

Preharvest
Salmonella
enteritidis
(SE)
Prevention
by US Egg
Producers

- Eric Gingerich DVM
- Diamond V, a Cargill company
- AAAP Food Safety Symposium
- July 30, 2025

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Outline

Brief history of SE in the US

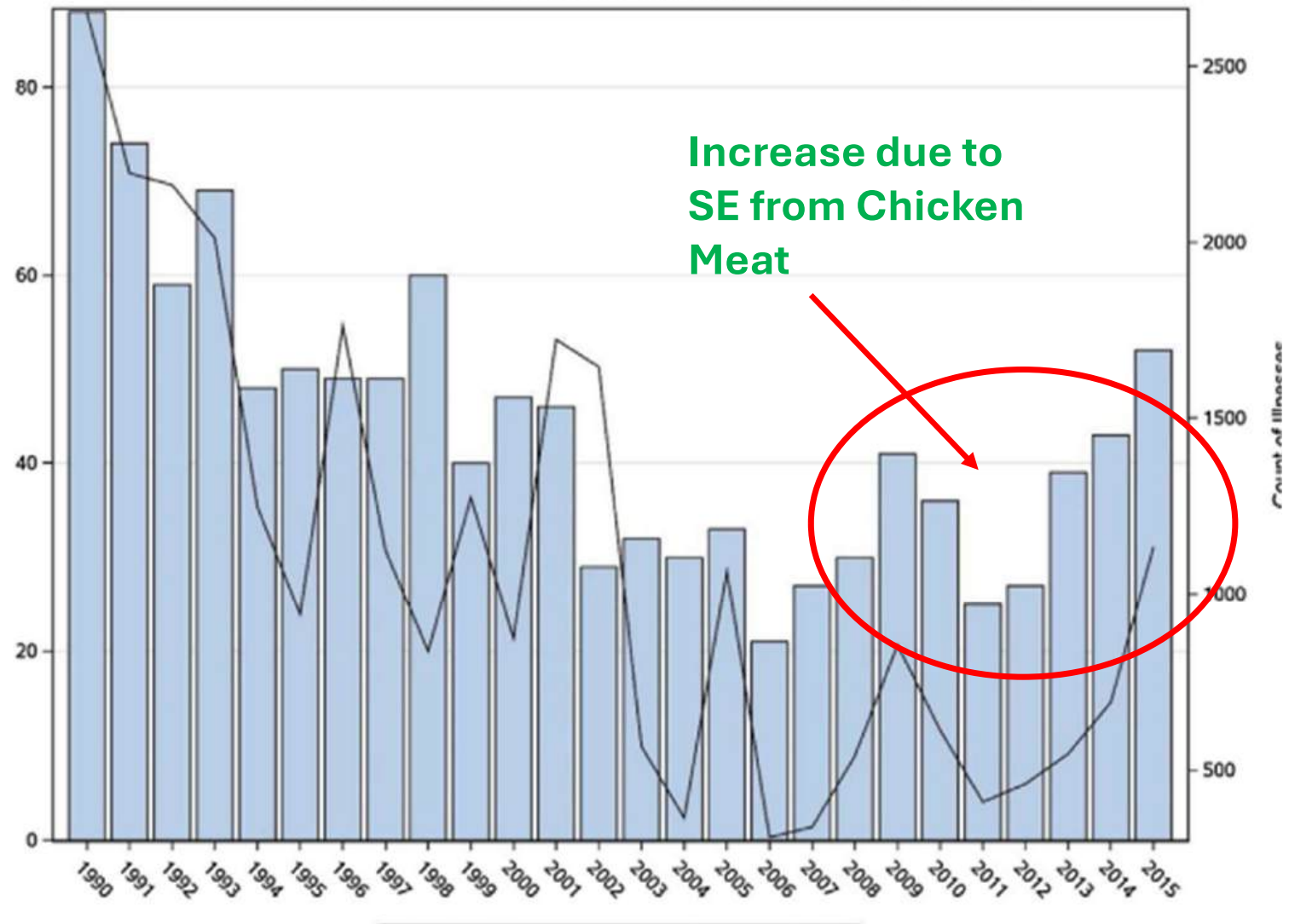
FDA Egg Safety Plan

Preharvest tools used by US egg producers

Recent outbreaks of SE in the US

Summary

Count of Salmonella Enteritidis Outbreaks & Illnesses in U.S. (1990-2015)



2021
International
Journal of
Infectious
Diseases – SE
Outbreaks in the
US

Preharvest Tools to Prevent SE

- **Goal = Eliminate introduction of SE into the processing plant**
- 1. FDA Egg Safety Plan Components
- 2. Vaccinations
- 3. Feed additives to reduce Salmonella



CDC image 16877/James Archer

Progression to FDA Egg Safety Rule

NY Nursing Home SE
Outbreak from Shell
Eggs

1989

1992

USDA/FDA SE Pilot
Project Task Force

PEQAP Established

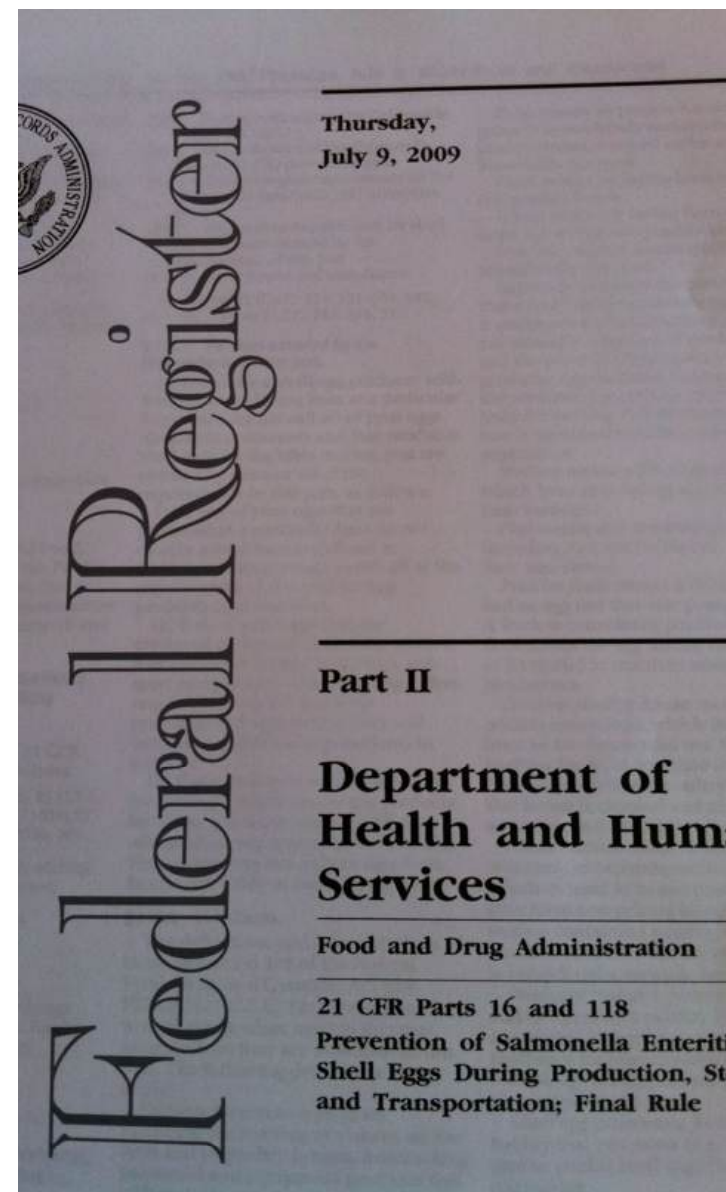
1994

FDA Egg Safety Rule
Initiated

2009

FDA Egg Safety Rule

- Initiated in the Federal Register in 2009 (21 CFR part 118)
- Components derived from the SE Task Force in the 1990's and state SE programs
 1. Negative pullets
 2. Biosecurity
 3. C&D of positive houses
 4. Pest control
 5. Refrigeration of eggs
 6. Testing of flocks
 7. Records



FDA Egg Safety Rule – Negative Pullets

- Obtain pullet chicks from NPIP US SE Clean Program participating hatchery
- Grow pullets in an environment conducive to negativity to SE
- Test prior to move to lay at 14 to 16 weeks

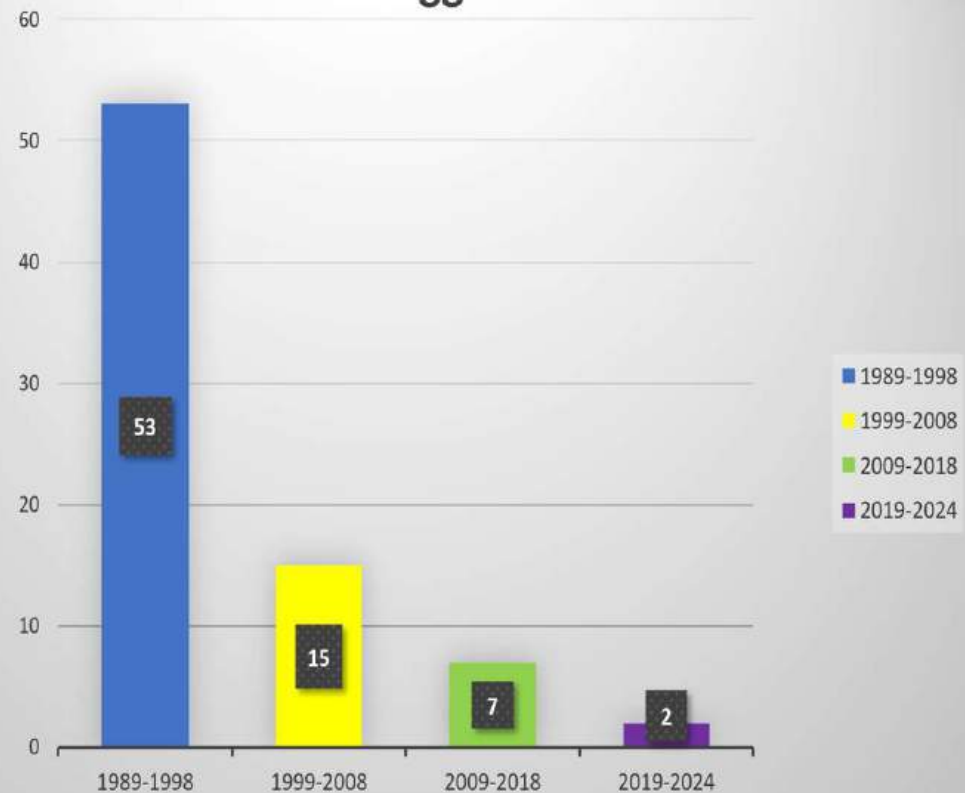




NPIP US SE Clean Program

At a minimum, layer breeder flocks are monitored using 4 litter drag swabs and 2 nest swabs in the lay house once a month starting the first month

SE Isolations- Egg Breeders



FDA Egg Safety Rule

Biosecurity: Take steps to ensure that there is no introduction or transfer of SE into or among poultry houses, to include (at a minimum):

- Limit visitors on the farm and in the poultry houses;
- Maintain practices that will protect against cross contamination when equipment is moved among poultry houses;
- Maintain practices that will protect against cross contamination when persons move between poultry houses;
- Prevent stray poultry, wild birds, cats, and other animals from entering poultry houses; and
- Do not allow employees to keep birds at home.

FDA Egg Safety Rule – C&D of Positive Houses

- Complete C&D of a house following removal of an SE positive flock is required



FDA Egg Safety Rule

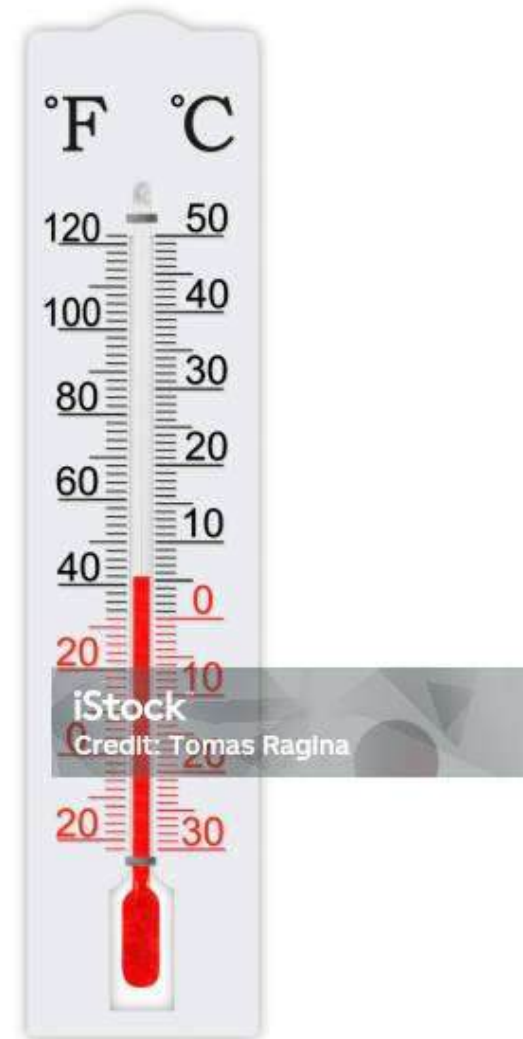
Rodents, Flies, and Other Pest Control:

- Monitor for rodents by visual inspection and mechanical traps or glueboards or another appropriate monitoring method and, when monitoring indicates unacceptable rodent activity within a house, use appropriate methods to achieve satisfactory rodent control;
- Monitor for flies by spot cards, Scudder grills, or sticky traps or another appropriate monitoring method and, when monitoring indicates unacceptable fly activity within a house, use appropriate methods to achieve satisfactory fly control; and
- Remove debris within a house and vegetation and debris outside a house that may provide harborage for pests.

FDA Egg Safety Rule

– Egg Refrigeration

- Refrigeration: Hold and transport eggs at or below 45F ambient temperature beginning 36 hours after time of lay.



FDA Egg Safety Rule – Testing Schedule

- Pullets
 - Manure swabs tested for SE
 - 14 to 16 weeks
- Layers
 - Manure swabs tested for SE
 - 40 to 45 weeks
 - 4 to 6 weeks post-molt after reaching 50% production
- The goal is to test SE negative at each test



FDA Egg Safety Rule – Egg Sampling/Testing

- If manure tests are positive, egg testing required
- Each test is a minimum of 1,000 intact eggs – eggs from flock are voluntarily withheld from market until test results are obtained to avoid having recalls
- 4 tests at two-week intervals required
- Testing method according to FDA Bacteriological Analytical Manual
- Eggs pooled 20 eggs per pool
- If any pool tests positive, eggs must be diverted to hard-cooking or pasteurization
- Approximate cost of testing - \$5000 to \$10,000



FDA Egg Safety Rule

Required Records:

- A written SE prevention plan;
- Documentation that pullets were raised under “SE-monitored” conditions;
- Records documenting compliance with the SE prevention measures, as follows:
 - ✦ Biosecurity measures.
 - ✦ Rodent and other pest control measures.
 - ✦ Cleaning and disinfection procedures performed at depopulation.
 - ✦ Refrigeration requirements.
- Environmental and egg sampling procedures;
- Results of SE testing;
- Diversion of eggs;
- Eggs at a particular farm being given a treatment; and
- Records of review and of modifications of the SE prevention plan and corrective actions taken.

Incentives for Obtaining Negative SE Drag Swab Tests for the FDA Egg Rule

Disruption of egg flow

Cost of egg testing

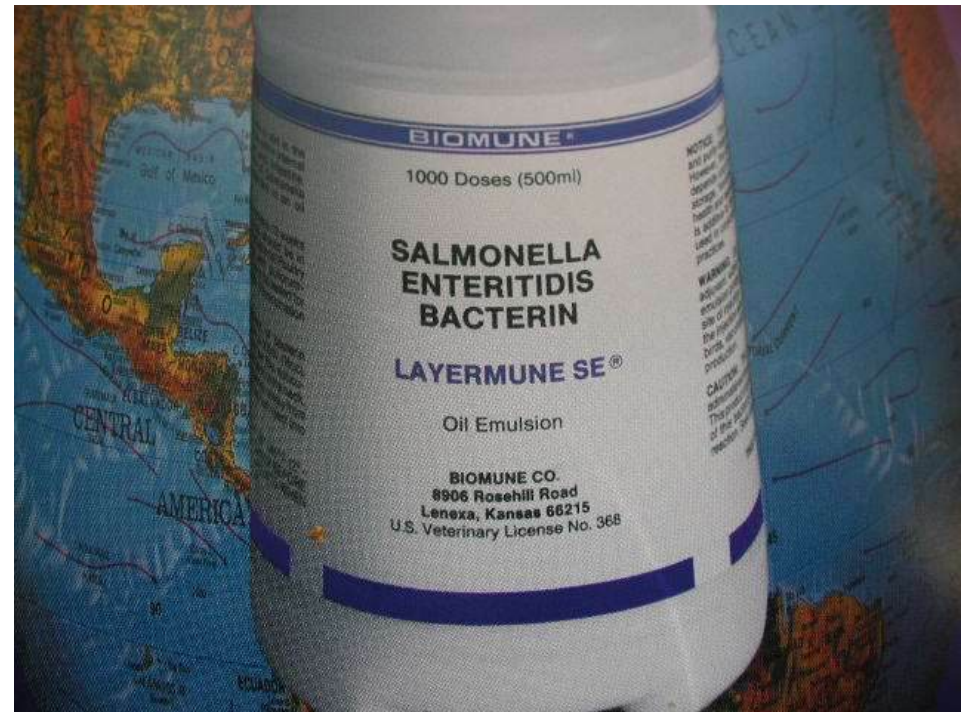
Possibility of sending eggs to
breaking or hard-cooking for less
money

Tools Being Used For SE Elimination



Vaccinations for SE Prevention

- 2 live Salmonella typhimurium (ST) vaccinations
 - Day old spray and 2 to 5 weeks spray or water
- Inactivated SE bacterin
 - 10 to 14 weeks typically
- Optional
 - An additional live ST vaccine after the killed vaccine
 - Booster live ST vaccinations during lay, 50 to 70 weeks



Feed Additives to Reduce Risk of SE

Probiotics

- Live beneficial bacteria that produce compounds that inhibit Salmonella

Prebiotics

- Increase the beneficial bacteria in the gut

Postbiotics

- Fermentation metabolites that inhibit Salmonella in various ways

Phytogenics

- Directly inhibit Salmonella growth

Feed sterilants

- Kill any Salmonella if present in feed ingredients

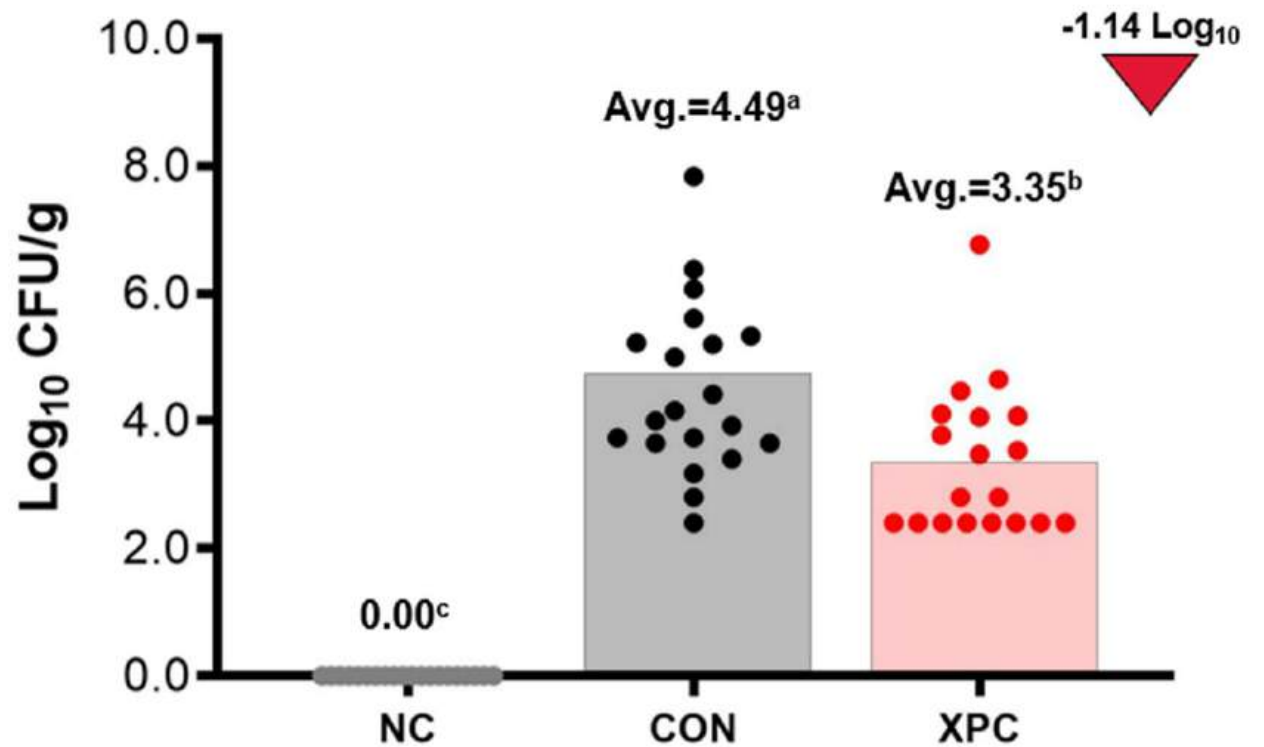
Walmart Best-in-Class Program

- Initiated in 2013 to proactively reduce Walmart egg customers' risk
 - Follow FDA Egg Safety Rule components
 - Vaccinate
 - 2 live ST and 1 SE bacterin
 - Feed one of the products on the approved list of SE preventative feed additives that have shown at least a 1 log₁₀ reduction in SE in feeding trials
 - Calsporin, IMW50, BackPak
 - XPC
 - Celmanax
 - Actigen



Example of Test Results for a Feed Additive

Ceca Samples 7 days Post-Challenge



C&D in mid-lay

- Some producers remove all litter and apply disinfectant to floors in mid-lay
- Some once (50 weeks for example)
- Some twice (50 and 70 weeks)



Recent Egg-
Associated
SE
Outbreaks
With
Recalls and
Human
Illness

Milo's Poultry Farm

August Farms

SE Outbreak – Milo's Eggs, September 2024

- Bonduel WI
- May 23 to Aug 10, 2024
- 65 people
- 9 states
- 24 hospitalized
- 0 deaths
- Amish producer with 20 contract producers plus himself
- Only 3 live ST vaccinations used during grow



SE Egg Recall – August Egg Farm, California, June 2025



Nearly 2 million eggs recalled
over *Salmonella* concerns

The FDA confirmed reports of
illnesses in seven states.

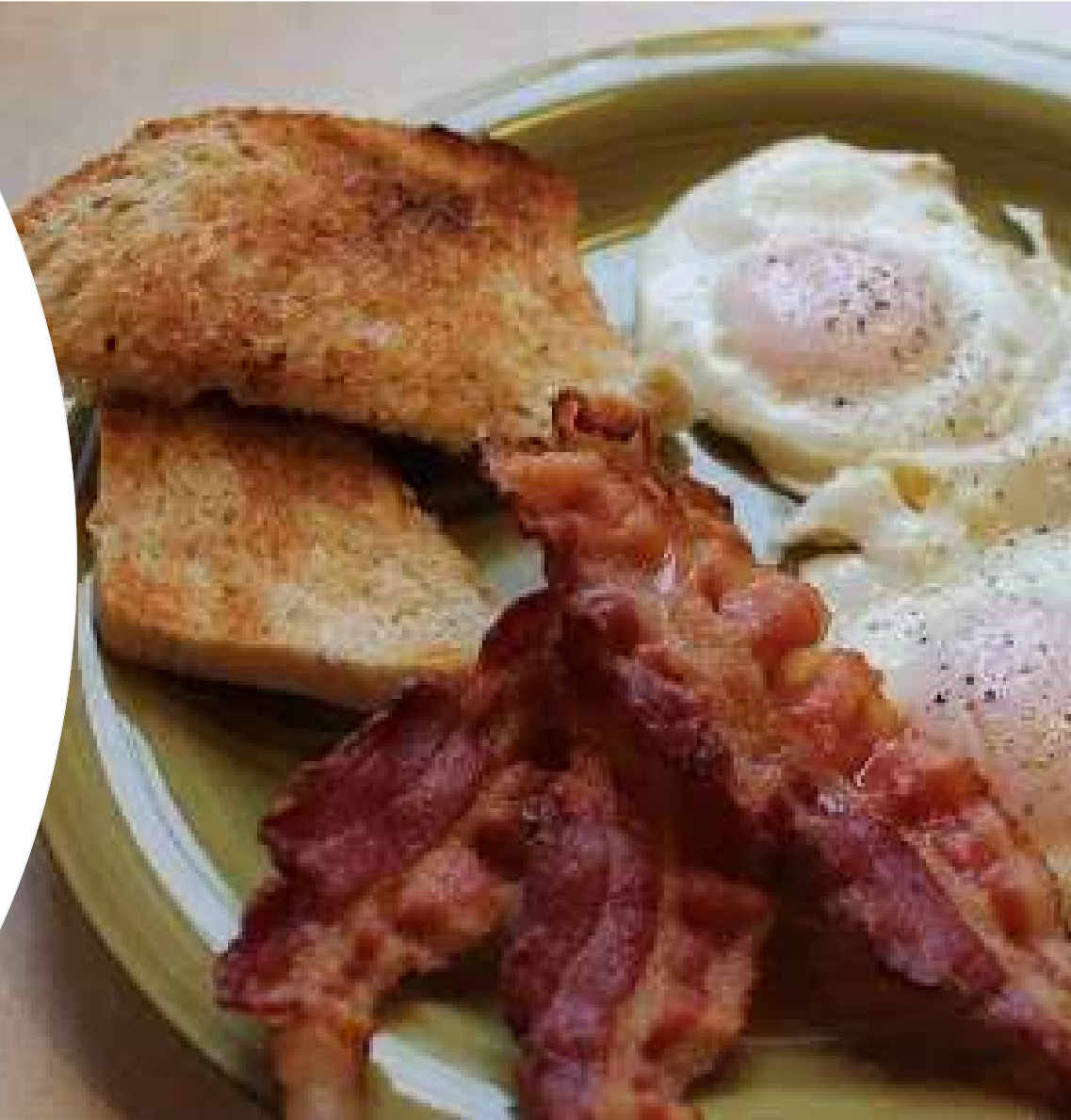
August Egg Farm SE Outbreak 2025

- 134 cases
- 38 hospitalized
- 1 death
- 10 states
- Feb 24 to Jun 06, 2025
- Organic and cagefree farms in Hilmar CA
- Reason for break - ????



Summary

- US egg producers have overcome a big problem with SE and continue to provide a very safe, nutritious product
- Improvements of SE control are still needed by smaller producers
- All producers need to continue to keep up vigilance to suppress SE using all tools available.



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