9	28
Orion		1			1
Oslo			1		1
Panama	2	2		1	5
Paratyphi A	1	1		2	4
Paratyphi B	2			15	17
Paratyphi B var. L(+) tartrate+	6	16	21	2	45
Pomona	1			1	2
Poona	7	2		4	13
Potsdam	1	1			2
Reading		1		1	2
Rissen		1			1
Roodepoort		4			4
Rubislaw	8	1	11	1	21
Saintpaul	14	17		8	39
Sandiego	4	1		1	6
Schleissheim	1	5			6
Schwarzengrund	3			1	4
Senftenberg	1	2	2	4	9
Shubra	2				2
Singapore		1			1
Stanley	5	7	1	1	14
Tallahassee	1			2	3
Telelkebir	1	1		2	4
Tennessee	10	10	1	10	31
Thompson	10	10	2	1	23

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=East South Central

	States				
Serotype	**Alabama**	**Kentucky**	**Mississippi**	**Tennessee**	**Total**
Typhi	2	4	2		8
Typhimurium	172	95	60	137	464
Typhimurium var. 5-		16	48	1	65
Uganda				1	1
Urbana			1		1
Virchow		1		2	3
Virginia	1				1
Worthington	1		3		4
I 4,[5],12:b:-	2				2
I 4,[5],12:d:-			1		1
I 4,[5],12:i:-	11		13		24
I 6,7:e,h:-			1		1
I 6,8:e,h:-			1		1
I 9,12:l,z28:-	2		1		3
I 13,22:z:-			1		1
I 13,23:b:-			1		1
II 35:l,z28:-			1		1
IV 48:g,z51:-	1				1
Partially serotyped		29	10	67	106
Unknown	75	26	10	597	708
Total	**946**	**551**	**608**	**1282**	**3387**

TABLE 4

Salmonella isolates from human sources
by serotype, geographic region and state, 2006

Region=West South Central

	States				
Serotype	**Arkansas**	**Louisiana**	**Oklahoma**	**Texas**	**Total**
Adelaide				2	2
Agona	3	8	1	2	14
Albany		1			1
Anatum	2	4	1	2	9
Arechavaleta			1		1
Bareilly	16	20	4	1	41
Berta	7	3	2		12
Bovismorbificans		1		1	2
Braenderup		22	13	3	38
Brandenburg		1	2	2	5
Bredeney		2			2
Chester		1			1
Choleraesuis				3	3
Colindale		2			2
Derby		2			2
Djugu			1		1
Dublin	1				1
Durham		1			1
Ealing			1		1
Enteritidis	45	31	35	49	160
Gaminara	2	13			15
Georgia	2				2
Give		24	2	2	28
Grumpensis	1				1
Hadar		3	3	1	7
Hartford		3	6		9
Havana		1			1
Heidelberg	19	14	13	4	50
Hvittingfoss		3	1		4
Infantis	4	10	5	9	28
Inverness		2			2
Javiana	69	54	11	16	150
Kentucky	1		1		2
Kiambu	1		4	2	7
Litchfield	4	9	7	1	21
Liverpool		1			1
London		3			3
Luciana		1			1
Manhattan		1			1
Mbandaka	7		2	4	13
Miami		1			1
Minnesota				1	1
Mississippi	17	70		15	102
Montevideo	9	75	8	14	106
Muenchen	4	26	5	6	41

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=West South Central

	States				
Serotype	**Arkansas**	**Louisiana**	**Oklahoma**	**Texas**	**Total**
Muenster				1	1
Newport	162	155	69	41	427
Norwich	24	6	10		40
Ohio	2				2
Oranienburg	9	10	10	11	40
Panama	1	1	1	2	5
Paratyphi A				1	1
Paratyphi B				2	2
Paratyphi B var. L(+) tartrate+			16		16
Poano			2		2
Pomona		2			2
Poona		3	1	3	7
Rubislaw	7	16	2	1	26
Saintpaul	2	4	3	5	14
Sandiego			1	1	2
Saphra		1			1
Schwarzengrund	2			2	4
Senftenberg	1	2	2	1	6
Singapore		2			2
Stanley	1			1	2
Telelkebir		1			1
Tennessee	6		1	9	16
Thompson	4	4	5	2	15
Typhi	2			2	4
Typhimurium	286	58	103	36	483
Uganda		1	4		5
Uppsala				1	1
Urbana		7			7
Virchow		1			1
Worthington	1	1		1	3
I 4,[5],12:-:1,2	1				1
I 4,[5],12:i:-		2			2
I 9,12:l,z28:-		1			1
Partially serotyped	4	53	12	208	277
Rough, mucoid, and/or nonmotile isolates		1			1
Unknown	48	254		2310	2612
Total	***777***	***999***	***371***	***2781***	***4928***

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mountain

	States							
Serotype	**Arizona**	**Colorado**	**Idaho**	**Montana**	**Nevada**	**New Mexico**	**Utah**	**Total**
Abony	1				1			2
Adelaide	1							1
Ago							1	1
Agona	34	7	3		3	6	2	55
Albany	1				1	1	5	8
Altona	1							1
Anatum	13	5	2				3	23
Anatum var. 15+		2						2
Bardo	1							1
Bareilly		1					1	2
Beaudesert					1			1
Benin		1						1
Berta		3			1	5		9
Blockley	2							2
Bovismorbificans	2						2	4
Braenderup	10	10	1		2	3	6	32
Brandenburg	4				1	3	1	9
Bredeney	3					2		5
California	2							2
Cerro	1	4	1			1		7
Chester	1							1
Chicago			1					1
Choleraesuis	1							1
Choleraesuis var. Kunzendorf					2		1	3
Colindale							1	1
Concord	1							1
Corvallis	2				1			3
Cotham	1				1			2
Cubana							1	1
Denver	1							1
Derby	1		2		2			5
Dublin	4				4		1	9
Eastbourne	1							1
Edinburg	1							1
Entebbe					1			1
Enteritidis	131	106	52		51	29	57	426
Fayed	1							1
Fluntern					1			1
Friedrichsfelde							1	1
Gaminara					1		2	3
Give	5						1	6
Grumpensis							3	3
Hadar	4	3			3		3	13
Hartford		1			1	1		3

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mountain

	States							
Serotype	**Arizona**	**Colorado**	**Idaho**	**Montana**	**Nevada**	**New Mexico**	**Utah**	**Total**
Havana		2						2
Heidelberg	21	35	14		13	5	10	98
Hofit		1						1
Hvittingfoss	1				1			2
Infantis	14	7	1		3	9	12	46
Inverness							1	1
Irumu		2						2
Javiana	2	9	4		3	28		46
Johannesburg	1							1
Jubilee		1						1
Kentucky	6	1	1					8
Kiambu	1				2		1	4
Kirkee		2						2
Korbol	1							1
Kottbus	3							3
Litchfield		2			2	1	2	7
Livingstone		1	1			1		3
Lomalinda		2				1		3
London	1							1
Manhattan	3							3
Mbandaka	5	1	3		1		7	17
Meleagridis		1					1	2
Menston						1		1
Miami							2	2
Michigan		1						1
Minnesota	6	3			1	1	4	15
Mississippi	1						3	4
Molade	1							1
Monschaui		1						1
Montevideo	53	31	1		11	21	10	127
Muenchen	27	6	5		3	6	5	52
Muenster		4	2		3		1	10
Newport	83	36	15		23	27	17	201
Ohio	1	1						2
Oranienburg	89	15			6	9	5	124
Oslo		1						1
Othmarschen	1							1
Overschie							1	1
Panama	44	1	1		4	7		57
Paratyphi A	1				1			2
Paratyphi B	3				3	2		8
Paratyphi B var. L(+) tartrate+	5	24	6		3		6	44
Pomona	15	2			3			20
Poona	44	3			1	4	2	54

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mountain

	States							
Serotype	**Arizona**	**Colorado**	**Idaho**	**Montana**	**Nevada**	**New Mexico**	**Utah**	**Total**
Reading	1	3	1			1		6
Remo	2							2
Rubislaw							1	1
Saintpaul	23	8	2		5	7	9	54
Sandiego	11	1			4	3	2	21
Sanjuan	1							1
Schwarzengrund	11	3			1		1	16
Senftenberg	7	2	2		4	2		17
Simi		2						2
Sinstorf		1						1
Stanley	8	5	2		2	1		18
Stanleyville	1							1
Sundsvall	3							3
Telelkebir	4	3	1				1	9
Tennessee	5	20			2	1		28
Thompson	9	6	2		20	1	4	42
Tshiongwe		2						2
Typhi	7	6	1		1	1	2	18
Typhimurium	116	92	20	1	24	26	91	370
Typhimurium var. 5-	6	32	10		3	23		74
Uganda			1		2		1	4
Umbilo		1						1
Virchow	1	3	1		1		1	7
Wandsworth							1	1
Waycross		1						1
Weltevreden	2						1	3
Worthington	1							1
I 4,[5],12:b:-	3							3
I 4,[5],12:b:- var. L(+) tartrate+	2							2
I 4,[5],12:i:-	45	2	6		7	7		67
I 6,14,25:-:l,z13,z28	1							1
I 6,8,20:z4,z24:-					1			1
I 9,12:g,z51:-	1							1
I 43:k:-							1	1
II 21:z10:[z6]	1							1
II 47:b:1,5		1					1	2
II 48:a:z6	1							1
II 50:b:z6	1							1
II 58:c:z6	1							1
II 58:l,z13,z28:z6	1							1
IIIa 18:z36:-	1							1
IIIa 21:z36:-	1							1
IIIa 40:z4,z24:-	1							1
IIIa 47:z4,z23:-	3							3

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Mountain

	States							
Serotype	**Arizona**	**Colorado**	**Idaho**	**Montana**	**Nevada**	**New Mexico**	**Utah**	**Total**
IIIa 48:z29:-					1			1
IIIb 48:i:-	1							1
IIIb 50:k:z	1							1
IIIb 50:r:z							2	2
IIIb 53:k:e,n,x,z15	1							1
IIIb 61:l,[v],[z13]:1,5,[7]		1						1
IV 6,7:z4,z24:-							1	1
IV 11:z4,z23:-	1							1
IV 16:z4,z32:-	1							1
IV 44:z4,z32:-		1						1
IV 45:g,z51:-		1						1
IV 48:g,z51:-	1	1						2
IV 50:g,z51:-			1				1	2
Partially serotyped	3	8		112	1	3	1	128
Rough, mucoid, and/or nonmotile isolates	13	2	2				2	19
Unknown	2	127				3		132
Total	**970**	**674**	**168**	**113**	**244**	**253**	**306**	**2728**

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Pacific

	States					
Serotype	**Alaska**	**California**	**Hawaii**	**Oregon**	**Washington**	**Total**
Abaetetuba		1				1
Aberdeen		1				1
Abony	1	1		1		3
Adelaide		18				18
Agbeni		6				6
Agona	1	114	3	8	7	133
Alachua		3				3
Albany		12	1			13
Altona		1				1
Amager			2	2		4
Anatum	1	26			3	30
Anatum var. 15+		8				8
Anecho		1				1
Apapa		1		1		2
Bardo		4	1		1	6
Bareilly		14		1		15
Barranquilla		1				1
Benin				1		1
Bere		1				1
Berta	1	19	1	2		23
Blockley		5			1	6
Bovismorbificans		7	1			8
Braenderup	1	80	1	11	6	99
Brandenburg		24	8		2	34
Bredeney		8				8
Buzu		1				1
Carrau		3			1	4
Cerro		10				10
Cerro var. 14+		1				1
Chester		11				11
Choleraesuis		1			1	2
Choleraesuis var. Kunzendorf		1				1
Coeln		2				2
Colindale		1		1		2
Concord		4				4
Corvallis		3	3			6
Cotham		2				2
Cubana		5				5
Dahlem		1				1
Dahra		1				1
Derby		33	9	2	1	45
Djakarta		1				1
Dublin		36		3	2	41
Duisburg		1				1
Durban		1	1			2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Pacific

	States					
Serotype	**Alaska**	**California**	**Hawaii**	**Oregon**	**Washington**	**Total**
Ealing		2			1	3
Eastbourne		3			1	4
Edinburg		3				3
Emek		1				1
Entebbe		1				1
Enteritidis	9	1259	34	79	94	1475
Florida		1				1
Gaminara	1	3			2	6
Gatuni		1				1
Georgia	1					1
Give		13	13		1	27
Give var. 15+		1				1
Glostrup		3				3
Grumpensis		1				1
Hadar		23	1	4	5	33
Hartford		10				10
Havana		13	1	1	1	16
Heidelberg	5	274	12	20	27	338
Hiduddify		1				1
Horsham		1				1
Hull		1				1
Hvittingfoss		10	1	3		14
Indiana		10			2	12
Infantis	1	97	4	7	6	115
Inganda		1				1
Irumu		1		1		2
Istanbul		1				1
Itami		1				1
Javiana		43	1	5	7	56
Johannesburg		7				7
Kedougou					1	1
Kentucky		25				25
Kiambu		11				11
Kingabwa				2		2
Kintambo		2				2
Kottbus		4				4
Lexington		1				1
Litchfield		36		2	3	41
Liverpool					1	1
Livingstone		3				3
Lomalinda	1	7		1	1	10
London		7	1	1		9
Manhattan		20				20
Mbandaka		44	4	3	3	54
Mbandaka var 14+		1				1

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Pacific

	States					
Serotype	**Alaska**	**California**	**Hawaii**	**Oregon**	**Washington**	**Total**
Meleagridis		4	2			6
Mgulani		1	1			2
Miami		6			1	7
Michigan		2				2
Minnesota		10				10
Mississippi		4				4
Molade				1		1
Monschaui		2		1		3
Montevideo		169	6	13	15	203
Muenchen		72	24	9	4	109
Muenster		12		2	1	15
Napoli		2				2
Newport	2	443	14	14	28	501
Nima		1				1
Nottingham				1		1
Offa		1				1
Ohio		8		5	1	14
Ohio var. 14+		1				1
Onderstepoort		1				1
Oranienburg		93	5	5	8	111
Orion		2				2
Oslo	1	6	3		2	12
Othmarschen		1				1
Ouakam		3				3
Overschie		1				1
Pakistan		1				1
Panama	2	33	3	1	2	41
Paratyphi A	1	46		5	2	54
Paratyphi B	1	8		2	6	17
Paratyphi B var. L(+) tartrate+		67	2	7	4	80
Plymouth		2				2
Pomona		8				8
Poona	2	37		4	5	48
Portland					1	1
Potsdam		10	2			12
Reading	1	9		1		11
Rissen		9			1	10
Roodepoort		3				3
Rubislaw		1				1
Saintpaul	1	82	3	10	4	100
Salford		1				1
Sandiego	1	13			3	17
Schwarzengrund	2	22		1	1	26
Senftenberg	1	32	2	2		37
Singapore		2				2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Pacific

	States					
Serotype	**Alaska**	**California**	**Hawaii**	**Oregon**	**Washington**	**Total**
Soerenga		1			1	2
Stanley	4	110	5	10	7	136
Telelkebir		15				15
Tennessee	1	11		2	6	20
Thompson		37	1	8	6	52
Tilene		1				1
Toucra					1	1
Typhi		89	4	4	5	102
Typhimurium	10	555	63	88	56	772
Typhimurium var. 5-		218	1			219
Uganda		11			2	13
Urbana		7				7
Vinohrady		1				1
Virchow		15		2	3	20
Virginia		3	1			4
Wandsworth		2				2
Weltevreden		15	29	1	2	47
Weltevreden var. 15+		1	2		1	4
Westhampton	2			1		3
Worthington		5		1		6
Yoruba			1			1
I 3,10:e,h:-		1				1
I 3,10:l,v:-		1				1
I 4,[5],12:-:1,2		2				2
I 4,[5],12:b:-		29				29
I 4,[5],12:b:- var. L(+) tartrate+				2		2
I 4,[5],12:e,h:-		1				1
I 4,[5],12:i:-	7	205	5	21	22	260
I 6,14,25:b:-					1	1
I 6,7:-:1,5		2				2
I 6,7:c:-		1				1
I 6,7:e,h:-		1				1
I 6,7:k:-		11				11
I 9,12:-:1,5		3				3
I 9,12:l,z28:-		1		1		2
I 13,23:b:-		2				2
I 43:k:-		2				2
I 47:z4,z23:-		1				1
II 30:l,z28:z6		1				1
IIIa 18:z4,z23:-		14	2		2	18
IIIa 18:z4,z32:-		1				1
IIIa 21:g,z51:-		2				2
IIIa 41:z4,z23:-		5				5
IIIa 42:z4,z23:-		1				1
IIIa 44:z4,z24:-		2				2

TABLE 4

Salmonella isolates from human sources by serotype, geographic region and state, 2006

Region=Pacific

	States					
Serotype	**Alaska**	**California**	**Hawaii**	**Oregon**	**Washington**	**Total**
IIIa 48:g,z51:-		4				4
IIIa 48:z36:-		1				1
IIIa 48:z4,z24:-		2				2
IIIa 51:z4,z23:-		1				1
IIIa 53:z4,z23:-		5				5
IIIa 56:z4,z23:-		1				1
IIIa 63:z4,z23:-		2				2
IIIb 11:l,[v],[z13]:z53		1				1
IIIb 35:i:z				1		1
IIIb 35:r:e,n,x,z15		1				1
IIIb 48:-:z35		1				1
IIIb 48:i:z		3				3
IIIb 50:k:z53		2				2
IIIb 50:r:z		3		1		4
IIIb 50:z52:z35		1				1
IIIb 60:r:e,n,x,z15		3			1	4
IIIb 60:z52:z53		1				1
IIIb 61:c:z35		1				1
IIIb 61:i:z53		1				1
IIIb 61:k:1,5,[7]		1				1
IIIb 61:l,[v],[z13]:1,5,[7]		7				7
IIIb 61:z52:z53					1	1
IIIb 65:z10:e,n,x,z15		2				2
IV 11:z4,z23:-		1				1
IV 16:z4,z32:-		3				3
IV 44:z4,z23:-		4				4
IV 44:z4,z32:-		2				2
IV 45:g,z51:-		1			1	2
IV 48:g,z51:-		1		1		2
IV 50:g,z51:-		4			1	5
IV 50:z4,z23:-		3				3
Partially serotyped	4	3	2		2	11
Rough, mucoid, and/or nonmotile isolates	1	36	1	6	2	46
Unknown		10	1	9		20
Total	**67**	**5151**	**288**	**405**	**393**	**6304**

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Aarhus		4				2				6
Aba	1									1
Abaetetuba	1		1						1	3
Aberdeen		5		2	2				1	10
Abony					3			2	3	8
Adelaide	4	11	9	3	16	6	2	1	18	70
Agama		3			1					4
Agbeni		3	5	1					6	15
Ago								1		1
Agona	43	91	68	48	67	19	14	55	133	538
Agoueve	1		2							3
Ajiobo			1							1
Alabama					3	2				5
Alachua	2	9	1		2	1			3	18
Albany	1	9		3	1		1	8	13	36
Altona		1		1				1	1	4
Amager									4	4
Amherstiana				1						1
Amoutive				1						1
Amsterdam		1	1	1						3
Amsterdam var. 15+				1						1
Anatum	16	32	42	32	30	24	9	23	30	238
Anatum var. 15+		1	2	1	2			2	8	16
Anecho					2				1	3
Anfo		1								1
Apapa	2	1	1	1					2	7
Aqua				1	1	1				3
Arechavaleta					1		1			2
Assinie					4					4
Avignon					1					1
Bahrenfeld					1					1
Baildon		9	3		2					14
Banana						1				1
Bardo		1		4	14	3		1	6	29
Bareilly	4	15	12	26	88	53	41	2	15	256
Bargny			1							1
Barranquilla			2	2					1	5
Beaudesert		1	1					1		3
Benin	1	1			2			1	1	6
Bere		2			4				1	7
Bergen				1						1
Berta	17	55	39	16	59	22	12	9	23	252
Blockley	11	21	6	2	10	3		2	6	61
Bonariensis	2									2
Bonn			1							1

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Bournemouth		1								1
Bousso		1								1
Bovismorbificans	3	15	19	8	8	4	2	4	8	71
Bradford					1					1
Braenderup	35	107	81	33	89	47	38	32	99	561
Brandenburg	2	10	15	10	8	1	5	9	34	94
Brazil					2	1				3
Brazzaville		3								3
Bredeney	2	3	3	3	1		2	5	8	27
Bron		1								1
Buzu			1						1	2
California								2		2
Cannstatt					1					1
Caracas					1					1
Carmel	1									1
Carrau	2		2		2				4	10
Cerro	1	4	2	4	5			7	10	33
Cerro var. 14+					1				1	2
Chandans					1					1
Chester	1	3	5		7		1	1	11	29
Chicago								1		1
Chincol			1							1
Choleraesuis	2	1	1	1	1		3	1	2	12
Choleraesuis var. Kunzendorf	1	3	1	1		1		3	1	11
Clackamas		1								1
Claibornei		1								1
Coeln		1		1					2	4
Colindale	2	4	1			1	2	1	2	13
Concord	3	4	2	3				1	4	17
Corvallis		3	7	1	3			3	6	23
Cotham		3	3		2			2	2	12
Croft					1					1
Cubana		5	1		4	1		1	5	17
Cuckmere		1								1
Dahlem									1	1
Dahra				1					1	2
Daytona	1				3	1				5
Denver								1		1
Derby	2	26	24	10	18	7	2	5	45	139
Djakarta									1	1
Djugu						1	1			2
Doorn		1								1
Dublin	6	20	3	4	4		1	9	41	88
Duisburg									1	1
Durban	3	2	3		1				2	11

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Durham		1	1			1	1			4
Duval					1					1
Ealing	1	2	2	1	1	1	1		3	12
Eastbourne	4	2	1	1	3			1	4	16
Edinburg		9	2	1		1		1	3	17
Emek			1		1				1	3
Entebbe					1			1	1	3
Enteritidis	482	1679	707	466	1082	263	160	426	1475	6740
Eppendorf		1		1						2
Essen			1							1
Farsta					1					1
Fayed								1		1
Fischerkietz					1					1
Florida		2							1	3
Fluntern	2							1		3
Friedenau		1								1
Friedrichsfelde								1		1
Frintrop		1								1
Fyris		2								2
Gaminara	7	4	4	4	26	8	15	3	6	77
Garoli						1				1
Gatuni		1							1	2
Georgia					3		2		1	6
Give	4	11	10	2	17	18	28	6	27	123
Give var. 15+									1	1
Glostrup		2							3	5
Grandhaven		1								1
Grumpensis		2	1		1		1	3	1	9
Guinea				1						1
Gwale		1								1
Haardt		4				1				5
Hadar	42	87	29	20	28	16	7	13	33	275
Haifa			5							5
Harburg					1					1
Harcourt					1					1
Hartford	13	34	40	28	40	22	9	3	10	199
Hato			1		2	1				4
Havana	5	3	2	3	4	1	1	2	16	37
Heidelberg	85	325	142	103	232	122	50	98	338	1495
Herston				1	1					2
Hiduddify									1	1
Hillegersberg					1					1
Hindmarsh		1	2	2						5
Hofit	1							1		2
Hoghton					1					1

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Holcomb		1	2							3
Horsham									1	1
Hull			2						1	3
Hvittingfoss	2	17	1	1	3	1	4	2	14	45
Ibadan		1			2					3
Indiana	4	7	2	1	2				12	28
Infantis	31	76	51	52	75	17	28	46	115	491
Inganda									1	1
Inverness		2	2		33	9	2	1		49
Irumu		1		1	3			2	2	9
Isangi		1								1
Israel					1					1
Istanbul	1	6							1	8
Itami									1	1
Ituri		1								1
Javiana	37	107	49	24	714	250	150	46	56	1433
Jerusalem		1								1
Johannesburg	1	6	2		5			1	7	22
Jubilee								1		1
Jukestown		1								1
Kalamu		1								1
Kallo						1				1
Kapemba		1								1
Kedougou		1			2				1	4
Kentucky	8	60	12	2	3	3	2	8	25	123
Kiambu	7	10	13	5	8		7	4	11	65
Kimuenza		1								1
Kingabwa	1					1			2	4
Kintambo		6	5	1		1			2	15
Kirkee								2		2
Kisangani			1							1
Kivu				1						1
Kokomlemle		2								2
Korbol								1		1
Korlebu					1					1
Kortrijk					1					1
Kottbus	1	1	1	2	2	1		3	4	15
Lagos		1								1
Larochelle					2					2
Lexington									1	1
Lexington var. 15+		1								1
Limete			1							1
Lindenburg		3								3
Litchfield	22	41	16	13	33	8	21	7	41	202
Liverpool							1		1	2

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Livingstone		2			1			3	3	9
Loanda					2					2
Lockleaze					2					2
Lomalinda	2		3	1	1			3	10	20
London	1	7	4	7	4	1	3	1	9	37
Luciana					1	1	1			3
Madelia		1		1	9					11
Manhattan	12	11	9	6	14	3	1	3	20	79
Matopeni		2			1					3
Mbandaka	9	33	47	7	31	29	13	17	54	240
Mbandaka var 14+									1	1
Meleagridis	1	1	3	3	4			2	6	20
Memphis						1				1
Menden					1					1
Menston								1		1
Mgulani									2	2
Miami	5	8	3	6	30	2	1	2	7	64
Michigan		1						1	2	4
Mikawasima		4			1	1				6
Minnesota	6	2	6	5	11	1	1	15	10	57
Mississippi	16	24	8	12	276	158	102	4	4	604
Molade					1			1	1	3
Mono				29	2					31
Monschaui	1		3		1	1		1	3	10
Montevideo	50	104	76	75	222	98	106	127	203	1061
Mornington		1								1
Moscow		1								1
Muenchen	19	78	56	38	254	106	41	52	109	753
Muenster	8	23	11	13	13	2	1	10	15	96
Nagoya	1									1
Napoli		1							2	3
Nchanga		1								1
Nessziona					3					3
Neudorf					1					1
Newmexico	1	1								2
Newport	120	390	261	225	937	311	427	201	501	3373
Nima		7	1	3	2	1			1	15
Norwich	2	7	4	23	16	27	40			119
Nottingham		1							1	2
Offa									1	1
Ohio	4	15	12	4	5	4	2	2	14	62
Ohio var. 14+			2			3			1	6
Okatie						2				2
Onderstepoort									1	1
Oranienburg	85	108	84	35	104	28	40	124	111	719

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Oranienburg var. 14+	6	1	1		1					9
Orion				1	1	1			2	5
Oritamerin		1								1
Os					1					1
Oslo	3	3	1		2	1		1	12	23
Othmarschen		3	1	1	4			1	1	11
Ouakam		1							3	4
Overschie	1							1	1	3
Oxford var. 15+, 34+			1							1
Pakistan					5				1	6
Panama	14	34	6	16	21	5	5	57	41	199
Paratyphi A	14	54	19	7	27	4	1	2	54	182
Paratyphi B	5	21	25	14	29	17	2	8	17	138
Paratyphi B var. L(+) tartrate+	26	65	49	51	41	45	16	44	80	417
Paratyphi C		1								1
Penarth					1					1
Pensacola	1	6			6					13
Plymouth									2	2
Poano			1	2			2			5
Pomona	6	24	9	4	16	2	2	20	8	91
Poona	4	26	17	10	25	13	7	54	48	204
Portland				1					1	2
Potsdam					4	2			12	18
Powell		1								1
Praha		1								1
Presov		1								1
Putten			2							2
Reading	6	8	5	5	8	2		6	11	51
Redlands		1								1
Remo								2		2
Richmond	3	2	1	2	1					9
Rissen		2	1	3	1	1			10	18
Romanby		1								1
Roodepoort	1	1				4			3	9
Rovaniemi		1								1
Rubislaw	5	3	1	2	36	21	26	1	1	96
Saarbruecken					3					3
Saintpaul	41	111	68	38	123	39	14	54	100	588
Salford									1	1
Sandiego	31	59	18	16	51	6	2	21	17	221
Sanjuan								1		1
Sanktgeorg		2								2
Saphra							1			1
Schleissheim						6				6
Schwarzengrund	21	63	20	7	13	4	4	16	26	174

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Senftenberg	4	15	7	7	11	9	6	17	37	113
Shubra			1			2				3
Simi								2		2
Singapore			1		1	1	2		2	7
Sinstorf								1		1
Soerenga	1								2	3
Somone		1								1
Stanley	15	63	33	14	20	14	2	18	136	315
Stanleyville		1		1	2			1		5
Suberu					1					1
Suelldorf		1								1
Sundsvall								3		3
Takoradi			1		2					3
Tallahassee			2		6	3				11
Tamberma			1							1
Tanzania				1						1
Telelkebir	1	6	5	1	11	4	1	9	15	53
Tennessee	12	72	49	32	52	31	16	28	20	312
Thompson	31	101	52	54	77	23	15	42	52	447
Tilene									1	1
Tornow		1								1
Toucra									1	1
Treguier		1								1
Tshiongwe					1			2		3
Typhi	27	149	35	8	62	8	4	18	102	413
Typhimurium	360	1043	600	593	1232	464	483	370	772	5917
Typhimurium var. 5-	76	142	96	98	185	65		74	219	955
Tyresoe					1					1
Uganda	4	11	10	2	9	1	5	4	13	59
Umbilo								1		1
Uppsala							1			1
Urbana	2	4	6	4	5	1	7		7	36
Uzaramo	1	1								2
Vinohrady									1	1
Virchow	5	16	9	10	9	3	1	7	20	80
Virginia		2		1	5	1			4	13
Wandsworth		2		2				1	2	7
Waycross		1						1		2
Weltevreden	8	11	14		8			3	47	91
Weltevreden var. 15+									4	4
Westhampton									3	3
Widemarsh		1			1					2
Wien					3					3
Worthington	1	4	4	3	7	4	3	1	6	33
Yoruba									1	1

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
Zwickau		1								1
I 3,10:e,h:-					1				1	2
I 3,10:l,v:-	1								1	2
I 3,10:r:-				3						3
I 4,[5],12:-:1,2	1	6	3		2		1		2	15
I 4,[5],12:b:-	2	19	10	1	4	2		3	29	70
I 4,[5],12:b:- var. L(+) tartrate+			19	1	3			2	2	27
I 4,[5],12:d:-		1			1	1				3
I 4,[5],12:e,h:-	3	1							1	5
I 4,[5],12:i:-	116	204	324	124	79	24	2	67	260	1200
I 4,[5],12:r:-					1					1
I 6,14,25:-:l,z13,z28								1		1
I 6,14,25:b:-									1	1
I 6,7:-:1,5	1	5	2		5				2	15
I 6,7:c:-									1	1
I 6,7:e,h:-						1			1	2
I 6,7:i:-		1								1
I 6,7:k:-	1	4			1				11	17
I 6,7:l,w:-		1								1
I 6,7:r:-			2							2
I 6,8,20:z4,z24:-								1		1
I 6,8:-:1,2		1								1
I 6,8:d:-					1					1
I 6,8:e,h:-					1	1				2
I 9,12:-:1,5									3	3
I 9,12:g,z51:-								1		1
I 9,12:l,v:-	1	1								2
I 9,12:l,z28:-	1		1	1		3	1		2	9
I 11:z10:-	1									1
I 13,22:z:-						1				1
I 13,23:b:-					1	1			2	4
I 28:i:-				1						1
I 43:k:-								1	2	3
I 45:b:-			2							2
I 47:z4,z23:-	2	5		2	3				1	13
II 6,7:z:1,5		1								1
II 21:z10:[z6]								1		1
II 30:l,z28:z6									1	1
II 35:l,z28:-						1				1
II 40:z39:1,7		1								1
II 47:b:1,5								2		2
II 47:b:e,n,x,z15			1							1
II 48:a:z6								1		1
II 48:d:z6			2							2
II 50:b:z6	1							1		2

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Total
II 58:c:z6					1			1		2
II 58:l,z13,z28:z6				1				1		2
IIIa 13,22:z4,z23:-			1							1
IIIa 13,23:g,z51:-					1					1
IIIa 18:z36:-								1		1
IIIa 18:z4,z23:-			1						18	19
IIIa 18:z4,z32:-									1	1
IIIa 21:g,z51:-									2	2
IIIa 21:z36:-								1		1
IIIa 35:z4,z23:-	1									1
IIIa 40:z4,z23:-		1		1						2
IIIa 40:z4,z24:-								1		1
IIIa 41:z4,z23:-	1		1	3	1				5	11
IIIa 42:z4,z23:-									1	1
IIIa 44:z4,z24:-									2	2
IIIa 47:z4,z23:-								3		3
IIIa 48:g,z51:-					2				4	6
IIIa 48:z29:-								1		1
IIIa 48:z36:-									1	1
IIIa 48:z4,z24:-			1	1					2	4
IIIa 50:z4,z32:-					2					2
IIIa 51:z4,z23:-									1	1
IIIa 53:z4,z23:-									5	5
IIIa 56:z4,z23:-									1	1
IIIa 63:z4,z23:-									2	2
IIIb 11:l,[v],[z13]:z53									1	1
IIIb 35:i:z									1	1
IIIb 35:k:e,n,x,z15			1							1
IIIb 35:r:e,n,x,z15									1	1
IIIb 38:(k):-			1							1
IIIb 38:(k):z35				1						1
IIIb 42:(k):z35				1						1
IIIb 47:k:z35			1							1
IIIb 48:-:z35									1	1
IIIb 48:i:-								1		1
IIIb 48:i:z			4		1				3	8
IIIb 50:k:z								1		1
IIIb 50:k:z53									2	2
IIIb 50:r:z		1		3				2	4	10
IIIb 50:z52:z35									1	1
IIIb 53:k:e,n,x,z15								1		1
IIIb 53:z10:z35				1						1
IIIb 60:r:e,n,x,z15									4	4
IIIb 60:z52:z53		1							1	2
IIIb 61:c:z35									1	1

TABLE 5

Salmonella isolates from human sources by serotype and geographic region, 2006

	Region									
Serotype	**New England**	**Mid Atlantic**	**East North Central**	**West North Central**	**South Atlantic**	**East South Central**	**West South Central**	**Mountain**	**Pacific**	**Total**
IIIb 61:i:z53									1	1
IIIb 61:k:1,5,[7]				1					1	2
IIIb 61:l,[v],[z13]:1,5,[7]		1		2				1	7	11
IIIb 61:z52:z53	2	1							1	4
IIIb 65:z10:e,n,x,z15									2	2
IV 6,7:z4,z24:-								1		1
IV 11:z4,z23:-			1					1	1	3
IV 16:z4,z32:-		2		1				1	3	7
IV 40:z4,z24:-					1					1
IV 40:z4,z32:-					1					1
IV 43:z4,z23:-		1			3					4
IV 44:z4,z23:-	1	1	2		3				4	11
IV 44:z4,z32:-		2	1	1				1	2	7
IV 45:g,z51:-		1		1	2			1	2	7
IV 48:g,z51:-	2	1	1	1	1	1		2	2	11
IV 48:z4,z32:-	1				2					3
IV 50:g,z51:-	3	4	1	1				2	5	16
IV 50:z4,z23:-	1		2	2	56				3	64
IV 50:z4,z32:-	1	1								2
Partially serotyped	6	56	93	46	725	106	277	128	11	1448
Rough, mucoid, and/or nonmotile isolates	11	6	14	9	4		1	19	46	110
Unknown	126	79	214	49	102	708	2612	132	20	4042
Total	***2300***	***6425***	***3955***	***2728***	***7911***	***3387***	***4928***	***2728***	***6304***	***40666***

TABLE 6

Clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Clinical Nonhuman Source									
Serotype	All Others	Bovine	Chicken	Equine	Other birds / Wild animals	Other Domestic Animals /Environment	Porcine	Reptile	Turkey	Total
Adelaide							1	1		2
Agbeni							1			1
Agona	1	239	2	43	22	18	117	1	12	455
Agoueve								1		1
Alachua		1					5			6
Albany									8	8
Amsterdam		1								1
Anatum	3	210	3	21	7	3	53		15	315
Anatum var. 15+		25	2	4	2		6		1	40
Anatum var. 15+,34+		11					1			12
Bardo	1	8								9
Bareilly		3		5		3	2			13
Barranquilla		1								1
Bere		1								1
Berta		2			1		1		8	12
Bovismorbificans		31		5		1	4			41
Braenderup	1	8	1	25	4		8	1		48
Brandenburg		13		1		2	31		1	48
Bredeney		22			3	1	7	1	12	46
California							1			1
Cannstatt				3						3
Carmel	2									2
Carrau				2						2
Cerro		155				1	2		1	159
Cholerasuis var. Kunzendorf	1					1	155			157
Cotham					1					1
Cubana		1					4			5
Derby		12			1	1	287		1	302
Dublin	5	335	2	3	1	7	5			358
Duisburg		1								1
Ealing					1					1
Edinburg						7				7
Enteritidis	1	8	26	4	13	6	8		1	67
Falkensee					2					2
Fresno		3						3		6
Gallinarum			5		1					6
Gaminara				1			2			3
Give	1	58		5	2	5	4	1		76
Give var. 15+		15		4						19
Give var. 15+,34+		12				8				20
Hadar		4	9		12	2			16	43
Hannover					1					1
Hartford		2	1	7	5					15

TABLE 6

Clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Clinical Nonhuman Source									
Serotype	**All Others**	**Bovine**	**Chicken**	**Equine**	**Other birds / Wild animals**	**Other Domestic Animals /Environment**	**Porcine**	**Reptile**	**Turkey**	**Total**
Havana		6				1	17		2	26
Heidelberg	4	20	21	1	30	2	162		24	264
Holcomb		2								2
Hvittingfoss					2			1		3
Indiana					2					2
Infantis	3	41	3	24	5	5	75	2	1	159
Inverness				2						2
Javiana	1		1	31						33
Johannesburg		4	2	1		3	30		3	43
Kentucky	1	164	30	4	8	3	1		2	213
Kiambu		1		2	2		1			6
Kinondoni								1		1
Kisarawe								1		1
Kpeme								1		1
Krefeld							5			5
Lexington var. 15+		2								2
Lille		6								6
Litchfield		3		27			2	2		34
Liverpool					1					1
Livingstone	2	1	1		1		4			9
Lomalinda					1					1
Lomita		1								1
London		4		1			21			26
London var. 15+		1		1			1			3
Luciana				1						1
Manhattan		2					2			4
Mbandaka	2	98	3	9	6	27	26		1	172
Meleagridis	5	68		15	2	7	1			98
Miami				2		1				3
Minnesota		19		2		2				23
Mississippi				8	2					10
Montevideo	1	293		4	18	16	3	2	19	356
Muenchen		23		16	6	1	21	6		73
Muenster		163	1	5	2	2	9	1	6	189
Muenster var. 15+							1		1	2
Muenster var. 15+,34+	1	3		1						5
Newport	6	436		90	42	51	20	3		648
Norwich		1		1	1	1				4
Ohio		23	2	1	4		41			71
Oranienburg	1	4	1	20	3		14	3		46
Orion			1		1				1	3
Orion var 15+		20			1		1			22
Orion var. 15+,34+		365								365

TABLE 6

Clinical Salmonella isolates from nonhuman sources Reported to CDC and NSVL by serotype and source, 2006

	Clinical Nonhuman Source									
Serotype	All Others	Bovine	Chicken	Equine	Other birds / Wild animals	Other Domestic Animals /Environment	Porcine	Reptile	Turkey	Total
Oslo								1		1
Ouakam			1	2				1		4
Panama		1		1				3		5
Paratyphi B var. L(+) tartrate+		3		23	2	2		4		34
Pomona		1								1
Poona		1						1		2
Putten		1				1	3			5
Reading	1	83		8	8	3	1			104
Rissen		2					2			4
Rubislaw		1		9	3					13
Saintpaul	1	7		11	7		8		5	39
Sandiego		2						1		3
Schwarzengrund		9	2	1		2	14		1	29
Senftenberg	2	62	7	6	12	8	57	1	77	232
Soerenga		1					18			19
Sundsvall		2								2
Taksony					1					1
Tennessee		2			2	1	3		1	9
Thompson	1	19	1	20	5	3	5	1		55
Typhimurium	15	264	18	223	50	18	269		3	860
Typhimurium var. 5-	14	161	5	35	27	19	469		2	732
Uganda	1	53		9	3	3	13			82
Uganda var. 15+		1					2			3
Urbana				7			2	1		10
Wandsworth					1					1
Woodinville								1		1
Worthington	1	11	1	1	3		46		6	69
I 3,10:-:1,6		2					1			3
I 3,10:e,h:-	2	4								6
I 3,10:l,z13:-		2								2
I 3,15:e,h:-		1								1
I 4,[5],12:-:1,2							2			2
I 4,[5],12:d:-	1		1							2
I 4,[5],12:i:-	3	80	4	45	9	10	36	1		188
I 4,[5],12:r:-							1			1
I 4,[5]v,12:i:-		1								1
I 6,7:-:1,5	1	2		2			3			8
I 6,7:-:l,w		1					2			3
I 6,7:k:-			1							1
I 6,7:r:-				3						3
I 6,7:z10:-				1						1
I 6,8:-:1,2	1	1								2
I 6,8:e,h:-							1			1

TABLE 6

Clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Clinical Nonhuman Source									
Serotype	All Others	Bovine	Chicken	Equine	Other birds / Wild animals	Other Domestic Animals /Environment	Porcine	Reptile	Turkey	Total
I 8,20:-:z6				1						1
I 8,20:i:-					1					1
II 42:b:e,n,x,z15					1					1
II 58:c:z6								1		1
II 58:l,z13,z28:z6	1				1			1		3
IIIa 18:z4,z23:-								3		3
IIIa 18:z4,z32:-								2	5	7
IIIa 40:z4,z32:-								1		1
IIIa 41:z4,z23:-				1				5		6
IIIa 42:z4,z24:-								1		1
IIIa 44:z4,z23:-								5		5
IIIa 48:g,z51:-								3		3
IIIa 48:z4,z24:-								1		1
IIIa 51:z4,z23:-								2		2
IIIb (6),14:z10:z								2		2
IIIb 35:l,v:z35					1			1		2
IIIb 35:r:e,n,x,z15								1		1
IIIb 38:(k):z35								2		2
IIIb 38:k:z								1		1
IIIb 38:l,v:z53								1		1
IIIb 43:r:z53								1		1
IIIb 47:i:z53								1		1
IIIb 47:k:z35								1		1
IIIb 48:k:1,5,7								1		1
IIIb 48:l,v:1,5								1		1
IIIb 50:(k):z								1		1
IIIb 50:k:e,n,x,z15								1		1
IIIb 50:k:z						1		3		4
IIIb 50:r:z								4		4
IIIb 50:z52:z53								1		1
IIIb 52:z:z52								1		1
IIIb 58:r:z53								3		3
IIIb 60:r:z		1								1
IIIb 61:-:1,5,7	1			2		22				25
IIIb 61:c:z35		1			1			1		3
IIIb 61:i:z								1		1
IIIb 61:l,v:1,5,7								1		1
IIIb 65:z10:e,n,x,z15								1		1
IIIb 65:z52:z								1		1
IIal 44:z4,z23:-								1		1
IV 43:z4,z23:-					1			2		3
IV 43:z4,z32:-					1			1		2
IV 44:z4,z23:-								1		1

TABLE 6

Clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Clinical Nonhuman Source									
Serotype	**All Others**	**Bovine**	**Chicken**	**Equine**	**Other birds / Wild animals**	**Other Domestic Animals /Environment**	**Porcine**	**Reptile**	**Turkey**	**Total**
IV 44:z4,z32:-								1		1
IV 48:g,z51:-								2		2
IV 50:g,z51:-					1			3		4
Rough, mucoid, and/or nonmotile isolates		31		5	4		59	2		101
Total	**89**	**3770**	**158**	**818**	**364**	**281**	**2180**	**118**	**236**	**8014**

TABLE 7

Non-clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Non-clinical Nonhuman Source										
Serotype	All Others	Bovine	Chicken	Equine	Feed/Feed Supplements	Other birds / Wild animals	Other Domestic Animals /Environment	Porcine	Reptile	Turkey	Total
Abaetetuba										1	1
Adelaide			2								2
Agona	2	27	50	1		2	24	37		61	204
Alabama			5								5
Alachua			30				2			1	33
Albany										11	11
Altona			1								1
Amager			1								1
Amsterdam var. 15+			3								3
Anatum	4	102	28	2	1		8	17	1	16	179
Anatum var. 15+	1	4					1				6
Anatum var. 15+,34+	5		1								6
Aqua									1		1
Arechavaleta										2	2
Bardo		8								3	11
Bareilly	1	9	32	1		1	6				50
Barranquilla			1			4					5
Bere							2				2
Berta		1	17				1			9	28
Bovismorbificans			1					2		1	4
Braenderup		1	65	1		8	4				79
Brandenburg		2						2		3	7
Bredeney		2	10			5		2		18	37
California			1								1
Cerro	9	210	19				1				239
Cholerasuis var. Kunzendorf								2		1	3
Cubana			34								34
Denver							3				3
Derby	1	27	3					79		19	129
Dublin	1	14					1	1			17
Enteritidis	8	4	185			6	5			14	222
Falkensee			2								2
Gaminara							6				6
Give		81	3				21		1		106
Give var. 15+		1	1								2
Godesberg			8								8
Hadar	2	5	7			2	2	1	1	418	438
Hannover							1				1
Hartford	1	49	1				37		1		89
Havana			18				2	3			23
Heidelberg	5	5	592			18	27	2		125	774
Indiana			8			9					17
Infantis		10	38				9	2		2	61

TABLE 7

Non-clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Non-clinical Nonhuman Source										
Serotype	**All Others**	**Bovine**	**Chicken**	**Equine**	**Feed/Feed Supplements**	**Other birds / Wild animals**	**Other Domestic Animals /Environment**	**Porcine**	**Reptile**	**Turkey**	**Total**
Inverness							1				1
Istanbul										3	3
Javiana			6			3	4			11	24
Johannesburg			10					15		1	26
Kentucky	7	37	630	1		21	20	1	1	14	732
Kiambu			11				5				16
Kralingen			2								2
Krefeld										1	1
Lexington var. 15+		2									2
Lille			13			1	2			1	17
Litchfield		1	5								6
Liverpool			3								3
Livingstone			16					1			17
Lockleaze										1	1
London		1	1				1			39	42
London var. 15+										1	1
Luciana							2		1		3
Manhattan	1						1				2
Mbandaka	2	3	105			3	4	4		16	137
Meleagridis		5	3								8
Miami				1							1
Minnesota			8				2				10
Mississippi							1				1
Molade			2								2
Montevideo	3	27	94	1		4	10	1		20	160
Muenchen		14	22	1			39	2		17	95
Muenster	4	3	3				4			71	85
Muenster var. 15+										3	3
Muenster var. 15+,34+										2	2
Newport	7	41	24	1			27	1	1	56	158
Nima	3		2				1				6
Norwich			4								4
Ohio			14			1	1	3		1	20
Oranienburg	2	86	22	3	1		4		1	1	120
Orion			14				1			15	30
Orion var 15+			3			1				3	7
Orion var. 15+,34+	2		6							1	9
Ouakam			7							2	9
Paratyphi B var. L(+) tartrate+	2			1			12			1	16
Pomona		1	3								4
Poona		3									3
Putten			4			1					5
Reading		4	1					2		14	21

TABLE 7

Non-clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Non-clinical Nonhuman Source										
Serotype	**All Others**	**Bovine**	**Chicken**	**Equine**	**Feed/Feed Supplements**	**Other birds / Wild animals**	**Other Domestic Animals /Environment**	**Porcine**	**Reptile**	**Turkey**	**Total**
Redlands							1				1
Rissen			1					1			2
Rubislaw	1		8	1			48			1	59
Saintpaul	1	1	2	1		2				86	93
Sandiego		2									2
Schwarzengrund	2	2	45			1	2	1		69	122
Senftenberg	4	24	211			4	9	3	1	299	555
Soerenga			2			4					6
Taksony			5								5
Tennessee		8	18			2	3	1		3	35
Thompson	2	1	41	1		4	2	5		3	59
Typhimurium	67	18	124	2		25	37	15	2	20	310
Typhimurium var. 5-	150	6	45			10	6	112		56	385
Uganda		23	10				2			2	37
Uganda var. 15+			3								3
Urbana	1		1								2
Virginia							1				1
Worthington	1		12			2	1			89	105
I 3,10:e,h:-										1	1
I 3,10:l,z13:-							1				1
I 3,15,34:z10:-			1								1
I 4,12:l,v:-										1	1
I 4,[5],12:-:1,2							1				1
I 4,[5],12:Nonmotile			7								7
I 4,[5],12:i:-	3	3	81	1		15	38				141
I 4,[5],12:r:-			1								1
I 6,7:-:1,5			5				2	1			8
I 6,7:-:e,n,z15			1								1
I 6,7:b:-							1				1
I 6,7:d:-			1								1
I 6,7:e,h:-				1							1
I 6,7:k:-			3								3
I 6,7:r:-							1				1
I 6,7:z10:-			2								2
I 6,8:-:1,2		1									1
I 6,8:d:-			1				1				2
I 8,20:-:z6			13								13
I 8,20:i:-			2								2
II 58:d:z6	1										1
IIIa 18:z4,z32:-										19	19
IIIa 43:z4,z23:-			1								1
IIIa 48:g,z51:-			1								1
IIIa 53:z4,z23:-										6	6

TABLE 7

Non-clinical Salmonella isolates from nonhuman sources
Reported to CDC and NSVL by serotype and source, 2006

	Non-clinical Nonhuman Source										
Serotype	**All Others**	**Bovine**	**Chicken**	**Equine**	**Feed/Feed Supplements**	**Other birds / Wild animals**	**Other Domestic Animals /Environment**	**Porcine**	**Reptile**	**Turkey**	**Total**
IIIb 38:(k):z35	1								1		2
IIIb 47:k:z35	1										1
IIIb 50:k:z53	1										1
IIIb 50:z52:z35									2		2
IIIb 53:k:e,n,x,z15									1		1
IIIb 61:-:1,5,7							1				1
IIIb 61:c:z35							1				1
IIIb 61:z52:1,5,7							1				1
IV 45:g,z51:-	3										3
Rough, mucoid, and/or nonmotile isolates		2	16			1		2		4	25
Total	**312**	**881**	**2869**	**21**	**2**	**160**	**465**	**321**	**16**	**1659**	**6706**

FIGURE 2

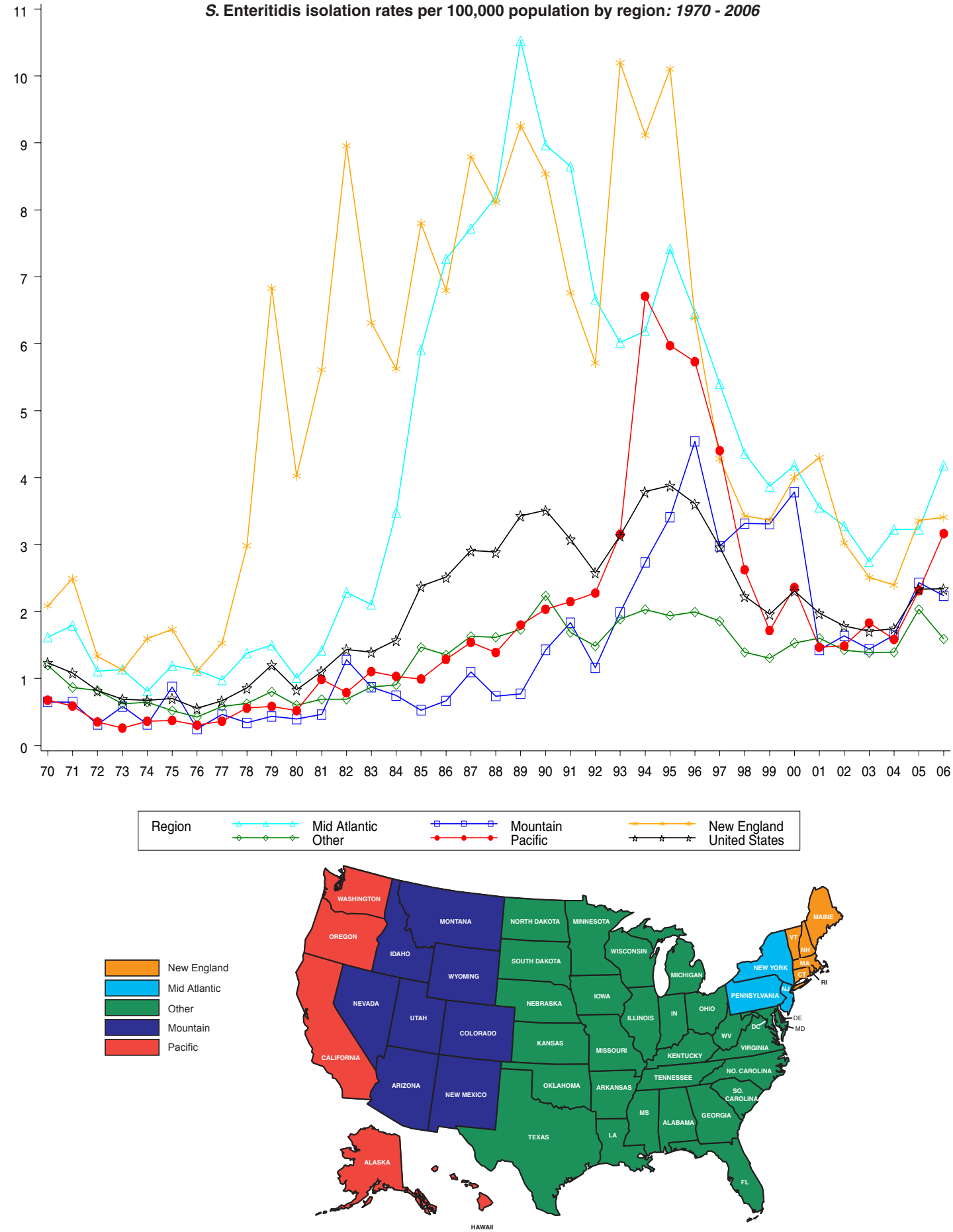
S. Enteritidis isolation rates per 100,000 population by region: *1970 - 2006*
11
10
9
8
7
6
5
4
3
2
1
0
70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06
Region
Mid Atlantic
Other
Mountain
Pacific
New England
United States
New England
Mid Atlantic
Other
Mountain
Pacific
WASHINGTON
OREGON
CALIFORNIA
IDAHO
NEVADA
MONTANA
WYOMING
UTAH
ARIZONA
COLORADO
NEW MEXICO
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
MINNESOTA
IOWA
MISSOURI
ARKANSAS
LA
WISCONSIN
ILLINOIS
MICHIGAN
IN
OHIO
KENTUCKY
TENNESSEE
MS
ALABAMA
GEORGIA
FL
SO. CAROLINA
NO. CAROLINA
VIRGINIA
WV
PENNSYLVANIA
NEW YORK
MAINE
VT
NH
MA
CT
RI
NJ
DE
MD
DC
ALASKA
HAWAII

FIGURE 3

Top 4 *Salmonella* Serotype *Isolates rates in the United States per 100,000 population: 1970 - 2006*