



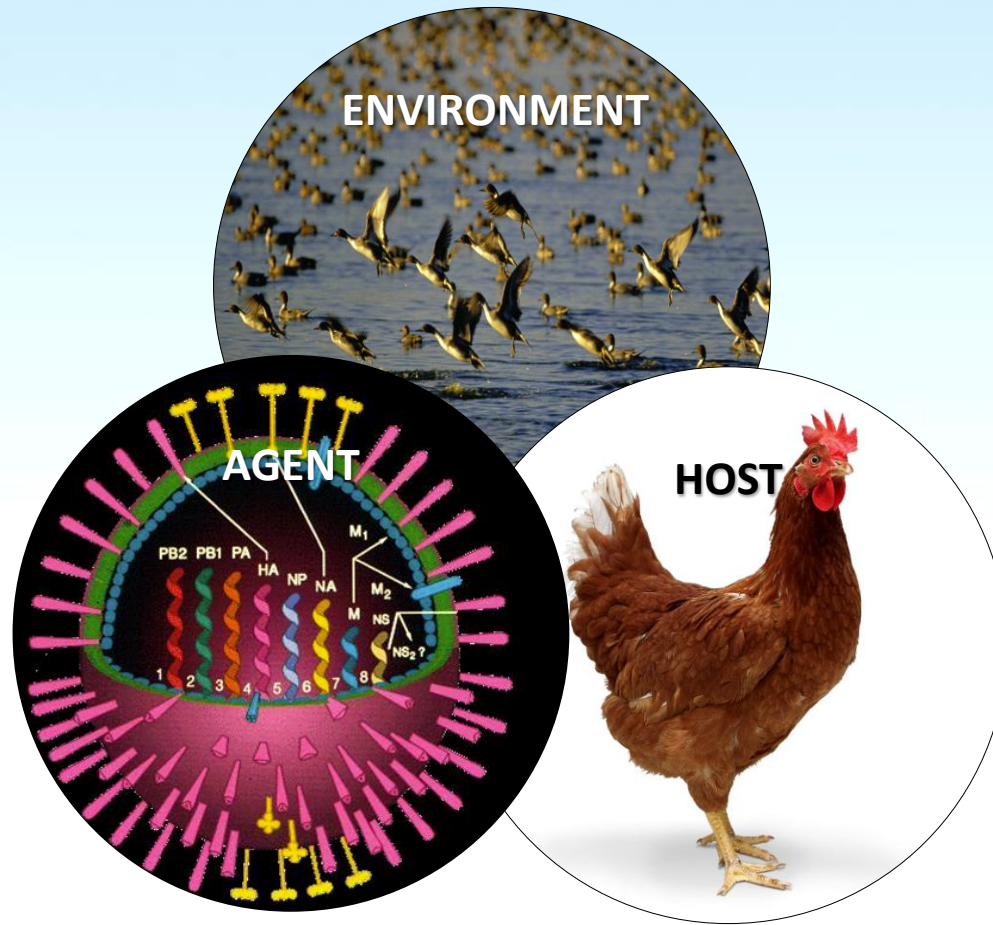
Poultry Diseases and Biosecurity

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San Jose CA

Triad of disease



Presentation overview

- I. Newcastle disease (ND)
- II. Avian influenza (AI)
- III. Salmonellosis
- IV. Biosecurity

I. Newcastle disease (ND)

- ND has historically affected flocks in Southern CA
- 1971:
 - 1,341 flocks
 - 12 mill birds destroyed
 - \$56 million eradication costs
- 2002-2003:
 - Started in BYF, spread to commercial birds
 - 3.6 mill birds destroyed
 - \$161 million eradication costs

Since May 18, USDA has confirmed 388 cases of vND in California, including 116 in San Bernardino County, 229 in Riverside County, 42 in Los Angeles County and 1 in Ventura County. USDA also confirmed 1 case in Utah County, Utah

February 1, 2019

California

Riverside

Commercial table egg layer

aphis.usda.gov

I. Newcastle disease (ND)

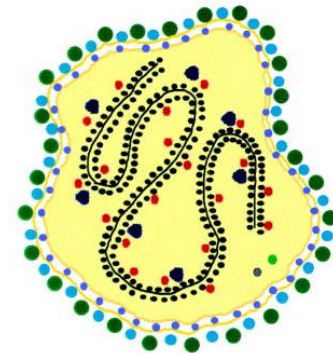
Etiology

- Respiratory, digestive and nervous disease caused by a Paramyxovirus
- Affects many domestic and wild avian species
- Poultry is extremely susceptible
- Endemic (Central America, some regions of South America, Africa, Asia)
- Difficult to recognize due to the different clinical presentations depending on the different virus types

I. Newcastle disease (ND)

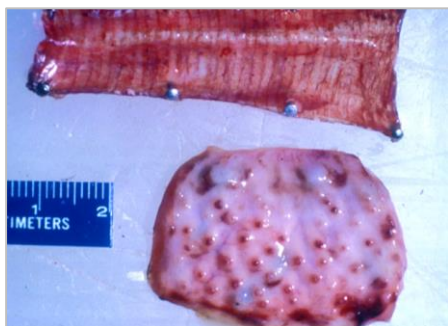
Etiology

- Pathotypes: (Beard and Hanson, 1984)
 - **Velogenic NDV:** acute respiratory and neurologic disease with high mortality
 - **Mesogenic NDV:** milder version with mortality just in young chicks
 - **Lentogenic NDV:** mild or inapparent respiratory infections (Live vaccines B1, La Sota, Clone 30, VG GA etc.)
- Zoonotic potential limited to conjunctivitis and influenza-like symptoms in humans



I. Newcastle disease (ND)

Clinical signs and pathology



I. Newcastle disease (ND) Clinical progression



I. Newcastle disease (ND)

Prevention and control

- **BIOSECURITY** impedes the introduction of the disease to your flock
- Live vaccines (**LaSota or B1**) when close contact to waterfowl, endemic zones, or outbreaks are occurring in the same geographical zone
- LIVE VACCINES APPLIED OCULARLY AND NOT VIA WATER, SPRAY OR INJECTED

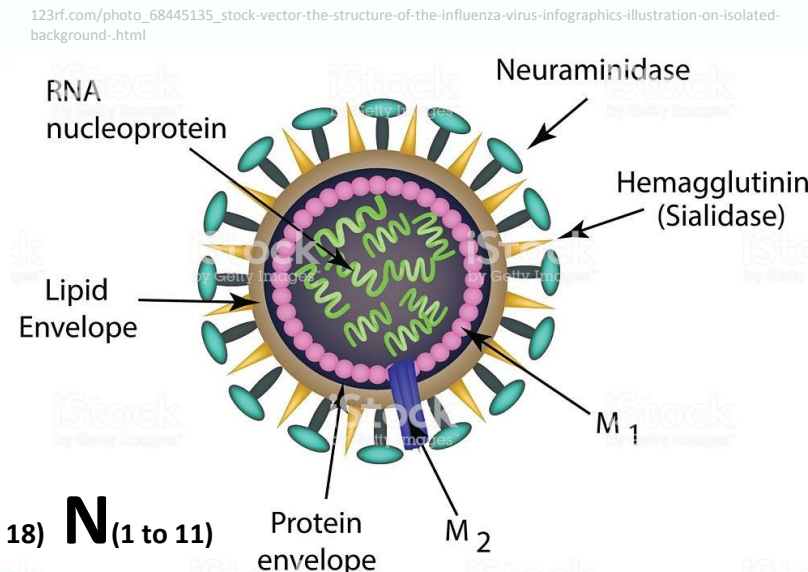
<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/veterinary-biologics>



Dr. Mark Bland

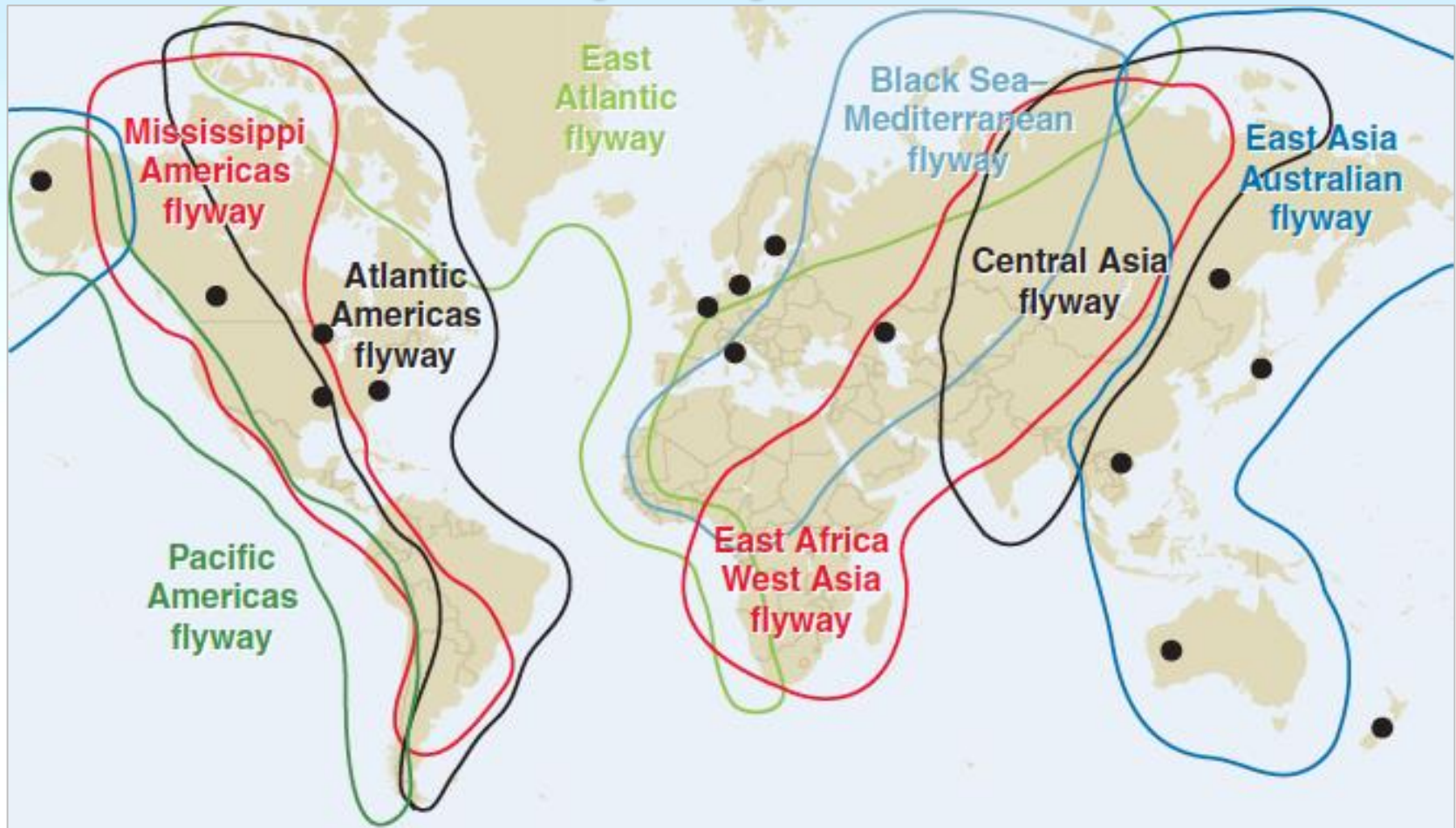
II. Avian Influenza (AI)

- Type of influenza caused by viruses adapted to birds
- Variability
 - Mutations and recombination events
- Receptors
 - Host range and tissue tropism
 - $\alpha 2,3$ sialic acid links (avian-type)
 - $\alpha 2,6$ sialic acid links (human-type)
- Ducks and pigs play a role as mixing vessels
- Zoonotic potential



II. Avian Influenza (AI)

Waterfowl flyways and their role



Olsen et al., 2006

II. Avian Influenza (AI)

Highly pathogenic (HPAI) vs low pathogenic (LPAI)

According to **OIE** (World Organization for Animal Health
Terrestrial Animal Health Code)

HPAI (H5-H7): severe clinical signs and high mortality in birds

LPAI: little or no clinical signs in birds

- Tested in chickens at the laboratory
- Molecular sequencing

All HPAI viruses have H5 or H7 hemagglutinins, but not all viruses that have H5 or H7 are HPAI

II. Avian Influenza (AI)

Clinical signs

- Incubation period is highly variable from 3 to 21 days
- Clinical signs are extremely variable between LP and HP
- **LPAI:**
 - Mild to severe respiratory signs (coughing, sneezing, rales, lachrymation)
 - Decreased egg production
 - Decreased water and feed consumption
 - Diarrhea
 - Usually mild or asymptomatic



II. Avian Influenza (AI)

Clinical signs

- **HPAI:**

- Death without signs
- Nervous signs
- Cessation of egg production in 6 days
- Necrosis, edema and hemorrhages in the comb and wattles
- Pneumonia
- Cutaneous hemorrhages in the skin of the shanks



III. Salmonellosis

- Any infection of poultry with bacteria from the genus *Salmonella* which may result in disease or be of a public health significance

S. Pullorum & *S. Gallinarum*:

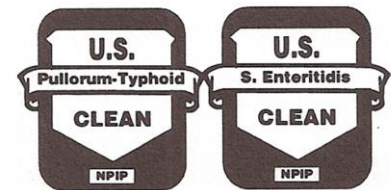
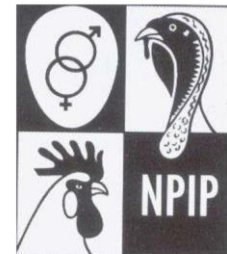
- Host-specific
- Egg and horizontally transmitted
- Non-motile

Non-host adapted *Salmonella spp*:

- Not host-specific
- Egg and horizontally transmitted
- Motile

NPIP small flocks

The Objective of the National Poultry Improvement Plan is to provide a cooperative Industry-State-Federal program through which new technology can be effectively applied to the improvement of poultry and poultry products throughout the country

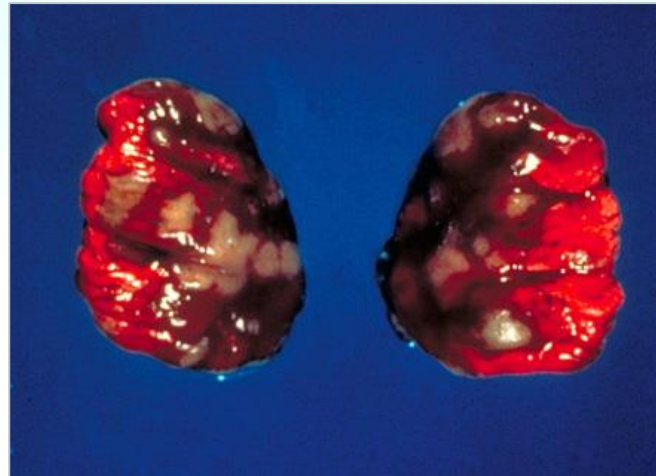


III. Salmonellosis

Paratyphoid *Salmonella*

- Motile *Salmonella* – flagella
- Major public health significance – food-borne disease
- Poultry products are associated with *Salmonella* outbreaks in humans – cook well!
- Poultry are asymptomatic intestinal carriers
- > 2300 serovars of *Salmonella enterica*. About 10% of these have been isolated from poultry species
- Most common paratyphoid infections in poultry of public health concern are due to *S. Enteritidis*, *S. Typhimurium*, *S. Heidelberg*, *S. Hadar* and *S. Senftenberg*

III. Salmonellosis Lesions (when present)



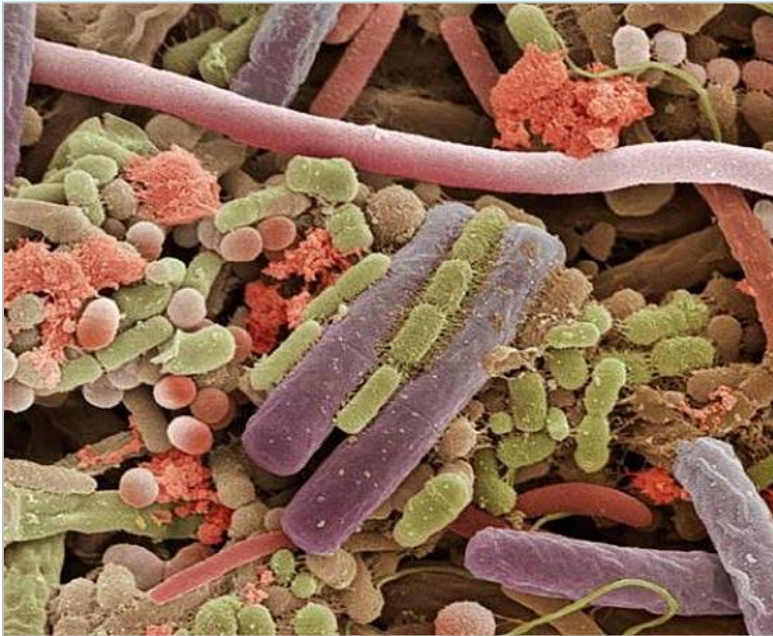
III. Salmonellosis

Prevention

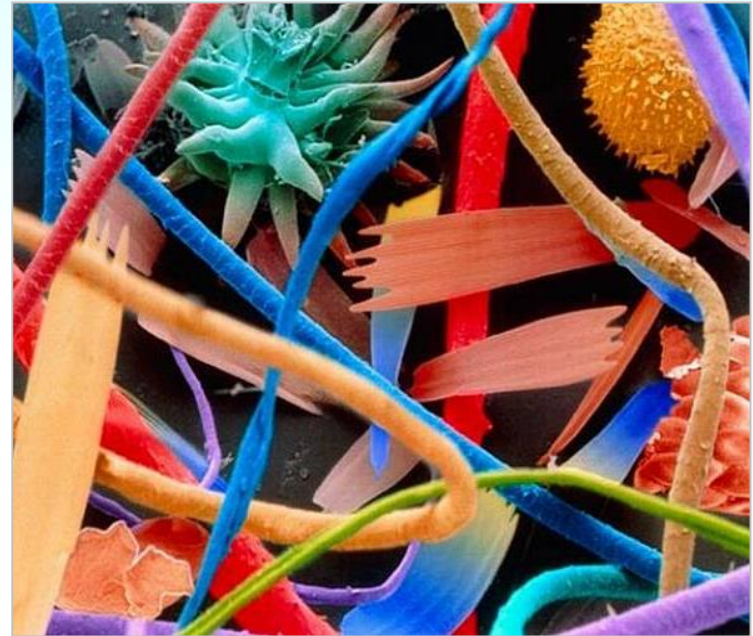
- Start with *Salmonella*-free flocks – test or ask testing when buying them
 - NPIP hatcheries
- Biosecurity: sanitation, disinfection, wild bird and rodent control
- Vaccines
- Surveillance, sampling
- NO COMMINGLING WITH BIRDS (SLEEPING, KISSING) –
ZOONOSIS

IV. Biosecurity

- Measures to reduce or eliminate the introduction of viruses, bacteria or parasites in the poultry environment

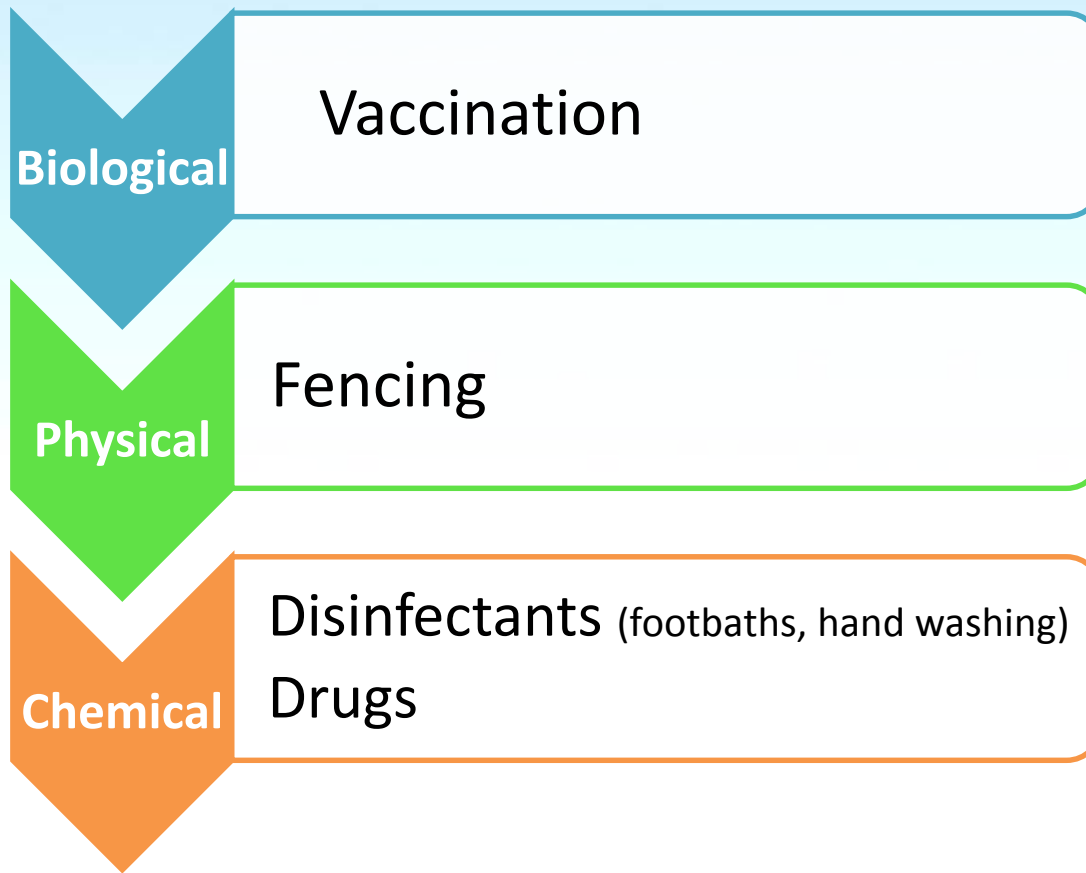


Bacterial population on the tongue



House dust – Cat fur, human hair, plastic and cloth fibers, pollen, insects, etc

IV. Biosecurity



IV. Biosecurity Components

1. Isolation
2. Traffic control
3. Cleaning and disinfection

IV. Biosecurity

1. Isolation



<http://calag.ucanr.edu/Archive/?article=ca.v067n04p203>

IV. Biosecurity

2. Traffic control



Backyard Flock Biosecurity

- **Don't** allow other animals in the coop or run, including other chicks.
- **Use** dedicated footwear and a foot bath. **Most** diseases are transferred by footwear contamination.
- **Keep** feeders and waterers clean and covered.
- **Protect** yourself. Use hand sanitizer and put on clean clothes after handling chicks.
- **Know** your chickens. Recognize unusual behavior.
- **Control traffic.** Keep all visitors out.

Unless It Lives in the Pen, **DON'T** Let It In!

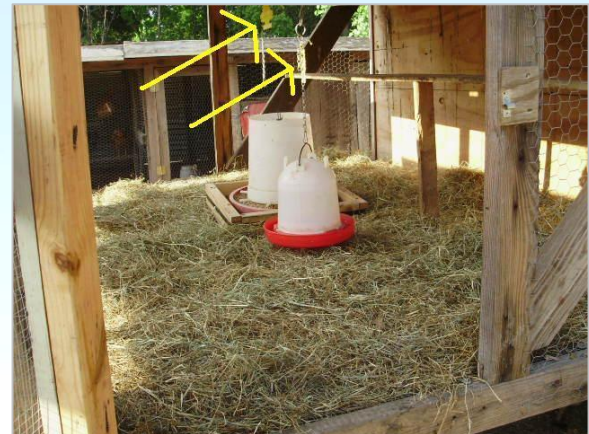


www.AlabamaAvianInfluenza.com

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IV. Biosecurity

3. Cleaning and disinfection

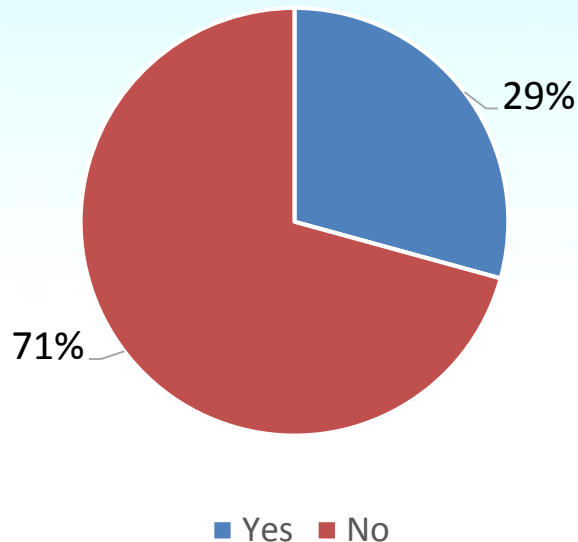


IV. Biosecurity

Backyard poultry biosecurity and antibodies against respiratory diseases

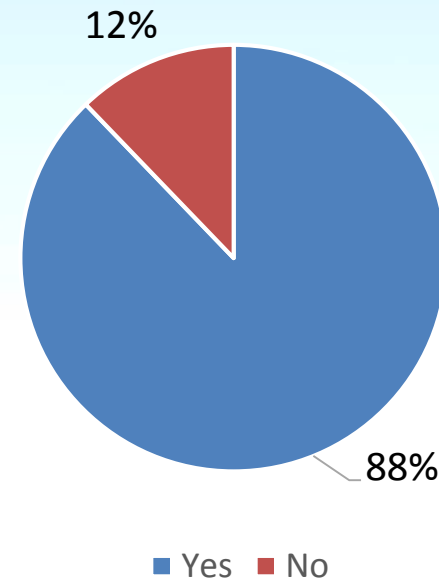
Derksen et al., 2018

Do you have specific footwear for working around your chickens?



Exclusive shoes use reduce the risk of certain diseases such as MG, MS and *Salmonella*

Can wild birds enter your coop?



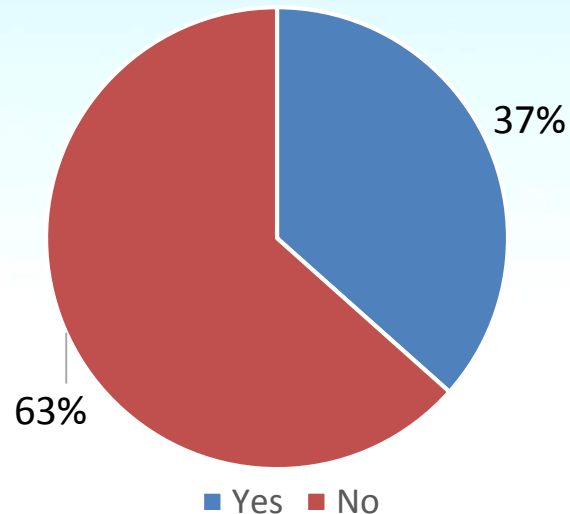
Reduced interaction with wild birds decrease the incidence of NDV and MG antibodies

IV. Biosecurity

Backyard poultry biosecurity and antibodies against respiratory diseases

Derksen et al., 2018

Do you use a lab/vet to diagnose mortality?



Working with diagnostic laboratories is crucial and demonstrates your commitment with animal health

IV. Biosecurity

Practical biosecurity for backyard owners

- Obtain your chicks from a reputable source
- Encourage the hatchery to vaccinate chicks against MDV
- Do not allow chickens to enter to your home as 'visitors'
- Avoid commingling
- Do not have more chickens than the ones you can handle
- Use clothes specifically for working with chickens, especially shoes
- Wash hands thoroughly before and after working with chickens
- Every time you introduce new birds quarantine them
- Separate sick birds from healthy birds
- If sufficient land, rotate them scratch the soil and let the sun act.
- Foot baths (Difficulties)
- Veterinarians are high risk for disease transfer
- You need to be meticulous in following procedural biosecurity...
- Create an annual clean and disinfect time

CAHFS laboratory



- <http://cahfs.ucdavis.edu/>
- Google – CAHFS
- \$20 per group of 2
 - Flocks with less than 1000 birds

Questions?

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