Salmonella
National Poultry Improvement Plan
Washington State Regulations

Lyndon Badcoe BVSc, MVS, DVSc,
Avian Health Veterinarian and Epidemiologist
Outline

- Describe Pathogenesis of Salmonellosis in Poultry
- Review History of Salmonellosis and NPIP in USA
- Present New NPIP Testing Requirements
- Outline the Current Washington State Poultry Import Requirements
- Discuss Proposed Changes to Washington State Poultry Import Regulations
Pullorum or “bacillary white diarrhea” caused mortality of up to 85% in young chicks.
Infected chicks, become carriers, lay infected eggs.
Stained antigen, whole blood test.
S. pullorum is a host specific avian pathogen.
National Poultry Improvement Plan was developed to improve breed quality and control pullorum disease.
Overview of Pullorum-Typhoid

- Symptoms:
  - White diarrhea
  - Pasted vent
  - Huddle together
  - Lameness
  - Difficulty breathing
  - Blindness

- Nearly all chicks with P-T die
  - Chicks that survive, become adult “carriers”
1930’s… ~70 years ago, Pullorum Disease killed a lot of poultry
   - Prevented farmers from raising poultry
Poultry farmers developed a plan to eliminate Pullorum Disease in the U.S.
   - National Poultry Improvement Plan (NPIP)
Created a test for carriers
   - ~20 years later the disease was eliminated in commercial flocks
Pullorum Disease Today

- *Today* – Pullorum Disease *still* exists in the U.S.!
- 1990 Epizootic of pullorum in single, integrated broiler operation involving 5 States
- **Washington State**: Last Pullorum bacteria cultured in 1987 from Yakima County
- **Washington State**: Okanogan County, Salmonella pullorum micro-agglutination test positive turkey (1:80 dilution) August, 2009
NPIP

- Voluntary national program in collaboration with state and federal departments of agriculture and industry representatives
- New diagnostic technology improves poultry and poultry products in USA
- Provides certification that poultry and poultry products destined for interstate and international shipments are free from specified diseases
NPIP in Washington State

- Washington is an NPIP ‘Pullorum-Clean State’
  - 49 Participants:
    - Commercial producers: 9
    - Subpart E producers: 40
  - Definition of Subpart E:
    - Game birds
    - Waterfowl
    - Backyard or small producers
      - Exhibitors/fanciers
      - Pets
      - Production/small business
Washington State
P-T Requirements

- **WAC 16-59-030**: All poultry going to public exhibition, including exotic, and game birds, but excluding waterfowl, doves, and pigeons must:
  a) Come from U.S. Pullorum-Typhoid Clean or equivalent flocks; or
  b) Have had a negative pullorum-typhoid test within ninety days before going to public exhibition

- Without WAC 16-59 Washington State could not protect poultry producers from losses due to an avian influenza outbreak
  - Fair market value of birds lost to AI
  - Reimbursement for egg loss
  - Cost of cleaning & disinfecting premises and equipment
Pathogenesis of Egg Contamination by Salmonella Enteritidis

(a) Salmonella oral intake
- Gut colonization
- Systemic spread
- Ascending infection

(b) Penetration of Salmonella through egg shell and membranes
- Salmonella in faeces or vagina

(c) Internal contamination of the eggs through infection of reproductive organs

- Ovaria
- Infundibulum
- Infundibulum infection of yolk membranes
- Magnum
- Magnum infection of albumen
- Isthmus
- Isthmus infection of shell membranes
- Shell gland
- Shell gland infection of egg shell

(d) Eggs post lay
- Survival and growth in albumen and on the vitelline membrane
- Motility towards and penetration through the vitelline membrane
- Extensive growth in yolk
History of Salmonella Enteritidis in USA

- Eggs recognized as a major source of Salmonella enteritidis infections 1988
- NPIP initiated “Salmonella enteritidis Clean Program” for egg-type breeders in 1989
Salmonella Enteritidis in Broiler Chickens
United States, 2000–2005

- USDA FSIS saw a three-fold increase in SE in broilers from 2000 to 2005
- FoodNet showed association between eating chicken and sporadic SE infection
- Chicken also implicated in some outbreaks of SE
- Some interventions to control SE in egg industry applicable to broilers
Salmonella Enteritidis Isolation Rates per 100,000 Population by Region: 1970 – 2006
History of Salmonella Enteritidis
Risk Reduction in Commercial Layers

- 1978-1988: CDC, Increased Salmonella Enteritidis Isolation Rates in People
- 1988: Poultry Research “Emergence of Grade A Eggs as a Major Source of Salmonella enteritidis Infections”
- 1992: US Secretary of Agriculture Declared SE an Emergency
- 1994 - Pennsylvania Egg Quality Assurance Program (PEQAP) initiated
Preharvest HACCP in the Table Egg Industry
Hazard Analysis Critical Control Point System for Enhancing Food Safety

Pennsylvania SE Pilot Project Identified 3 Critical Control Points Correlated with SE

1. Positive Pullets
2. Rodent Population
3. Need for Cleaning and Disinfection Between Flocks

http://pubs.cas.psu.edu/FreePubs/pdfs/AGRS72.pdf
Prevention of Salmonella Enteritidis in Shell Eggs During Production, Storage, and Transportation
USDA NPIP and Auxiliary Provisions
Updated June 2009
Avian Species

16-54-145 Poultry and game birds, including ratites -- Importation and testing requirements.

Washington Imports

Import test requirements

4. Poultry and game birds must:

   (a) Originate from an NPIP participant flock that has met classification requirements for pullorum-typhoid, *Salmonella* enteriditis, and avian influenza; or

   (b) Test negative within thirty days before entering Washington for pullorum-typhoid, *S. enteriditis*, and avian influenza. Serum testing or NPIP member status is also required for the following species:

   (i) Bobwhite quail (*Colinus virginianus*).

   (ii) Coturnix quail (*Coturnix coturnix*).

   (iii) Pure or hybrid Ring-necked pheasant (*Phasianus colchicus*).

   (iv) Chukar (*Alectoris chukar*).

   (v) Hungarian partridge (*Perdix perdix*).
5. Hatching eggs must originate from an NPIP participant flock that has met classification requirements for the diseases listed in subsection (4)(a) of this section. If the parent breeder flock is not an NPIP participant, the parent birds must be tested for the above diseases within thirty days before entry.

6. Turkeys and wild turkeys, their poults, and eggs must originate from a producer who is participating in the mycoplasmosis control phase of the NPIP or must have been tested serologically negative for *M. gallisepticum* and *M. synoviae* within thirty days of entry.

Exemptions to import health requirements.

7. Doves, pigeons, and poultry destined for immediate slaughter are exempt from the certificate of veterinary inspection and testing requirements.

Check with the State Veterinarians Office for before importing into Washington
(360) 902-1878
WSDA Regular Rule-Making Process

- Preparing a CR-101 Pre-proposal Statement of Inquiry
- Publishing and Mailing Notices
- Drafting Rules
- Filing a CR-102 Proposed Rule-Making Notice
- Accepting Public Comments
- Filing a CR-103 Rule-Making Order to Adopt the Permanent Rule

http://agr.wa.gov/lawsrules/Rulemaking/ruleprocess.aspx#regular
## Proposed WA State Regulations for Salmonella Enteritidis

<table>
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<tr>
<th>Disease Control Classifications</th>
<th>Poultry Type</th>
<th>Egg-Type Chickens</th>
<th>Meat-Type Chickens</th>
<th>Turkeys</th>
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<td>Salmonella enteritidis</td>
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Summary and Conclusions

- Risk from S pullorum persists, particularly in backyard flocks
- Reduction in risk from SE in poultry requires interdisciplinary efforts involving government, industry, consumers, and academics
- Washington State Rules and Regulations Provides Opportunity for Comment from Industry and Consumers
Contact

Lyndon Badcoe BVSc, MVS, DVS
Avian Health Veterinarian and Epidemiologist
Washington State Department of Agriculture
1111 Washington St. SE
Olympia WA 98504

Office phone: 360-725-5763
Fax: 360-902-2087
Cell phone: 360-507-6219
E-mail: LBadcoe@agr.wa.gov