



Centers for Disease Control and Prevention
Atlanta, GA 30333

January 13, 2003

To: State and Territorial Epidemiologists State and Territorial Public Health Laboratory Directors

Through: Director, Division of Bacterial and Mycotic Diseases

Subject: Update on *Salmonella* Serotype Enteritidis Infections, Outbreaks, and the Importance for Traceback and Timely Reporting of Outbreaks

We are asking your assistance in the continued surveillance of *Salmonella* serotype Enteritidis (SE) infections in the United States. In 2000, SE was the second most common *Salmonella* serotype reported to CDC through the Public Health Laboratory Information System (PHLIS), accounting for over 6,000 isolates. Although surveillance data indicate that SE incidence has decreased in recent years, outbreaks continue to occur, and eggs continue to be a frequently implicated vehicle.

In 1999, The President's Council on Food Safety developed an Egg Safety Action Plan calling for a 50% reduction in the number of egg-associated SE illnesses by 2005, with the ultimate goal of eliminating SE illnesses associated with eggs. Timely notification of outbreaks will help attain this goal by allowing the U.S. Food and Drug Administration or your state Department of Agriculture to conduct rapid tracebacks to identify sources of contamination and prevent future outbreaks.

This document contains 1) a summary of outbreaks of SE infections reported to CDC with first onset of infection in 2001 (Appendix A and Table), 2) an outline of procedures for reporting SE outbreaks to CDC and obtaining isolates for laboratory subtyping of SE (Appendix B), and 3) CDC guidelines for investigating possible egg-associated SE outbreaks (Appendix C). Please share this information with your personnel who conduct SE outbreak investigations. If the information in the table on outbreaks in your state is incomplete or inaccurate, please contact Nicole Tucker at CDC's Foodborne and Diarrheal Diseases Branch, telephone (404) 639-2206; fax (404) 639-2205; email nct4@cdc.gov.

We recognize that surveillance of SE infections and outbreaks represents a considerable effort on the part of state and local health departments. We hope that you find the attached information useful, and we look forward to working with you toward controlling this important public health problem.

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APPENDIX A

Summary of *Salmonella* serotype Enteritidis Outbreaks Reported in 2001

State and local health departments reported 46 confirmed outbreaks of *Salmonella* serotype Enteritidis (SE) infection to CDC for calendar year 2001. These outbreaks resulted in 1681 reported illnesses, 102 hospitalizations and no deaths among residents of 23 states (Table). Compared with 2000 data, there were 4 fewer outbreaks, 49 fewer hospitalizations, and 720 more illnesses in 2001. The median number of cases per outbreak was 10 in 2001, compared with 6 in 2000.

A suspected food vehicle was identified for 29 (63%) of 46 outbreaks; 24 of these were confirmed by culture or statistical association. Eggs were an ingredient in 15 (63%) of 24 confirmed vehicles, including meringue pie, home-made ice cream, and butter. In addition, eggs were an ingredient in one (20%) outbreak in which the suspected food item was not confirmed. Between 1993 and 1999, an average of 80% of vehicle-confirmed outbreaks have been egg-associated.

Twenty-eight (61%) of the 46 outbreaks occurred in commercial food establishments (e.g., restaurants, delicatessens, bakeries, caterers), one (2%) outbreak occurred in a long-term care facility, two (4%) occurred in correctional facilities, and 14 (30%) took place in the general community (e.g., private homes, day care facilities, community centers, religious meeting places). For comparison, 60% of outbreaks between 1993 and 1999 occurred commercial food establishments, 4% occurred in nursing homes or long-term care facilities, and 8% in the general community.

An egg traceback investigation was conducted for 10 (63%) of 17 outbreaks in which the confirmed vehicle was eggs. Two traceback investigations narrowed to a distributor as the likely source of implicated eggs, five narrowed to multiple farms, and two narrowed to a single farm. Information for one traceback was not available. Environmental testing for SE was conducted in three investigations. SE was isolated from the environment of one farm; eggs from this farm were diverted to pasteurization.

Phage typing was performed on patient isolates in 24 (52%) of outbreaks. SE phage type 8, which accounted for 28% of the reported outbreaks between 1993 and 1999, accounted for 38% of the 24 SE outbreaks in 2001. Five SE phage type 8 outbreaks occurred in eastern states; none occurred in Michigan or Ohio. An egg-containing food vehicle was suspected or confirmed in 3 (33%) SE phage type 8 outbreaks. Among the remaining outbreaks for which isolates were phage typed, 5 (22%) were caused by phage type 13a and 2 (8%) by phage type 13. Phage type 913, historically rare in the United States, caused one outbreak linked to mung bean sprouts made from imported bean seeds.

While the number of SE outbreaks reported for the New England and Mid-Atlantic states increased slightly from 10 in 2000 to 12 in 2001, the number is considerably lower than the 42 outbreaks reported from that part of the country in 1992. The number of SE

outbreaks reported in the Mountain and Pacific states decreased from 22 in 1999 to six in 2001. Although the precise reason for the decrease in both regions is unclear, it may be a combination of increased participation in egg quality assurance programs on farms, improvements in egg preparation practices, and food handler education.

APPENDIX B

Procedures for reporting SE outbreaks and obtaining isolates for laboratory subtyping

Procedures for reporting outbreaks of SE infections to CDC

CDC's Foodborne and Diarrheal Diseases Branch requests notification of SE outbreaks and outbreaks of group D *Salmonella* infections as soon as health departments become aware of them, regardless of whether or not a vehicle has been implicated, and regardless of whether or not eggs are the suspected vehicle.

Please contact the Foodborne and Diarrheal Diseases Branch at (404) 639-2206 to report any SE outbreaks, and send final reports of outbreak investigations to:

SE Outbreak Surveillance
Foodborne and Diarrheal Diseases Branch Centers for Disease
Control and Prevention
1600 Clifton Road, Mailstop A-38 Atlanta, Georgia 30333
Tel: (404) 639-2206
Fax: (404) 639-2205
E-mail: nct4@cdc.gov

Procedures for laboratory subtyping of SE isolates

Phage typing is a valuable tool for monitoring trends in SE infections, and therefore, we would like to determine the phage type of each reported outbreak. The CDC Foodborne and Diarrheal Diseases Laboratory Section can provide subtyping support for outbreak investigations by determining the phage type of SE isolates. Although isolates can also be subtyped using pulsed-field gel electrophoresis, this method is in some instances less discriminatory than phage typing. If you have isolates from any SE outbreak in 2000 or other years that have not yet been sent to CDC, we would still like to receive them.

Please send one human isolate and any outbreak-associated food isolates, accompanied by a DASH form for each isolate, to:

Peggy S. Hayes
Centers for Disease Control and Prevention
Foodborne and Diarrheal Diseases Laboratory Section
1600 Clifton Road, Mailstop C-03
Atlanta, GA 30333
Telephone: (404) 639-3815

For each isolate submitted, **please indicate the outbreak with which it was associated** and whether it came from a patient, foodhandler, or food source. Please specify that the isolate is being submitted for phage type determination.

APPENDIX C

CDC Guidelines for Investigating Possible Egg-Associated SE Outbreaks

Role of the FDA in SE outbreak investigations

Since October 1, 1995, FDA has administered an SE outbreak traceback program under authority of the Food, Drug, and Cosmetic Act. FDA assumed federal responsibility for SE tracebacks after the United States Department of Agriculture (USDA) activities, including tracebacks and on-farm testing, were suspended and funding for the USDA SE program was discontinued in October 1995.

When evidence indicates that contaminated eggs were the probable source of SE in a human outbreak, FDA will conduct microbiologic assessment of all production flocks that provided eggs at the time of the outbreak and will monitor diversion of shell eggs from SE-infected farms to pasteurization facilities. Early reporting of egg-associated SE outbreaks to the Foodborne and Diarrheal Diseases Branch is encouraged to facilitate coordination with FDA and increase the proportion of egg-associated outbreaks that result in egg traceback and flock testing. To facilitate state and FDA tracebacks and poultry flock activities, CDC requests preliminary notification of SE outbreaks in which eggs are considered the implicated source, based on reliable epidemiologic information and/or statistically significant correlation between foods eaten and incidence of illness and/or SE isolation from remaining food samples.

To initiate a traceback, FDA requires a letter from the state that indicates any epidemiologic and environmental evidence of egg association in the outbreak.

Shell Egg Tracing

In an SE outbreak in which shell eggs are implicated, the following information should be collected to enable traceback of the eggs:

1. Whether cartons or cases in which the eggs used in the implicated food vehicle were still available at the time of the investigation. Whether any eggs were left in the container that held the suspected eggs.
2. Type and packing method of suspected eggs. (Note the source of each item mentioned, e.g., cartons or invoices)
 - a. Size (extra-large, large, medium, small, jumbo)
 - b. Color (white or brown)
 - c. Pack type
 - Bulk container (loose)--15- or 30-dozen case
 - Consumer container--1 dozen, 18 egg, or 2½ dozen, styrofoam
 - d. All identifying markings, if the container is available (this information may be available on the packing slip): Dates of pack, packer identification (plant number

and state or federal [based on color of ink] packer), name and address of packer, grading line number or letter, sell-by date, expiration date, federal or state grade shield, and flock code.

e. Grade (AA, A, B, Not Graded)

3. Date(s) that eggs used or probably used in the implicated food vehicle were received at the outbreak location.
4. Source of eggs (including copies of all invoices, purchase receipts, and shipping and receiving documents); e.g., outbreak eggs were received directly from (name and address of distributor or processing plant that delivers eggs to the outbreak location).

If the egg shipment(s) went through one or more "stops" (middlemen or points of transfer such as a food wholesaler or distributor) between the egg production farm of origin and outbreak site and/or consists of eggs from more than one egg production farm of origin, provide the identification of each.

A copy of the final investigation reports for egg-implicated and other SE outbreaks should be sent to CDC to maintain accurate data in the SE Surveillance System. If an egg traceback investigation was performed, please indicate whether SE was isolated from the farm and if so, whether representative samples have been forwarded to CDC. Please send this information to:

SE Outbreak Surveillance
Foodborne and Diarrheal Diseases Branch
1600 Clifton Road, Mailstop A-38
Centers for Disease Control and Prevention
Atlanta, GA 30333
Tel: (404) 639-2206
Fax: (404) 639-2205
E-mail: nct4@cdc.gov

Salmonella serotype Enteritidis outbreaks reported to CDC, by Date of Onset, January 1-December 31, 2001 Updated 12/18/2002

CDC ID #	Onset Month	State	City or County	Cases (#)	Hosp (#)	Deaths (#)	Exposure Location	Phage		Vehicle Confirmed? ¹	Confirmed	Egg	SE Isolated
								type ²	Suspected Vehicle		Vehicle Contained Shell Eggs?	Traceback Done?	From Farm?
1	1	CT	Fairfield	6	1	0	Restaurant	RDNC	Unknown	N	-	-	-
2	1	DC	N/A	10	3	0	Restaurant		Crab cakes	Y	N	-	-
3	1	HI	Oahu	26	0	0	Community	1	Mung bean sprouts	N	-	-	-
4	2	MD	Baltimore	9	0	0	Restaurant	8	Unknown	N	-	-	-
5	2	SC	Richland	688	0	0	Correctional facility	2	Tuna salad w/egg	Y	Y	Y: Local	Y
6	3	IL	Libertyville, Lake	3	3	0	Unknown		Unknown	N	-	-	-
7	3	OH	Portage	53	10	0	Restaurant	13a	Eggs	Y	Y	Y: Local	N/A
8	4	FL	Orange/Seminole	30	0	0	Restaurant	913	Mung bean sprouts	Y	N	-	-
9	4	MD	Prince George's	3	1	0	Private Home	8	Homemade ice cream	N	Y ³	N	N
10	4	ME	Waterville	23	5	0	Restaurant	13	Hollandaise sauce	Y	Y	Y: Local	N/A
11	4	VA	Henrico	231	34	0	Restaurant	8	Raw egg butter	Y	Y	Y: FDA	N/A
12	4	ML*	Jackson	4	0	0	Community	30	Raw almonds	Y	N	-	-
13	5	CT	New London	6	1	0	Restaurant		Prime rib	Y	N	-	-
14	5	MN	Hennepin	46	0	0	Hotel	13a	Eggs benedict	Y	Y	Y: Local	N
15	5	PA	Bucks	10	0	0	Community	8	Unknown	N	-	-	-
16	5	TX	Richland	12	0	0	Catered Event	2	Cake icing w/egg	Y	Y	N	-
17	6	CA	Los Angeles	17	0	0	Conference	8	Chicken salad	N	-	-	-
18	6	ID	Emmett	12	4	0	Private Home		Homemade ice cream	Y	Y	Y: Local	N
19	6	IL	Chicago, Cook	3	2	0	Restaurant	13	Unknown	N	-	-	-
20	6	MA	Scituate	47	6	0	Country Club	RDNC	Steak, salad dressing, ice	Y	N	-	-
21	6	MD	Anne Arundel	3	0	0	Restaurant	8	Meringue pie	Y	Y	N	-
22	6	MD	Baltimore City	26	0	0	Private Home		Multiple	Y	Y	N	-
23	6	ME	Hancock	6	2	0	Restaurant		Unknown	N	-	-	-
24	6	MN	Fairbault	18	4	0	Restaurant	13a	Eggs	Y	Y	Y: Local	N/A
25	6	NC	Multiple	113	0	0	Community	13a	Eggs	Y	Y	Y:FDA	N/A
26	6	PA	Lycoming	2	3	0	Church		Coconut cream pie	Y	Y	Y: Local	N/A
27	6	PA	N/A	2	1	0	Cruise Ship		Unknown	N	-	-	-
28	6	VA	Lynchburg	28	0	0	Restaurant	RDNC	Unknown	N	-	-	-
29	7	AZ	Scottsdale	3	0	0	Cruise Ship	13A	Unknown	N	-	-	-
30	7	IL	Chicago, Cook	29	4	0	LTC facility	8	Unknown	N	-	-	-
31	7	MA	Harwich	6	0	0	Convention Center	8	Bernaise sauce	Y	N	-	-
32	7	MD	Baltimore County	2	1	0	Restaurant	8	Pasta w/salmon	N	-	-	-
33	7	MI	Isabella	34	2	0	Restaurant/Casino		Egg salad, tuna salad, chicken salad	Y	Y	N	-
34	7	MI	Mid-MIDHO	5	0	0	Restaurant		Eggs	Y	Y	N	-
35	7	OH	Summitt	10	6	0	Restaurant		Crab cake, lobster cake, crab-stuffed lobster	Y	Y	Y: Local	N/A
36	7	PA	Franklin	5	0	0	Camp		Unknown	N	-	-	-

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37	7	VA	Scott	64	5	0	Camp	Unknown		N	-	-	-
38	8	IL	Schaumburg, Cook	2	2	0	Restaurant	Unknown		N	-	-	-
39	9	IA	Ames	4	0	0	College	Chicken strips		N	-	-	-
40	9	NY	Suffolk	26	0	0	Bakery	Pastries		Y	Y	N	-
41	10	NY	Nassau	18	0	0	Bakery	Cakes with icing		Y	N	-	-
42	11	FL	Orange	4	0	0	Restaurant	Turkey sandwich		Y	N	-	-
43	11	MD	Wicomico	7	1	0	Private Home	Unknown		N	-	-	-
44	11	WA	King	5	0	0	Resort	Unknown		N	-	-	-
45	11	WA	Multiple	12	0	0	Community	Unknown		N	-	-	-
46	12	MI	Branch	8	1	0	Correctional facility	Unknown		N	-	-	-
Total	46			1681	102	0							

* Multistate outbreak involving WV (2 cases), onset in April and MI (2 cases), onset in June related to large Canadian outbreak from almonds grown in California

¹ Based on reliable epidemiological information, statistical implication, or SE isolation from remaining food samples

² RDNC = Reacted but did not conform (various phage lysis patterns)

³ Although vehicle, not confirmed, suspect vehicle contained raw eggs