



Disease transmission and practical biosecurity

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Questions?



Poultry Ponderings

A Quarterly Newsletter Summarizing Poultry Related Work at UC

University of California
Winter, 2016
Edition 7

POULTRY PONDERINGS

A QUARTERLY NEWSLETTER SUMMARIZING POULTRY RELATED WORK AT UC

Backyard Chicken Ecotoparasite Study

Amy Murillo and Brad Mullens
UC Riverside, Department of Entomology

We examined 100 backyard birds throughout southern California between June and August 2015 for parasites living on or near the birds. Four of 20 premises were ectoparasite free. Lice were the most common parasites found, with 6 different species detected: *Menacanthus stramineus* (chicken body louse), *Goniocotes gallinae* (fluff louse), *Lipeurus caponis* (wing louse), *Menopon gallinae* (shaft louse), *Menacanthus cornutus*, and *Cuclotogaster heterographus* (head louse). One flea species, the sticktight flea (*Echidnophaga gallinacea*) was found. Three parasitic mite species were recovered: *Ornithonyssus sylviarum* (northern fowl mite), *Knemidocoptes mutans* (scaly leg mite), and *Dermanyssus gallinae* (chicken red mite). The parasite diversity found on backyard chickens was greater than what is commonly found on commercial chicken flocks in the US. This study is published in the Journal of Medical Entomology, 2016.



Photo of Dr. Mullens and PhD student Amy Murillo washing parasites off of a bird (photo by A. Yzaguirre)

Common Lice Found In Backyard Chickens

Chicken lice (not to scale) collected in survey. (A) *Menopon gallinae*; (B) *Menacanthus cornutus*; (C) *Menacanthus stramineus*; (D) *Goniocotes gallinae*; (E) *Lipeurus caponis*; (F) *Cuclotogaster heterographus*.









PLEASE CONTACT MAURICE PITESKY AT MEPITESKY@UCDAVIS.EDU OR 530-752-3215 WITH QUESTIONS OR COMMENTS


Poultry Ponderings-Summer 2015

Nutrient-Rich By-Products for Layers

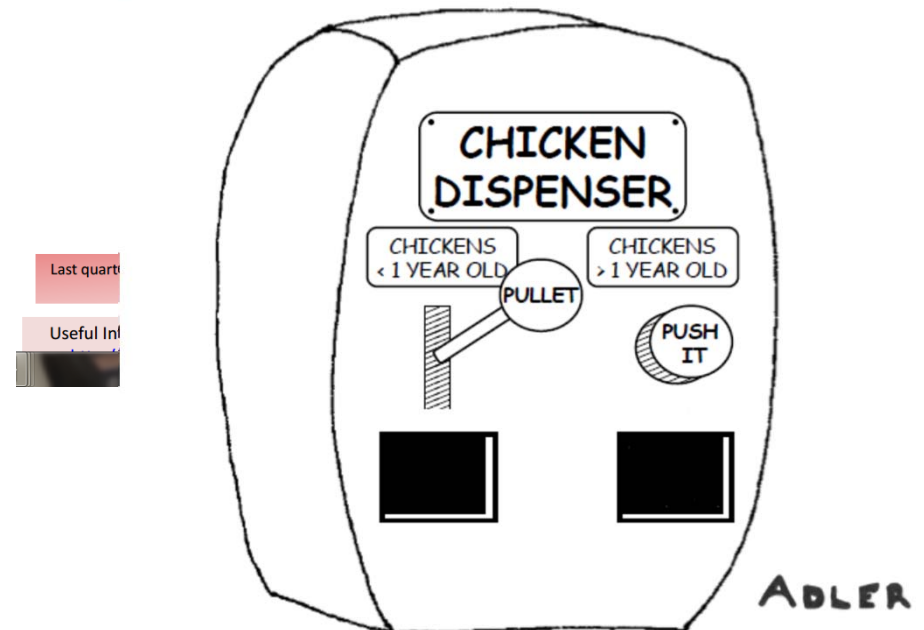
Gabriela Pedroza and Annie King

Want deep yellow egg yolks? Give your layers dried excess broccoli leaves and stems. Results of published research with broccoli stems and leaves meal (BSLM) indicated that adding up to 9% in diets of 42-week-old layers increased yolk pigmentation and had no negative effects on production measurements compared to that of a corn/soy diet. We fed 15% BSLM in the diet of 35-week-old layers. It produced significantly darker yolks but had no negative effects on weight gain, feed consumption, egg weight, egg shell thickness and Haugh units (overall egg shell quality) compared to that of the control. While carotenoids in BSLM deepened yolk color, its glucosinolates can cause severe growth depression; therefore, greater than 12% - 15% BSLM is not recommended.

The research is part of a broader study to use nutrient-rich dried horticultural by-products (remaining after harvest and processing of fruits, grains, nuts, seeds and vegetables) in diets of layers. Use of BSLM and other by-products is important because California produces an estimated 96% of the broccoli and over 50% of other fruits and vegetables for the US along with vast quantities of unused material, often deposited in landfills and possibly negatively affecting the environment.



When fed discarded broccoli stems and leaves, hens deposit carotenoids in their yolks, causing a rich yellow-orange yolk color



California Backyard Poultry Census



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California Backyard Poultry Census

Goal

Survey based and anecdotal observations demonstrate that backyard poultry ownership is increasing nationally and in California. At the same time, California's ability to provide resources to backyard poultry owners is limited. In addition, there are no effective ways to communicate with backyard poultry owners in a coordinated fashion. To address these issues, the UC Davis School of Veterinary Medicine and Cooperative Extension have made a short geo-survey (~2minutes) designed for the backyard poultry community. Results will help further clarify the location and number of backyard poultry farms in California. Furthermore, email addresses and other address information will help facilitate communication between poultry experts and backyard poultry enthusiasts. An example on the value of bridging the communication gap is being able to notify backyard poultry owners of an Avian Influenza outbreak. This will be extremely helpful in preventing another large outbreak. For this reason, we sincerely hope you consider participating in this survey.

Note: As veterinarians at UC Davis our interest is in working with Backyard poultry and their owners to improve poultry health. The data in this survey is strictly for outreach purposes. We want to work with you. We are a university not a regulatory agency and therefore our focus is on outreach and education and not regulation and enforcement.

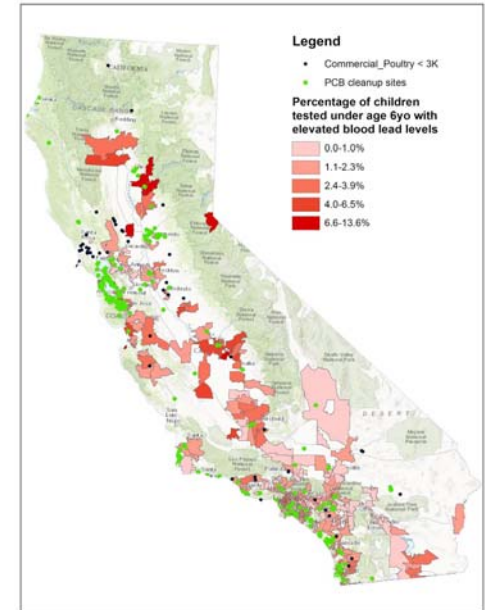
[English Version](#)

[Versión en Español](#)

The California Backyard Poultry Census:



Make Sure Your Poultry are Represented!



Egg Contaminant Testing

Egg Contaminant Testing

If you and your backyard chickens live in (or close to) an area affected by the recent fires in California, you may qualify for free egg contaminant testing provided by the UC Davis School of Veterinary Medicine (UCD SVM)!

Due to the fires, there is concern about backyard chickens ingesting contaminants from the ground and transmitting these to their eggs. UCD SVM is interested in testing eggs from these backyard flocks for various contaminants such as heavy metals, building materials, chemicals, etc.

Results will be shared individually with each owner, and cumulative results will be summarized and made available to the general public.

If you are interested in submitting eggs, please send up to 6 eggs from your flock with the following information to the address below:

Requested information to include:

Address where hens reside
Number of hens in flock
Date eggs were collected

Ship* eggs to:

UC Davis School of Veterinary Medicine
1 Shields Drive
Bldg VM3B Room 4007
Attn: Dr. Maurice Pitesky
Davis, CA 95616

*Please ship eggs inside a carton and wrap the carton with bubble wrap. or ship in a box with packing peanuts.

If you would like assistance with shipping costs or have any other questions or comments, please contact Dr. Maurice Pitesky at the UCD SVM Cooperative Extension at mepitesky@ucdavis.edu or 530-219-1407

Also participate in our fire and contaminant studies

Beginning Farmer & Rancher Development Program

BEGINNING FARMER & RANCHER DEVELOPMENT PROGRAM: **PASTURED/FREE-RANGE POULTRY**

Want to improve your commercial pastured or free-range poultry operation?

Our 1, 2, and 4-day programs offer beginning commercial free-range and pastured poultry farmers (both layers and broilers) the opportunity to learn from experts about how to better raise their flocks!

Topics include health, husbandry, food safety, coop design, land management, marketing, and more! Each workshop include hands-on demonstrations and many opportunities for Q&A and networking!



UC DAVIS
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CE**

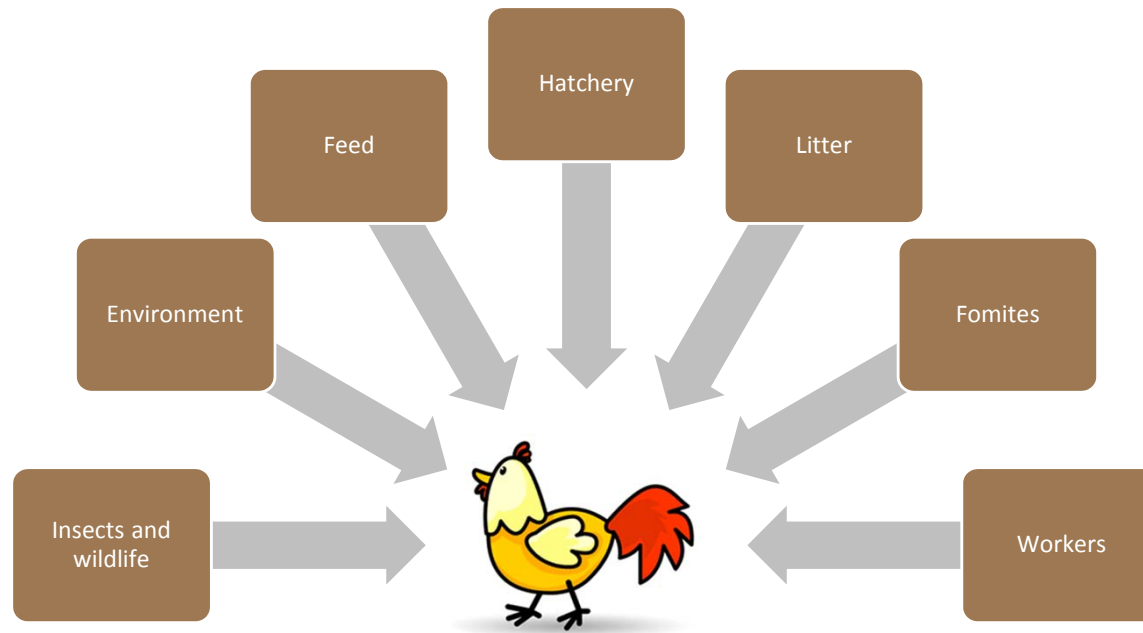


ATTRA
SUSTAINABLE AGRICULTURE
NCAT

Click on this image to go to our Course registration form!

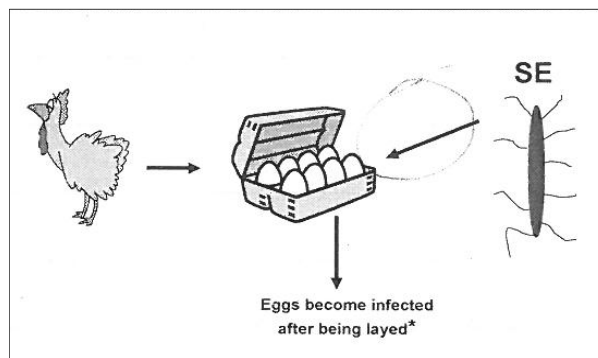
More information to come on later courses. Stay tuned!

Knowledge of Disease Transmission

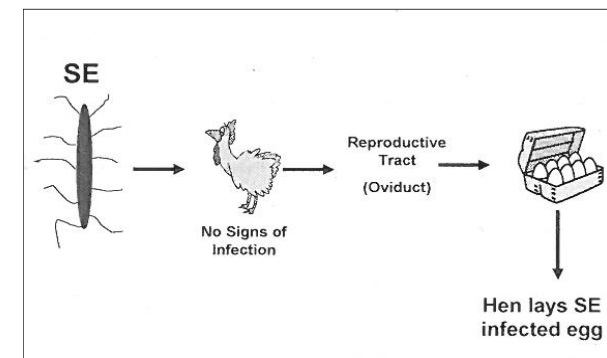


Disease transmission into eggs

Horizontal Transmission



Vertical Transmission

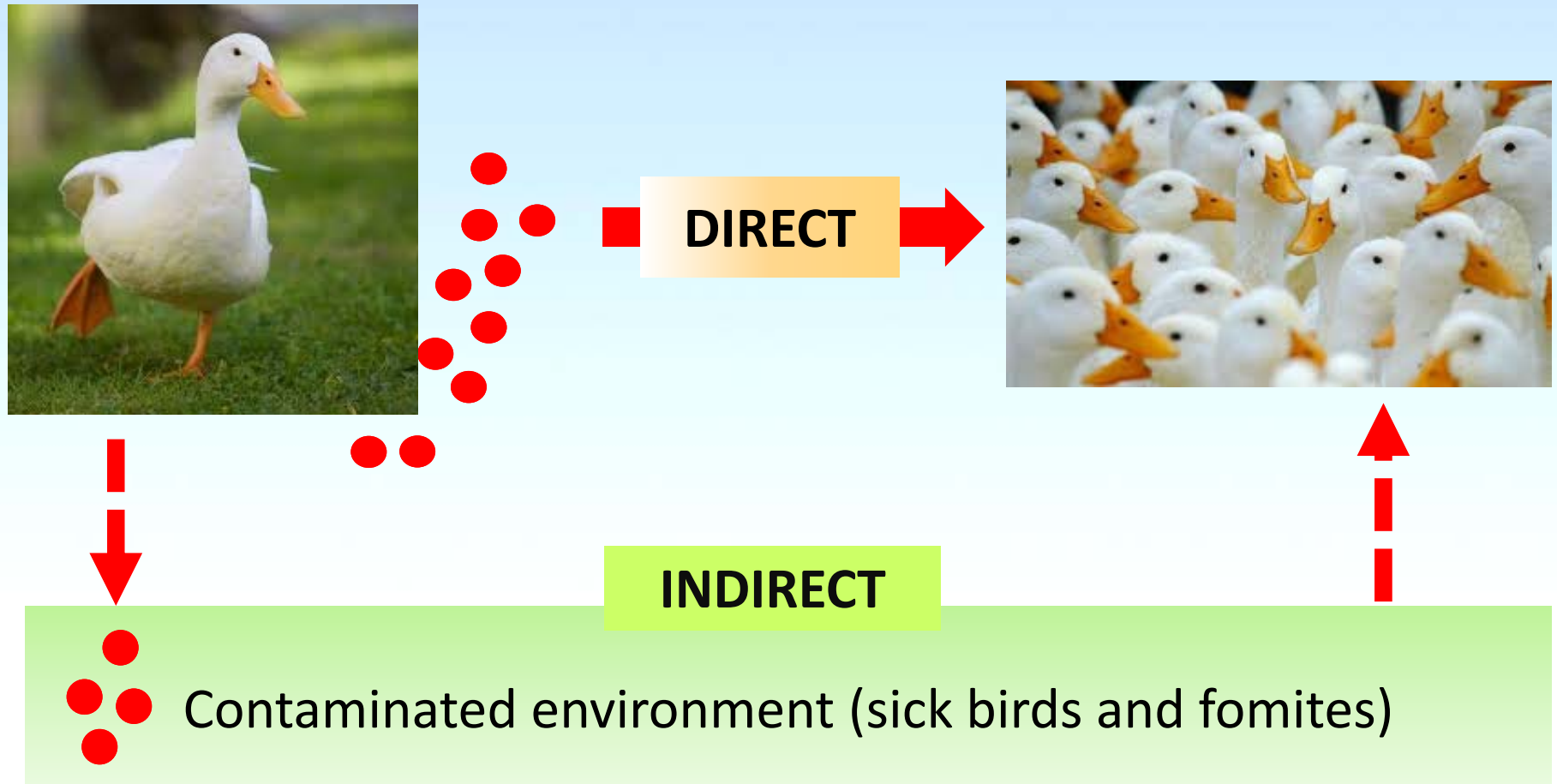


There are multiple hosts and multiple routes of infection

*Activity #1

- What was the source of infection?
 - A. UC Davis people
 - B. Chairs in the room
 - C. Pens, note-pads
 - D. All of the above
- How this infection can be prevented?
 - A. Restricting access to unknown people
 - B. Disinfect hands, use coveralls or dedicated shoes
 - C. Disinfect utensils
 - D. All of the above

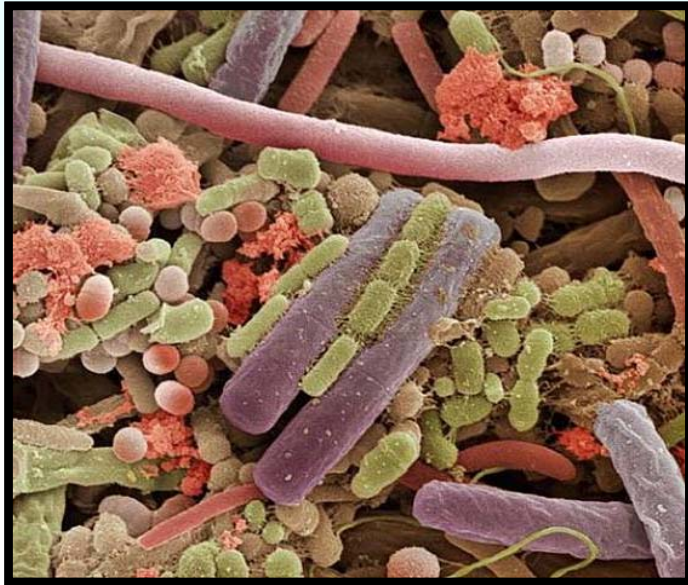
*Methods of pathogen transmission



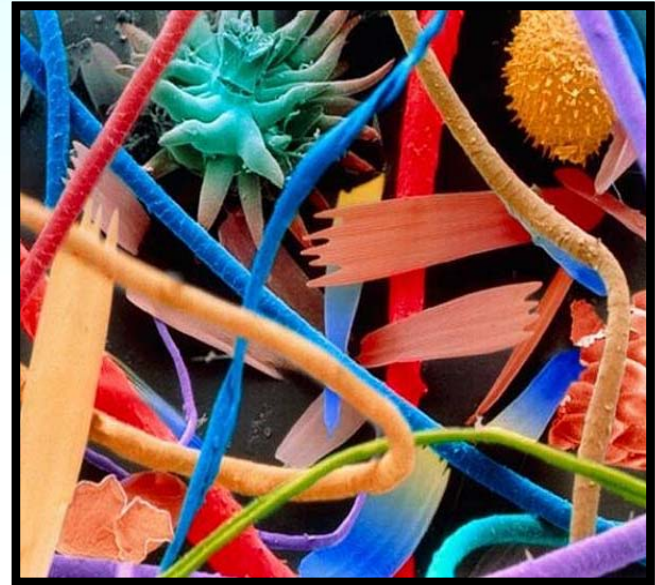
- *What was the method by which you got infected?
 - A. Direct
 - B. Indirect
 - C. Both

Biosecurity

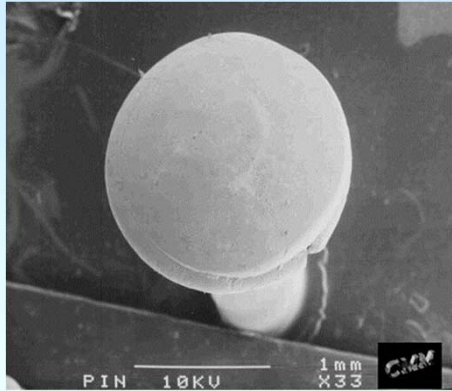
- Measures to reduce or eliminate the introduction of viruses, bacteria or parasites in the poultry environment from???



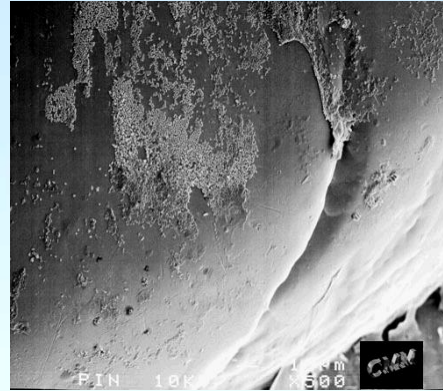
Bacterial population on the tongue



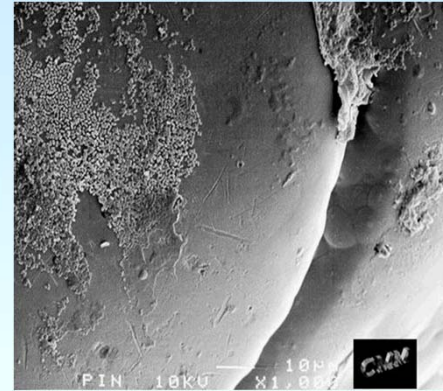
House dust:
Cat furr and human hair – plastic and cloth fibers – pollen – insects, etc.



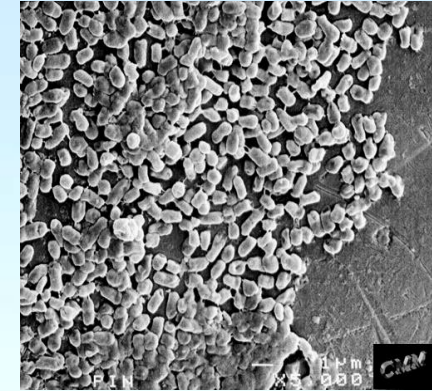
33X



500X



1000X



5000X

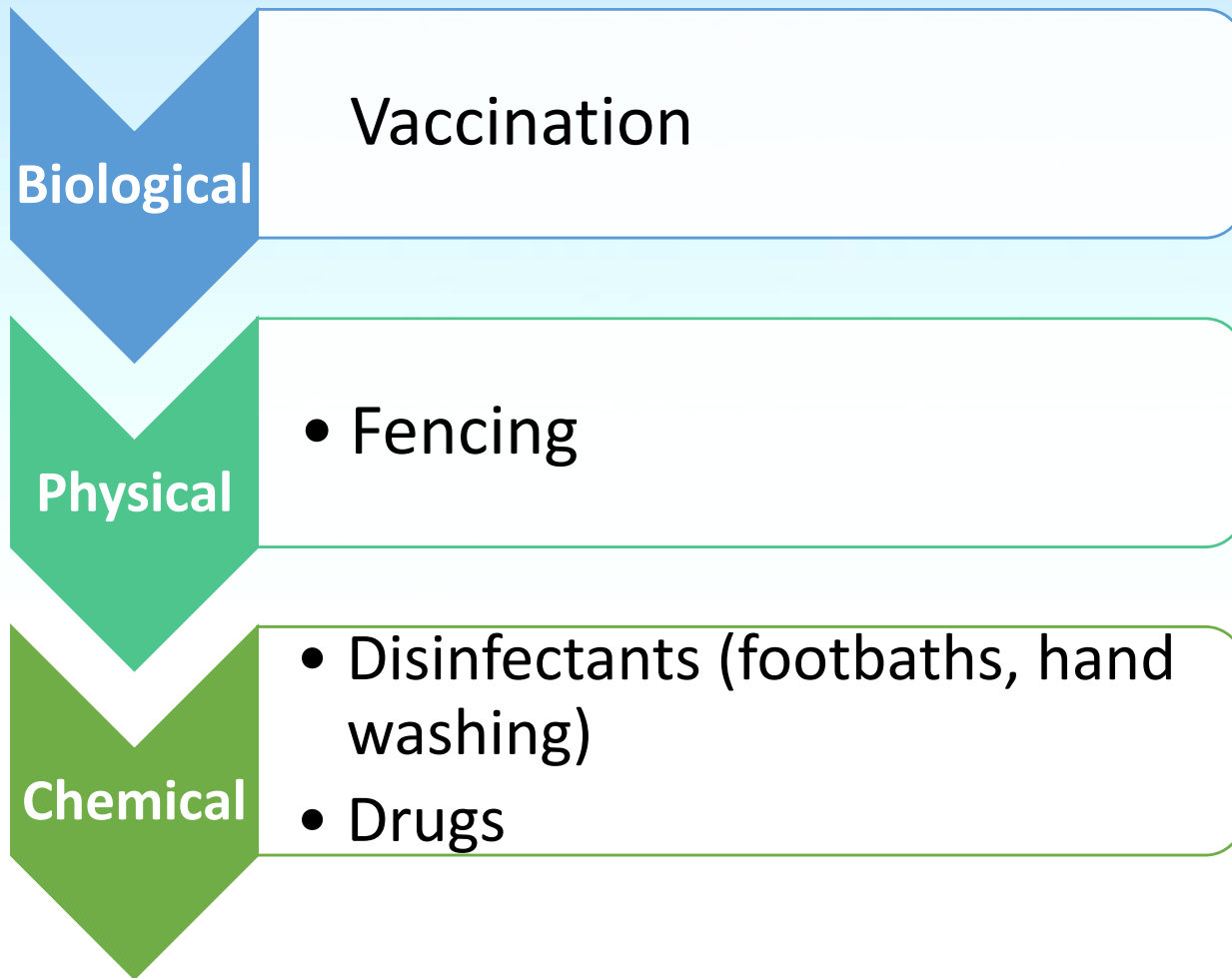


Virus



<https://www.sciencealert.com/bacteria-in-your-coughs-and-sneezes-can-stay-alive-in-the-air-for-up-to-45-minutes>

Biosecurity tools in poultry flocks?



- Who currently uses any of these tools? (A) Yes, (B) No

Characteristics of a good biosecurity program

- Realistic (don't make perfect the enemy of good!)
- Preventative
- Different for every farm
- Needs to be reviewed and enforced

Three components of biosecurity

- Isolation
- Traffic control
- Cleaning and disinfection

Isolation



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

Are backyard birds free of contact with poultry pathogens?

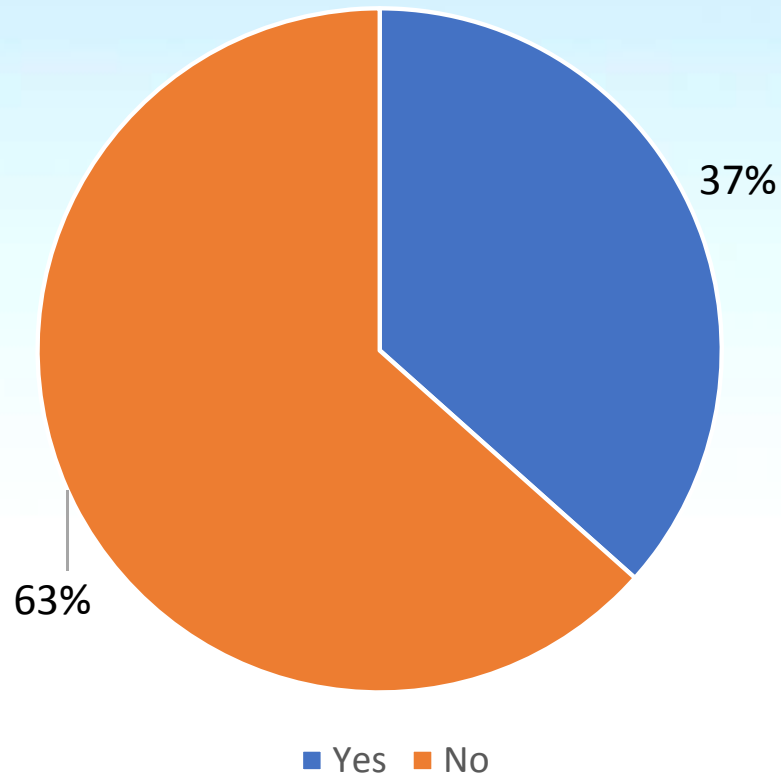
A. Yes

B. No

- **Research:** Backyard flock biosecurity and antibodies against respiratory diseases (Derksen et al., 2017)

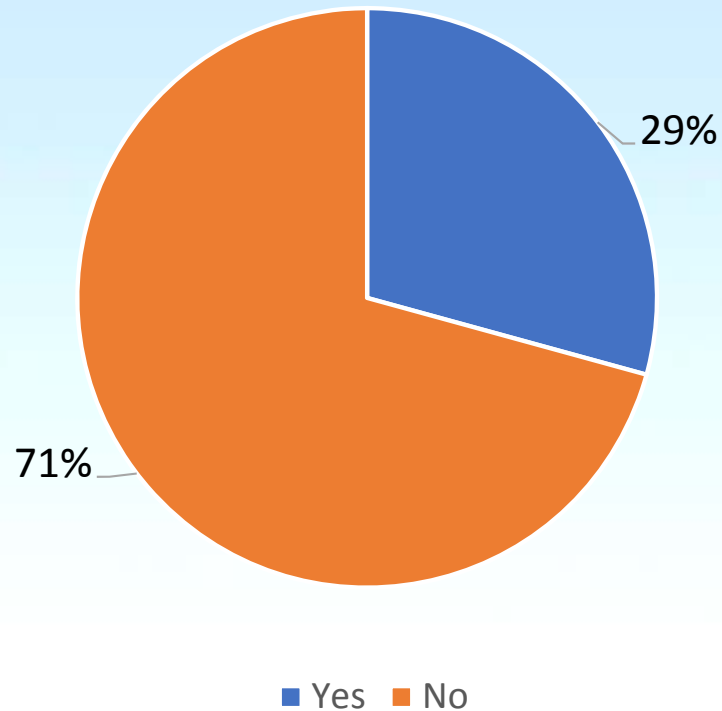
Survey:

Do You Use a Lab/Vet to Diagnose Mortality

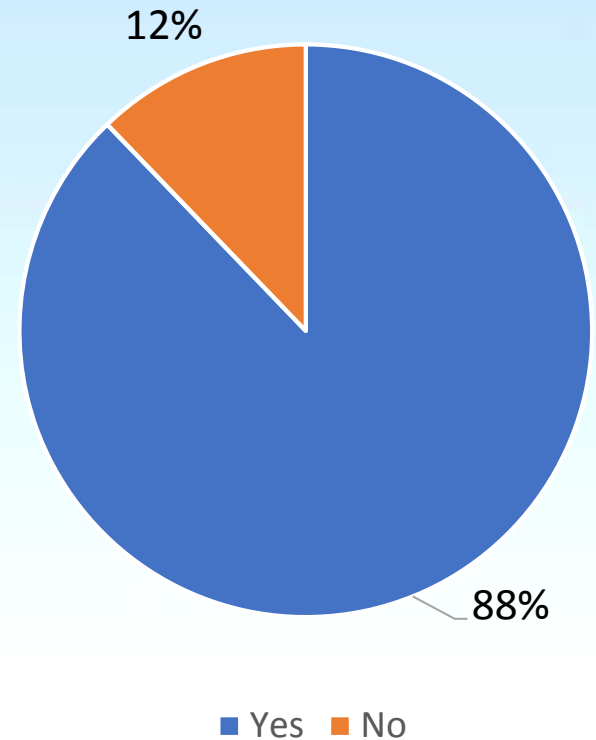


- Working with diagnostic laboratories is crucial and demonstrates your commitment with animal

Do You Have Specific Footwear for Working Around Your Chickens

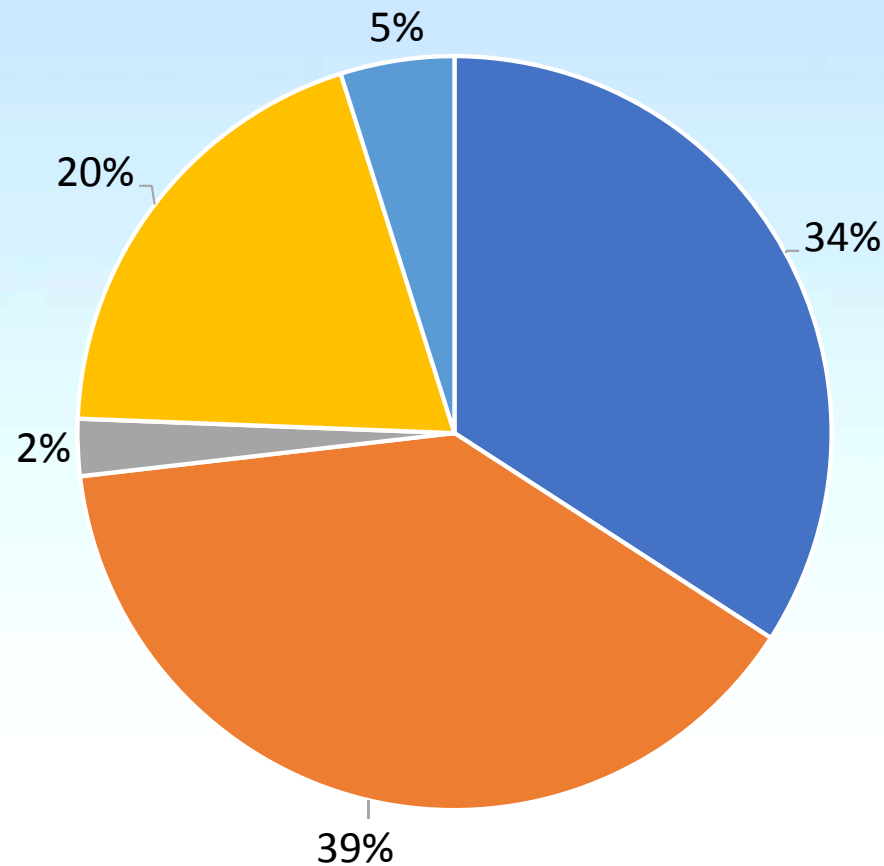


Can Wild Birds Enter Your Coop



- Exclusive shoes use reduce the risk of certain diseases such as MG, MS and *Salmonella*
- Reduced interaction with wild birds decrease the incidence of NDV and MG antibodies

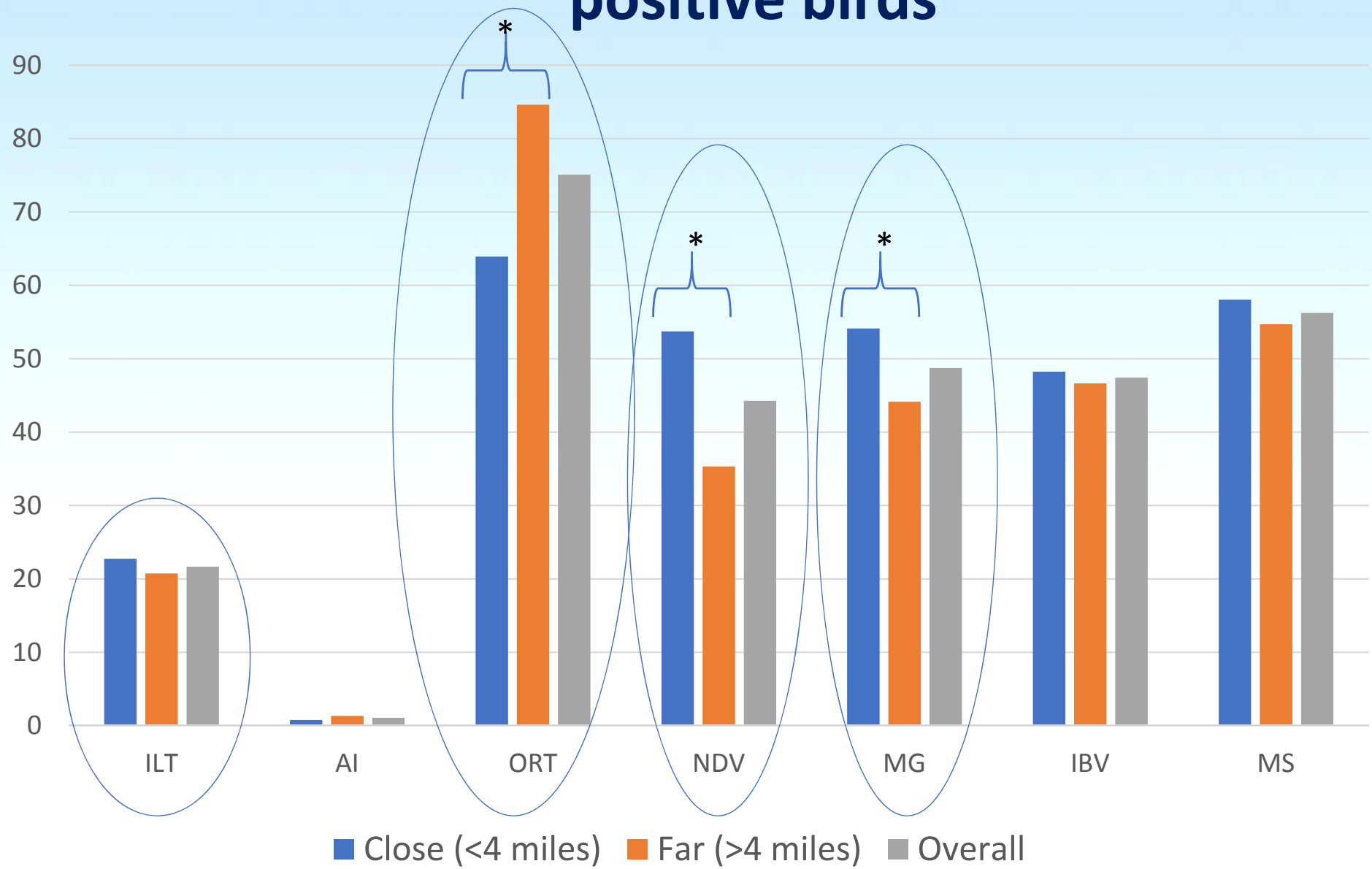
What is the Source of Your Birds



■ Friend ■ Feed Store ■ Hatch Own ■ NPIP Hatchery ■ Rescue

- Some of the chicken sources are not trained in disease prevention
- Importance of NPIP

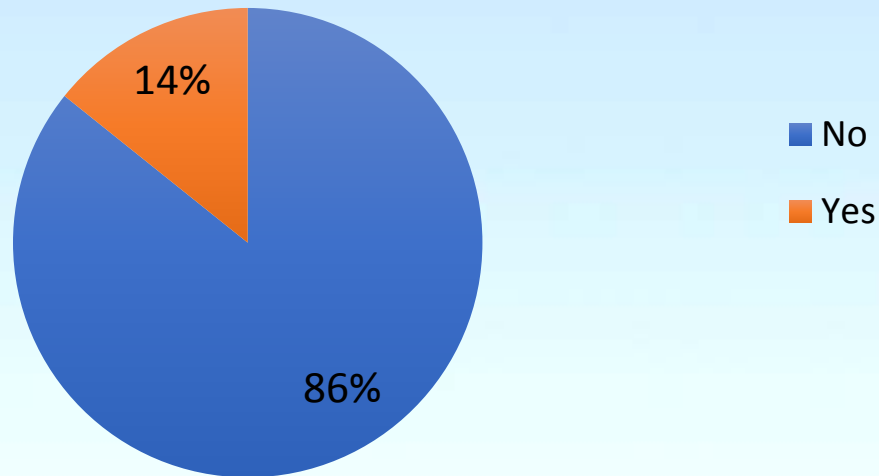
Seroprevalence: percentage of antibody positive birds



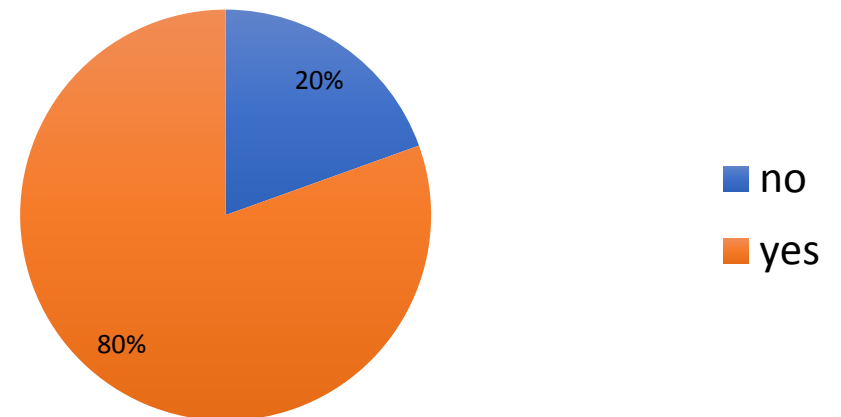
Salmonella in small flocks (Lampron et al., 2018)

- Plate agglutination (*S. Pullorum*) and ELISA (flagellar antigen)
- 41 flocks, 385 samples for ELISA and 540 plate agglutination
- ELISA detects motile *Salmonella* (affect humans)
- Agglutination detects poultry specific salmonella (*S. Pullorum*)

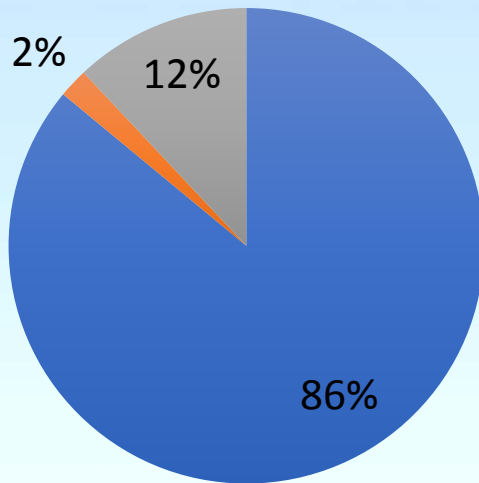
Salmonella Agglutination Positivity (Birds)



Salmonella Agglutination Positivity (Flock)

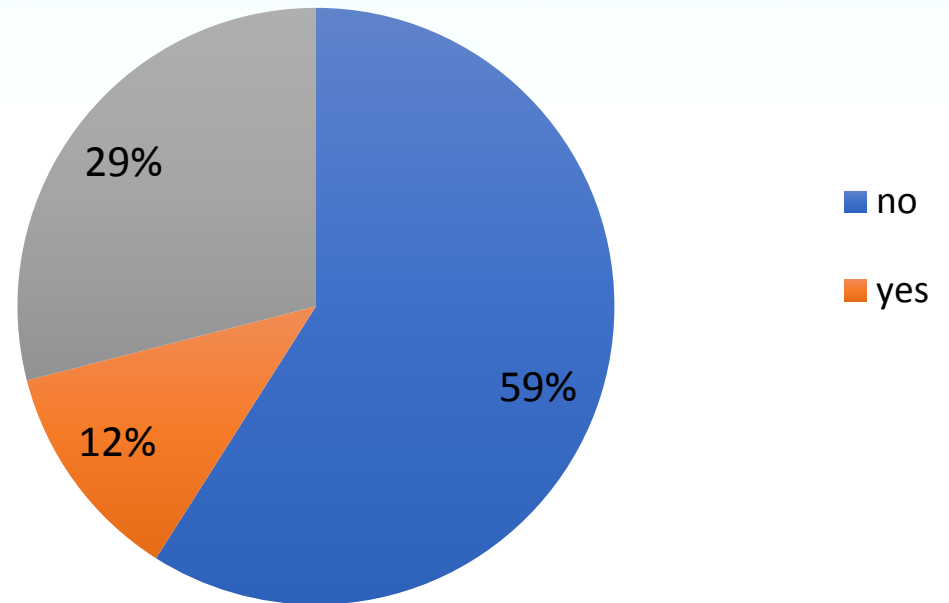


Salmonella ELISA Positivity by Birds



■ no
■ yes
■ suspect

Salmonella ELISA Positivity by Flock



■ no
■ yes

Biosecurity survey associated with salmonella antibody presence

- When dedicated shoes are not used there is an increase in the number of positive samples to salmonella antibodies using ELISA and plate agglutination
- Rodents and wild birds presence is associated with an increase in antibody detection
- Birds obtained from NPIP hatcheries show less positives to both tests

*True (A) o false (B)

- Backyard flocks can be affected by respiratory diseases and Salmonella
 - A. True
 - B. False
- Biosecurity education to backyard flock enthusiasts is needed
 - A. True
 - B. False

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!

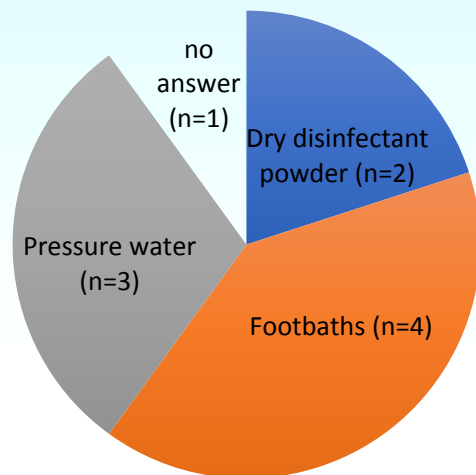


www.AlabamaAvianInfluenza.com

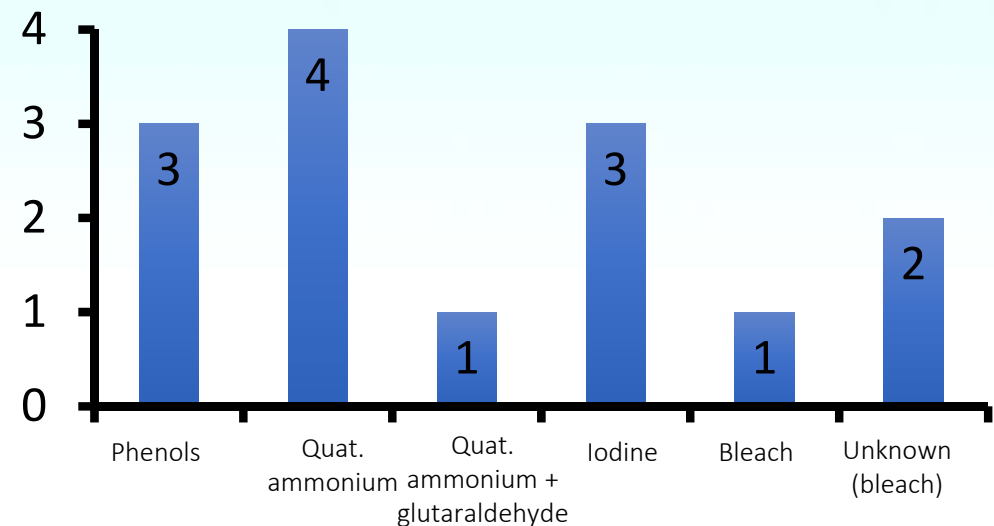
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Research (Hauck et al, 2017): Footbaths / survey on commercial farms

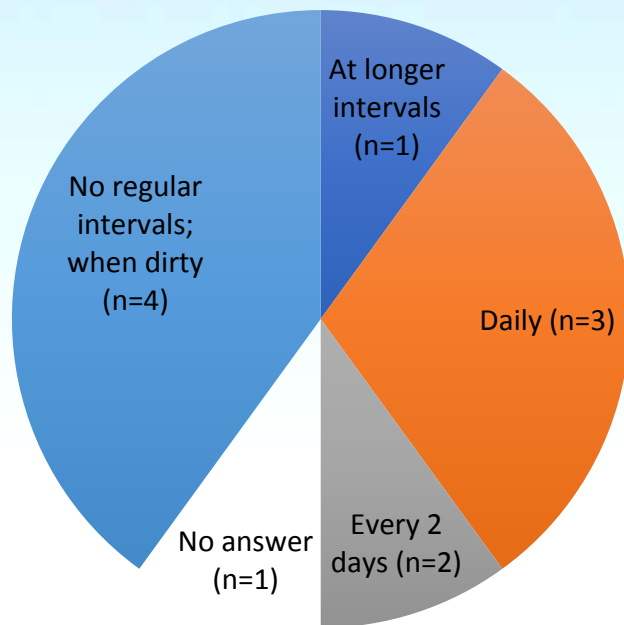
Footbath Type



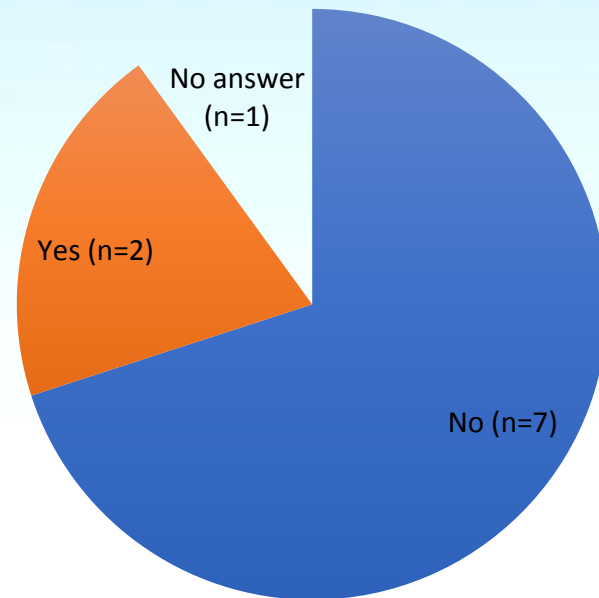
Disinfectants



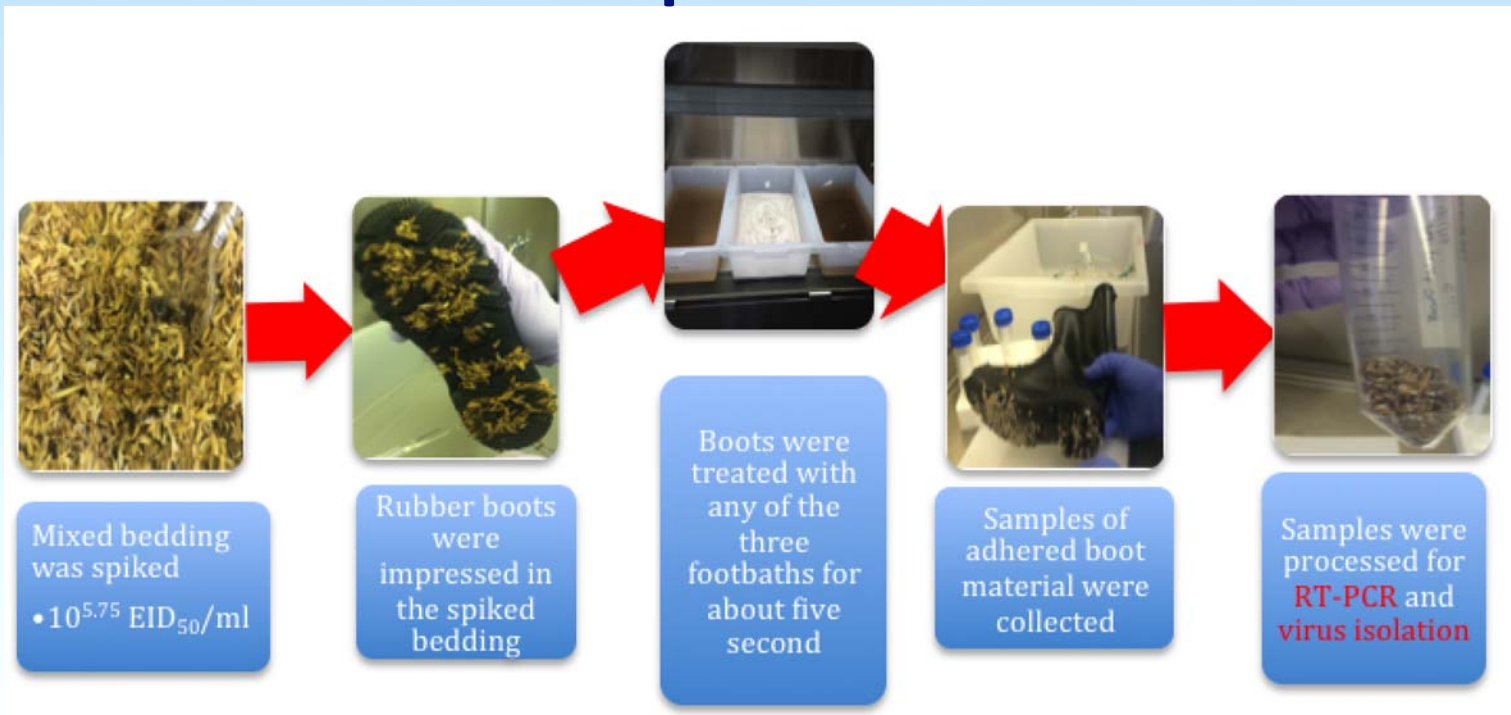
Preparation frequency



Boot scrubbing



Experiment



Results

Day		0		1		2		3	
		LP	HP	LP	HP	LP	HP	LP	HP
Control (feces no disinfectant)	PCR	+	+	+	+	+	+	+	+
	Isolation	+	+	+	+	+	+	+	+
Quaternary ammonia	PCR	+	+	+	+	+	+	+	+
	Isolation	+	+	+	+	+	+	+	+
Quat. ammonia + glutaraldehyde	PCR	+	+	+	+	+	+	+	+
	Isolation	+	+	+	+	+	+	+	+
Bleach powder	PCR	-	-	-	-	-	-	-	-
	Isolation	-	-	-	-	-	-	-	-

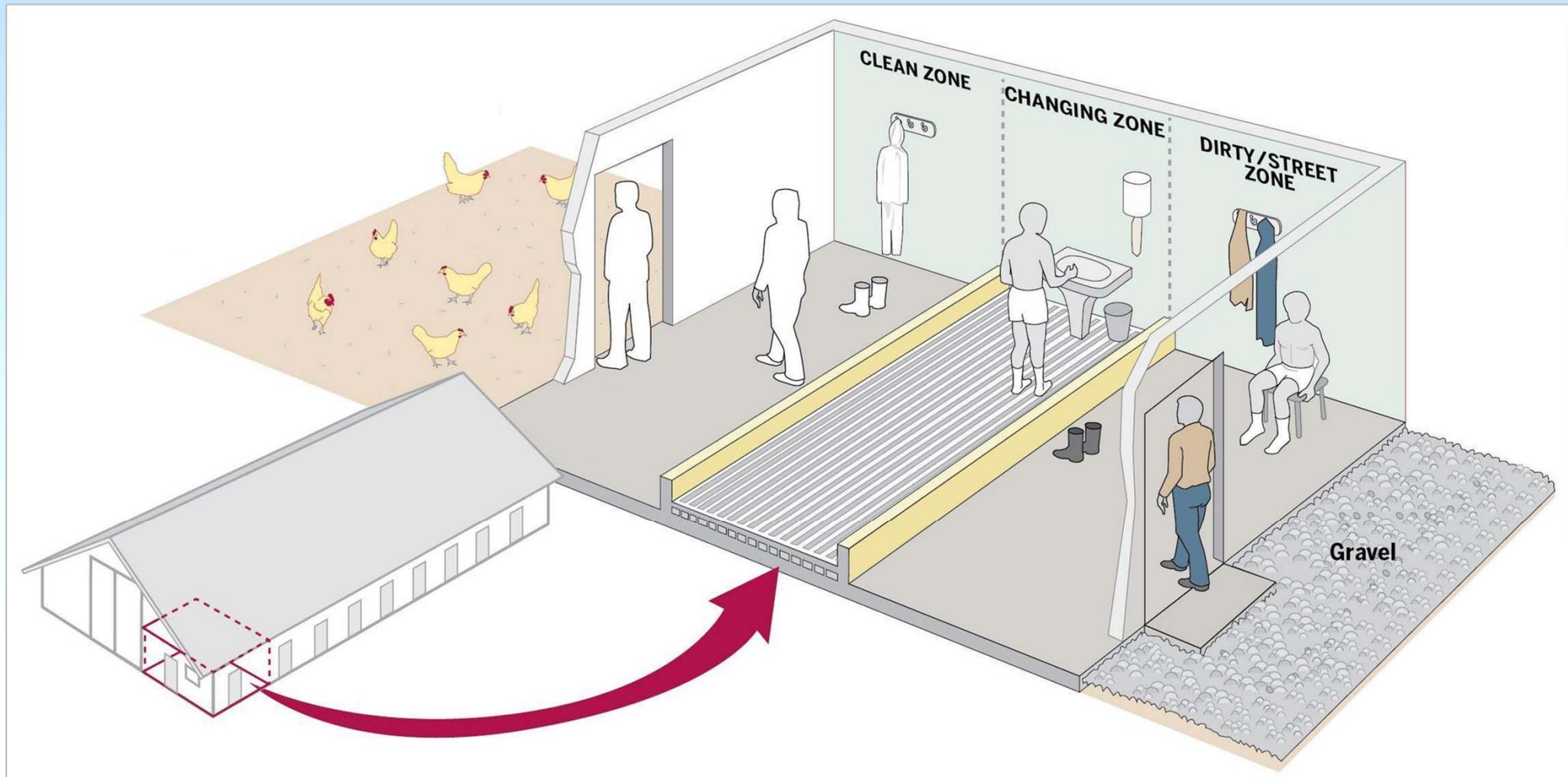
***Are footbaths by itself the best measure to prevent diseases in our flock?**

A. Yes

B. No

***What measures will improve the effectiveness of footbaths?**

- A. Correct disinfectant selection
- B. Frequent maintenance
- C. Boot scrubbing
- D. Asphalt or cement surface
- E. All of the above



A Danish entry is the primary entrance room attached to the production area of the hog barn. It has two sides, “dirty” and “clean”, which are divided by a solid barrier. A place to store clothing and footwear is located on both sides and there are facilities and/or supplies for people to clean their hands. The Danish entry should be the only entrance to the production area that people use.

3. Cleaning and disinfection



Pest control

- Rodents, flies, insects, wild birds and animals
- Constant monitoring is needed
- Involves a strategy
- Chemical and physical



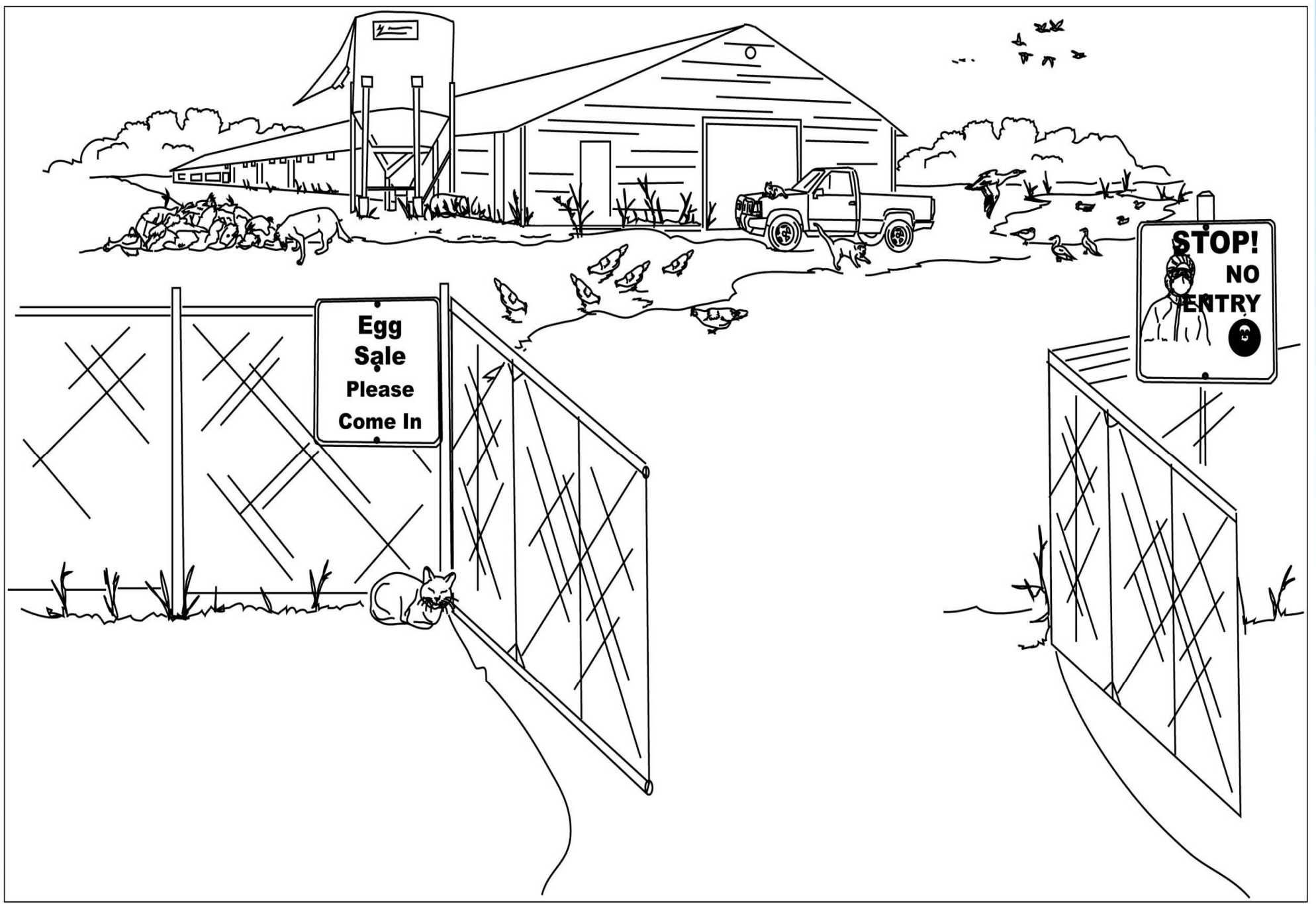
Activity #2

Identifying biosecurity risks

- Analyze the image of the “problem farm”
- Work in groups to identify risks

Share your responses

There are at least 10 biosecurity violations in the image



Key:

1. Dead birds out of the poultry house
2. Poultry house is open, live birds outside
3. Perimetral fences are open
4. Feed silo is open
5. Water accumulation inside the farm
6. Multiple species in the farm
7. Truck in front of the poultry house
8. Weed in the surrounding of the house
9. Cats and dogs
10. Contradictory signs (No Entry v/s egg sales are inside the farm)

Practical biosecurity for BYF 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

*Course evaluation

- How useful you think this seminar was?
 - A. Not useful
 - B. Somewhat useful
 - C. Useful
 - D. Very useful

- How would you grade this seminar from 1 to 5 being 1 bad and 5 excellent?
- A. 1
 - B. 2
 - C. 3
 - D. 4
 - E. 5

Questions?

