EPIDEMIOLOGY SECTION

CONNECTICUT EPIDEMIOLOGIST

August 1990

State of Connecticut Department of Health Services
Frederick G. Adams, D.D.S., M.P.H., Commissioner

VOLUME 10 NO. 4

SALMONELLA OUTBREAK

On June 4, the Epidemiology Program of the Department of Health Services was notified of an outbreak of gastrointestinal illness with fever and dehydration in persons who attended a wedding reception in Bristol, Connecticut on June 1. One hundred and seventy-eight persons from 14 states attended the reception.

Initial interviews with 170 guests were completed by June 11. In total, 166 (92%) developed diarrhea (3 or more loose stools in a 24 hour period), with a median onset 21 hours after the reception. Diarrhea was usually accompanied by headache (87%), fever (83%), nausea (79%), and vomiting (52%). Salmonella enteritidis (SE), phage type 8, was isolated from 70 of 76 ill persons who submitted stool specimens for culture.

Follow-up telephone interviews were conducted with 95 wedding guests who sought medical advice for their illness. Oral antibiotic therapy was prescribed for approximately 35 persons. Fifty-eight persons received intravenous fluids in a clinic or emergency room; 16 persons were admitted to a hospital.

There were no fatalities. Consumption of the main course, chicken breast with crabmeat, asparagus, and hollandaise sauce, was strongly associated with illness. The source of SE was most likely shell eggs, of which 150 were pooled together raw to make the hollandaise sauce. A report has been made to the USDA Salmonella Task Force for further investigation of the source of the implicated eggs.

SE INFECTIONS - CONNECTICUT

Since the late 1970's, Salmonella enteritidis (SE) has steadily risen in prominence as a cause of salmonellosis in Connecticut. In the late 1970's, SE was relatively infrequently isolated, accounting for less than 11% of all Salmonella isolates. Since 1987, SE has been the most common cause of salmonellosis in Connecticut. In 1989, SE accounted for 32% (335/1055) of all isolates (Figure 1). In the first seven months of 1990, SE infections have accounted for 37% (179/483) of all reported cases. In 1990, three SE outbreaks have occurred, including the outbreak at the wedding reception in Bristol.

The increase in SE has been both relative and absolute. In 1989, SE was responsible for causing illness in 10 of every 100,000 state residents, compared to an average annual rate of 6.7 per 100,000 population for the preceding 10 years.

Attack rates have been highest in persons aged <10 years, 20-29 years, and more than 80 years for both SE and other Salmonella serotypes (Table 1).

Figure 1

SALMONELLA ISOLATES CONNECTICUT 1979 - 1989

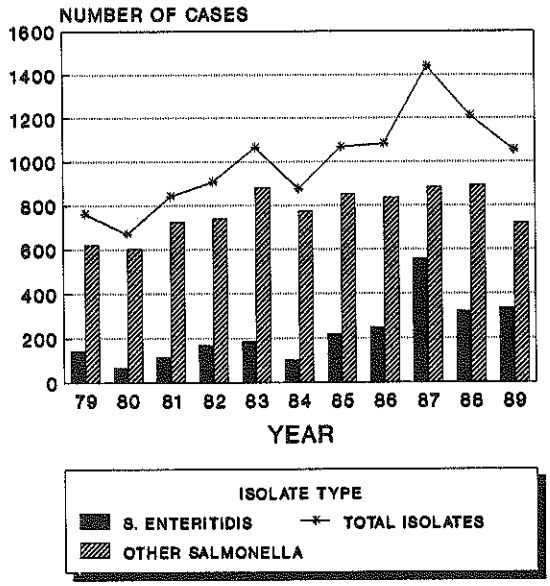

TABLE 1

SALMONELLOSIS BY TEN YEAR AGE GROUP CONNECTICUT 1985 - 89

	S. Enteritidis		Other Serotypes	
Age group	#	(Rate)*	#	(Rate)
00 - 09	285	(75.6)	1380	(366.2)
10 - 19	188	(40.5)	422	(90.0)
20 - 29	368	(65.6)	782	(139.3)
30 - 39	244	(49.6)	459	(93.4)
40 - 49	137	(37.3)	259	(70.5)
50 - 59	95	(28.7)	170	(51.4)
60 - 69	72	(23.0)	154	(49.2)
70 - 79	67	(36.0)	135	(72.6)
80 +	118	(133.7)	118	(133.7)
Unknown	107		298	
TOTAL	1681	(52.9)	4177	(131.4)

*Rate per 100,000 based on 1985 estimated population for the specific age group.

CDC UPDATE
SE INFECTIONS IN THE U.S.

Salmonella enteritidis (SE) infections, which emerged in epidemic numbers in northeastern states more than 5 years ago, have now spread to many States outside the northeast. This is a summary of recent national surveillance data about SE outbreaks collected by the Enteric Diseases Branch, Division of Bacterial Diseases (DBD), Center for Infectious Diseases, Centers for Disease Control (CDC), through intensive investigation of all reported outbreaks. This summary was adapted from an update on outbreaks of Salmonella enteritidis infections and preventive measures sent to state epidemiologists by CDC on June 13, 1990.

From 1985 through 1989, 217 outbreaks affecting 22 states and territories were reported to CDC. The annual number of outbreaks increased from 19 in 1985 to 77 in 1989. The mean size of reported outbreaks over this time did not change, suggesting that this increase is real rather than an artifact of more complete reporting of smaller outbreaks. The dominant identified source of the organism continues to be grade A shell eggs.

The number of outbreaks of SE infections occurring in the northeast, and elsewhere, have increased. As the epidemic has expanded beyond the northeast, infected flocks in a number of states outside of the northeast have been identified. The egg market is frequently interstate and largely regional; however, eggs are sometimes shipped from coast to coast.

Because infected flocks have been identified outside the northeast, it is likely that both sporadic SE cases and outbreaks of SE infections related to contaminated eggs and the foods made from them will continue to increase in many parts of the United States (U.S.).

The phagetypes of SE isolates from 63 outbreaks between 1986 and 1989 have been deter-

mined by the Enteric Diseases Laboratory Section, CDC. Several phagetypes have been identified that may be of use in distinguishing egg from non-egg outbreaks and for tracing implicated eggs back to specific farm sources. Mixed phagetype outbreaks appear to be uncommon.

Phagetype 8 has become the predominant type, and accounts for much of the increase in isolation rate outside of the northeast, while phagetype 13a and 14b have remained largely restricted to the northeast. Phagetype 2 has been reported from South America; a single phagetype 2 outbreak occurred at a hotel in Puerto Rico. Phagetype 4, the strain epidemic in western Europe, has appeared only once; this was a result of a visit by a German NATO vessel with an outbreak during a trans-Atlantic crossing. Phagetype 34 has recently emerged as a dominant phagetype in Japan, but the connection between Japan and the one phagetype 34 outbreak in the U.S. remains unclear.

Preventive Measures

The CDC recommendations to prevent SE outbreaks and to limit sporadic SE infections have been directed to affected states. As the epidemic expands to include more of the U.S., some States which were previously unaffected will need to review their current status. Whether or not a state is "affected" is determined by the State Epidemiologist.

Suggested operational definitions for an affected state include: 1) SE represents $\geq$15% of all reported Salmonella isolates (as the national proportion in 1988 was 16%); or 2) 3 or more outbreaks have occurred in the preceding two years. Some States in which the isolation rate of SE is rapidly increasing may also be considered affected, even if the total remains less than 15% of all Salmonella isolates. For affected states, the CDC recommends the following precautions to reduce the public health burden of SE outbreaks and sporadic cases:

1. Informing consumers that eggs, like other raw foods of animal origin, may cause Salmonella infections. Raw eggs are not to be considered a "health food." Keeping eggs refrigerated keeps any Salmonella present from multiplying, and thorough cooking kills Salmonella. "Thorough cooking" means that the yolk is no longer runny.

Raw or undercooked eggs are to be avoided in the diets of immunocompromised or other debilitated persons. In affected parts of the U.S., an estimated 1 in 10,000 eggs is contaminated with SE. The average consumer eats 200 shell eggs per year, so that the minimum risk of encountering a contaminated egg is 2% per year, assuming that eggs are not pooled.

2. Advising restaurants, schools, and other food service establishments of the risk posed by raw and undercooked eggs. Many egg recipes such as scrambled eggs, French Toast, Monte Cristo sandwiches, and omelets are typically made using pooled eggs. Pooling 500 eggs increases the chance of exposure to a contaminated egg from 1 in 10,000 to 1 to 20. Such recipes are safer if pasteurized egg products are used instead of bulk pooled raw eggs.

Other recipes routinely lead to consumption of raw or lightly cooked eggs, including Caesar salad, home-made egg nog, hollandaise sauce, bernaise sauce and homemade mayonnaise. These high risk foods would also be safer if pasteurized egg products were substituted for raw egg.

Bulk pasteurized egg white, egg yolk, and mixed egg products are available in commercial quantities. Most pasteurized egg product is frozen and must be used within a few days of being thawed. Ultrapasteurized product with a prolonged refrigerator holding time is also available. No outbreak in the last 5 years has been traced to pasteurized egg product.

3. Reviewing menus, recipes and food handling practices in nursing homes, hospitals, and food services for the homebound elderly to prevent exposure to raw and undercooked eggs. The nursing home population appears to be at particularly high risk for severe outcome and death from SE infections.

Substitution of pasteurized egg products for fresh in nursing homes and hospitals is the single most important step to prevent such outbreaks. Several outbreaks have been traced to blenders used for both raw eggs and pureed foods. Requiring use of separate blenders to scramble eggs and to puree cooked foods would reduce the risk of cross-contamination. Routine disassembly and sanitization of blenders after blending raw egg is another critical step that warrants special attention. Responsibilities for inspection and certification of food service facilities in hospitals and nursing homes vary by States and may be diffuse. Accreditation by the Joint Commission on the Accreditation of Health Care Organizations does not guarantee regular food service inspection nor food handler training. Collaborative efforts by State agencies may be necessary to insure the continued safety of food services in hospitals and nursing homes.

For Public Health Emergencies Call
The State of Connecticut Department of Health Services at

566-4800

after normal working hours (4:30 P.M.), weekends, and holidays.

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