

## Salmonella Serotypes in Nebraska for 2006

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Two hundred nineteen *Salmonella* isolates were submitted for serotyping to the NPHL from laboratories throughout Nebraska in 2006 (the number includes only one isolate per patient). The top 5 *Salmonella* serotypes detected in the state during this time were serotype Typhimurium (Group B, 15.5%), Enteritidis (Group D, 13.2%), Typhimurium 5 null (Group B, 12.3%), Newport (Group C2, 7.3%), and Heidelberg (Group B, 4.6%) (see **Table 1**).

**Table 1.** Most frequently detected *Salmonella* serotypes identified from Nebraska in 2006.

Rank	Serotype	Serogroup	Number	(%) <sup>a</sup>	National Rank	(%) <sup>b</sup>
1.	Typhimurium	B	34	(15.5)	1.	(16.4)
2.	Enteritidis	D	29	(13.2)	2.	(14.1)
3.	Typhimurium 5 null <sup>c</sup>	B	27	(12.3)	6.	(2.8)
4.	Newport	C2	16	(7.3)	3.	(9.3)
5.	Heidelberg	B	10	(4.6)	5.	(4.9)
6.	Montevideo	C1	9	(4.1)	7.	(2.4)
6.	Muenchen	C2	9	(4.1)	9.	(2.1)
8.	Oranienburg	C1	5	(2.3)	14.	(1.4)
8.	Saintpaul	B	5	(2.3)	10.	(1.9)
8.	Thompson	C1	5	(2.3)	15.	(1.4)

<sup>a</sup>Based on a total of 219 isolates that were serotyped.  
<sup>b</sup>Reported through the CDC Public Health Laboratory Information System (PHLIS) and recorded by the National *Salmonella* Surveillance System, 2004.  
<sup>c</sup>Formerly called serotype Typhimurium var Copenhagen.

The two most common serotypes detected in Nebraska were similar in percentage to the two most common detected in the U.S.; however, the ranking for the following 8 isolates showed a substantial difference when comparing between the Nebraska and the national data (1). Especially notable were the #4 ranking for serotype Javiana nationally (5.0%) with the rare detection of this isolate in Nebraska (0.4%) and the #3 ranking of serotype Typhimurium 5 null in Nebraska compared with the #6 ranking nationally. Serotype Typhimurium 5 null has been shown to have increased resistance to antimicrobial agents when compared to other *Salmonella* serotypes. Resistance to ampicillin, chloramphenicol, streptomycin, sulfamethoxazole, and tetracycline are especially troublesome with strains of this serotype. One strain, referred to as the Definitive Phage Type 104 (DT104) was originally detected in the US causing an outbreak in Nebraska during 1996 and continues to be recognized from isolates submitted to the NPHL (2).

To date, 43 different *Salmonella* serotypes have been identified as isolates detected in Nebraska during 2006. Of these, 9 serotypes were identified that had been rarely observed nationally between the years 1994 and 2004 (the most recent data available from the CDC). (**Table 2**). One serotype called S.I 9:Lz28 following testing at the CDC, had not previously been detected in the U.S.

Overall, 206 of the *Salmonella* serotype isolates were detected from stool with 10 detected from blood, 2 from sputum, and one from a right knee specimen (**Table 3**). The blood isolates represented 7 different serotypes with serotype Typhi detected in one sample.

The recent (February 2007) multi-state outbreak of *Salmonella* serotype Tennessee associated with peanut butter contamination, was also represented in the results of testing at the NPHL during the Fall of 2006 [[http://www.cdc.gov/incidod/dbmd/diseaseinfo/salmonellosis\\_2007?outbreak\\_notice.htm](http://www.cdc.gov/incidod/dbmd/diseaseinfo/salmonellosis_2007?outbreak_notice.htm)]. Four isolates submitted to the NPHL (2 from Nebraska, 1 from Kansas, and 1 from Iowa) were identified as serotype Tennessee (Group C1) before an outbreak from peanut butter was recognized. Once a national outbreak was identified following an epidemiological investigation, the isolates were fingerprinted using pulse field gel electrophoresis (PFGE) to determine if they were associated with the outbreak. The isolates

**Table 2.** *Salmonella* serotypes detected from isolates submitted to the NPHL that have been rarely detected following national surveillance activities. <sup>a</sup>

Serotype <sup>b</sup>	National yearly average <sup>c</sup>
Aberdeen	5
Arechawaleta	6
Idikan	2
Kingabwa	3
Wadsworth	6
S.I 9:Lz28:-	ND <sup>d</sup>
S.IIIa 47:z4 z23:-	<1
S.IIIa 48:z4 z24:-	1
S.IIIb 50:k:z	1

<sup>a</sup>Reported through the Public Health Laboratory Information System (PHLIS) and presented in the National *Salmonella* Surveillance Summary, 2004.

<sup>b</sup>All were reported in one case each and all were confirmed by the CDC.

<sup>c</sup>A yearly average of cases reported nationally for the period 1994 through 2004.

<sup>d</sup>Not previously detected nationally.

**Table 3.** Specimen source of *Salmonella* isolates submitted to the NPHL for serotyping in 2006.

Source	Number <sup>a</sup>
Stool	206
Blood	10 <sup>b</sup>
Sputum	2 <sup>c</sup>
Knee	1 <sup>d</sup>

<sup>a</sup>Includes only one isolate per patient for a total of 219 isolates.

<sup>b</sup>Includes the following *Salmonella* serotypes (number): Anatum (1), Bareilly (1), Dublin (1), Heidelberg (2), Typhi (1), Typhimurium (1), and Typhimurium 5 null (3)

<sup>c</sup>Includes one isolate each of serotype Idikan and Schwarzengrund.

<sup>d</sup>Isolate identified as serotype Gaminara.

tested at the NPHL had an identical PFGE fingerprint to those associated with the outbreak thus indicating they were a part of the clonal spread of this strain. No additional cases have been identified in Nebraska as of April 1, 2007. The NPHL continues to serotype isolates sent to the laboratory to recognize those that may be associated with the present outbreak and any other potential outbreaks that may occur.

For additional information concerning the *Salmonella* Serotyping Program at the NPHL, contact Beth Schweitzer at 402-559-6098 or Dr. Iwen at 402-559-7774. Information concerning susceptibility testing of the *Salmonella* will be presented in a future newsletter.

## References

1. CDC. *Salmonella* Surveillance Annual Summary, 2004. Atlanta, Georgia; U.S. Department of Health and Human Services, CDC, 2005.
2. CDC. Multidrug-resistant *Salmonella* serotype Typhimurium, United States, 1996. MMWR, Morbidity and Mortality Weekly Report. 1997, 46: 308-10.