Egg Handling and Food Safety

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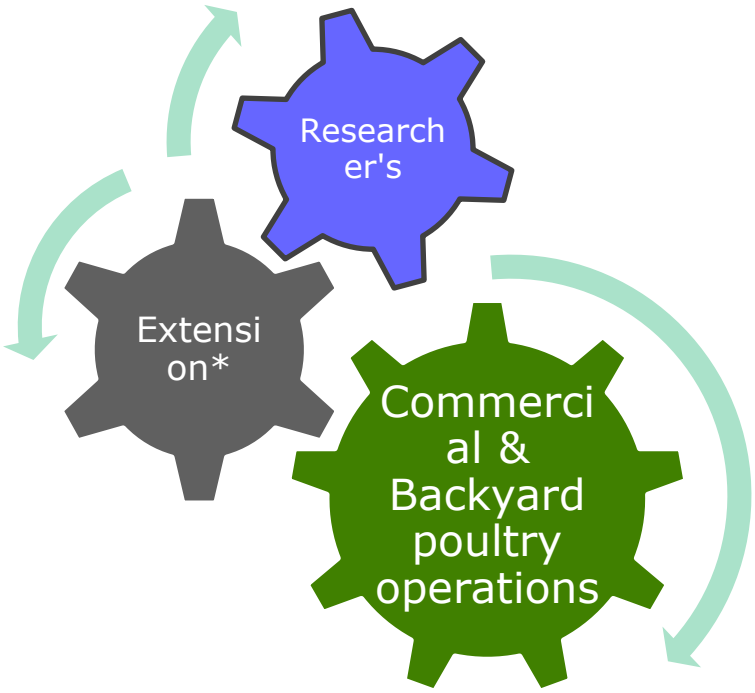
March 2nd 2019

Questions?

What is Cooperative Extension?



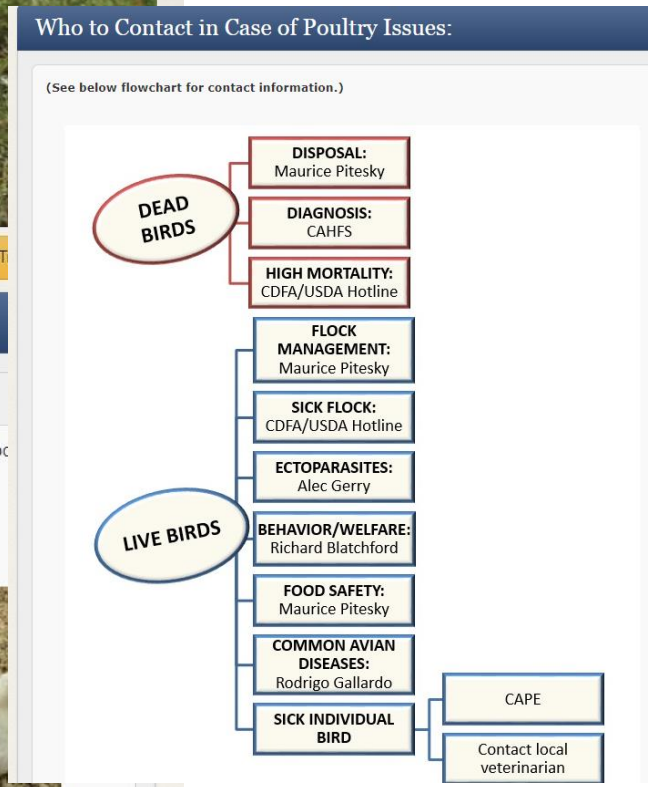
Mission Statement:
Statewide network of researchers and educators focused on the creation and application of knowledge in agriculture

- 200 locally based CE advisors and specialists
- 57 local offices
- 130 campus based CE specialists
- 9 research and extension
- centers
- 700 academic researchers

http://ucanr.edu/

* Extension Specialists, Researchers and Farm Advisors

UCCE Poultry Website



Quarterly Newsletter

UC CE

UCDAVIS VETERINARY MEDICINE

Poultry Ponderings

Edition 14 · Spring 2018

A quarterly newsletter detailing poultry related work at the UC system

Keeping Your Birds Safe from Virulent Newcastle Disease

The California Department of Food and Agriculture (CDFA) has identified several cases of **virulent Newcastle disease** in small flocks of backyard birds in Los Angeles and San Bernardino Counties. The initial case was detected at the UC Davis School of Veterinary Medicine's California Animal Health & Food Safety Laboratory (CAHFS) when a private practitioner submitted a sick bird for testing. All detections are confirmed at the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Services (APHIS) National Veterinary Services Laboratory (NVSL) in Ames, Iowa. This was the first case of virulent Newcastle disease, previously referred to as exotic Newcastle disease, in the U.S. since 2003. CDFA is working with federal and local partners as well as poultry owners to respond to the incident. State officials have quarantined potentially exposed birds and are testing for the disease.

Virulent Newcastle disease is a highly contagious and deadly virus in birds; the virus is found in respiratory discharges and feces. Clinical signs in birds include: sneezing, coughing, nasal discharge, green watery diarrhea, depression , neck twisting, circling, muscle tremors, paralysis, decreased egg production, swelling around eyes and neck, and sudden death.

It is essential that all poultry owners follow good biosecurity practices to help protect their birds from infectious diseases such as virulent Newcastle. These include simple steps like washing hands and scrubbing boots before and after entering a poultry area; cleaning and disinfecting tires and equipment before and after moving them on/off the property; and isolating any sick birds. New or returning birds from shows should be isolated for 30 days before placing them with the rest of the flock. For backyard flock owners, biosecurity measures also include using dedicated shoes and clothes when caring for birds and not wearing those clothes/shoes in other areas.

In addition to practicing good biosecurity, all bird owners should report sick birds or unusual bird deaths through California's Sick Bird Hotline at 866-922-BIRD (2473). Additional information on VND and biosecurity for backyard flocks can be found at *www.cdfa.ca.gov/ahfss/Animal_Health/Newcastle_ Disease_Info.html*

Sick or dead backyard birds can be submitted to CAHFS laboratories for post-mortem examination ($20 plus shipping and handling). Information on this program can be found at: *cdfa.ca.gov/ahfss/Animal_Health/pdfs/CAHFS_NecropsyFactsheet.pdf*

For additional information on who to contact for issues regarding backyard poultry, see: *ucanr.edu/sites/poultry/contact.*

Virulent Newcastle disease is NOT a food safety concern. No human cases of Newcastle disease have ever occurred from eating poultry products. Properly cooked poultry products are safe to eat. In very rare instances people working directly with sick birds can become infected. Symptoms are usually very mild, and limited to conjunctivitis and/or influenza-like symptoms. Infection is easily prevented by using standard personal protective equipment.

If you have any questions, please do not hesitate to call the Animal Health Branch Tulare District Office at 559-685-3500.

—Jennifer McDougle, MVB

Inside this issue:

Questions or Comments?
Contact Maurice Pitesky at:
mepitesky@ucdavis.edu
or 530-752-3215

Editor: Anny Huang

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New Mobile Coop for the UC Davis Pastured Poultry Farm

The new mobile coop designed by Ruby Chen

Meet Ruby Chen, a recent graduate of the UC Davis' civil and environmental engineering program. Ruby is now working for the Fundamentals of Engineering exam. Good luck Ruby! During her last two years of school, Ruby served as the 'lead engineer' at the UC Davis Pasture Poultry Farm where she fixed electric fences, installed solar panels, repaired a mobile coop and dozens of other assorted hands -on engineering duties. But where Ruby really excelled was her design and construction of the Farm's newest mobile coop.

In the continuing quest for the best possible mobile coop – that is, one that is strong, lightweight, inexpensive, and sustainable - Ruby and her civil engineering team members, Lj Tullo and Torynne Dillon, designed a new mobile coop as part of their senior year design experience. Ruby then went on to actually build the coop over the summer. And what a coop it turned out to be!

Strong, lightweight enough that it can be moved by two people, and roomy enough to hold 50 hens. And it is just beautiful to look at. The coop is roughly 12 by 8 feet. It's made of wood, with wire mesh floors to protect the hens from predators while also allowing easy cleaning. The eggs can be quickly harvested using the outer access to the nest boxes and there are enough nest boxes that every hen can be accommodated during the day.

The plans and pictures of critical design features will be available in early fall.

—Deb Niemeier

Accessible nest boxes speed up egg collection

The newest mobile coop design includes a hybrid floor and removable perches for

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Editor: Anny Huang

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 Murillio washing parasites off of a bird (photo by A. Yzaguirre)

Newsletter

Our quarterly newsletter summarizes poultry related work at the University of California. Enter your email below to subscribe!

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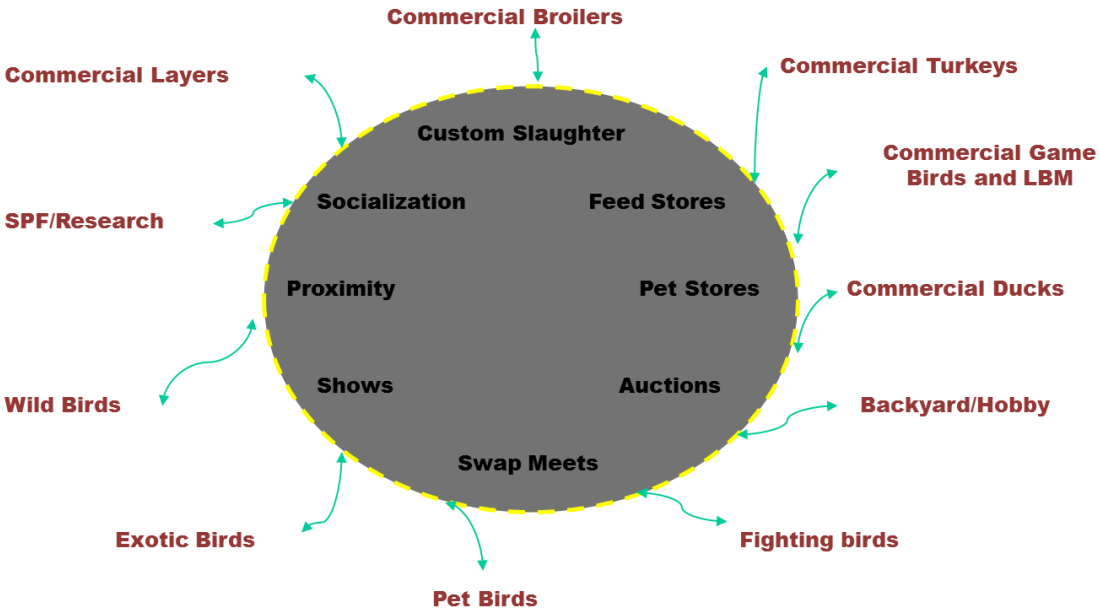
Routes of Disease Transmission



Slide adapted from Dave Castellan

Attention:
Residents in Areas of Active vND Virus Spread

Message from State Veterinarian, Dr. Annette Jones

Due to progression and duration of a virulent Newcastle Disease (vND) outbreak in parts of Southern California, the State Veterinarian has ordered mandatory euthanasia of birds in some neighborhoods within or near:

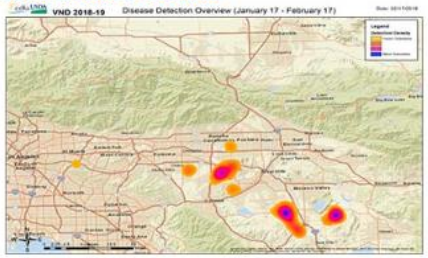
Compton and Whittier (Los Angeles County)
Menifee, Mira Loma/Jurupa Valley, Norco, Nuevo, Perris, and Riverside City (Riverside County)
Hesperia, Muscoy, and Ontario (San Bernardino County)

Unfortunately, even birds and flocks that previously tested negative, but now fall within a designated mandatory euthanasia area, must be euthanized. USDA/CDFA staff will contact affected bird owners with orders specific to their property.

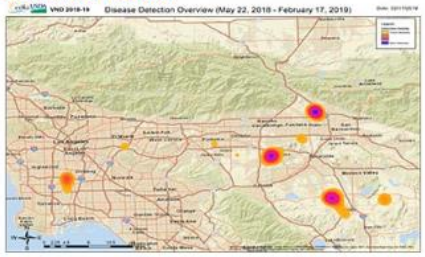
While this action is difficult for all involved, it MUST be done to eradicate VND. Otherwise, the disease will continue to spread and kill additional flocks.

For more information please refer to: **Virulent Newcastle Disease FAQs** or call the Sick Bird Hotline at 866-922-2473

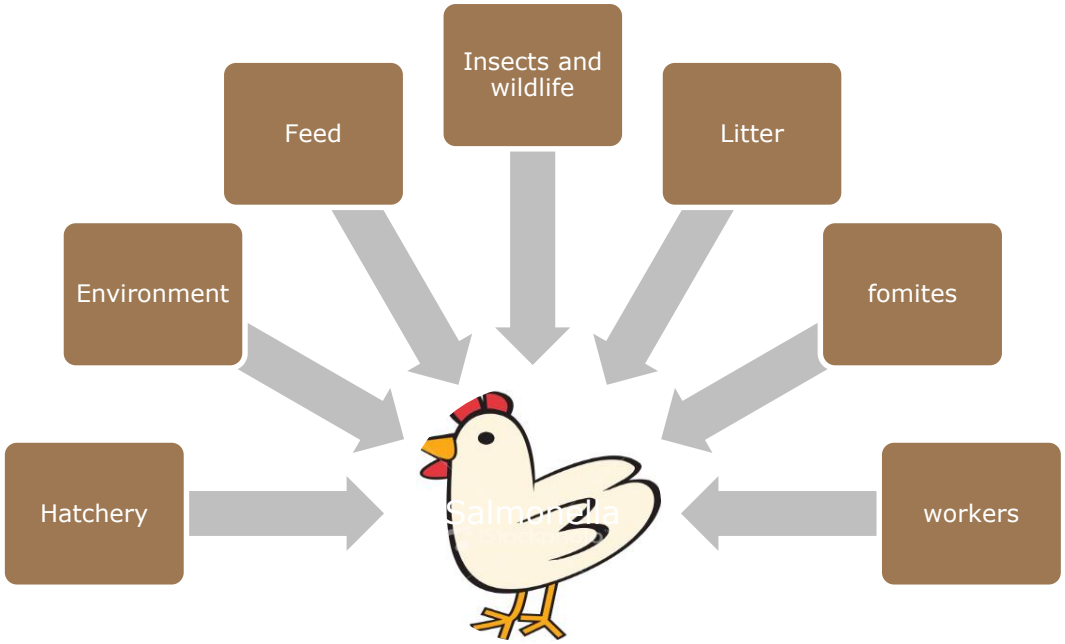
Most Recent Detections



Overall Detections

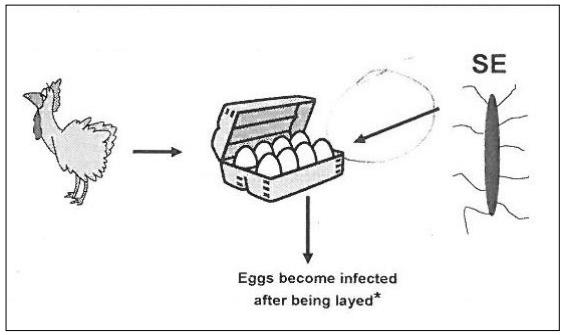


How does the SE get into the bird?

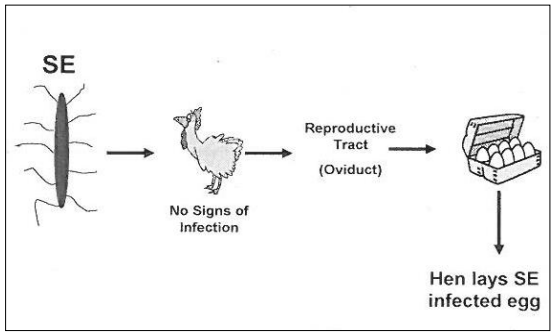


How does the SE get into the egg?

Horizontal Transmission

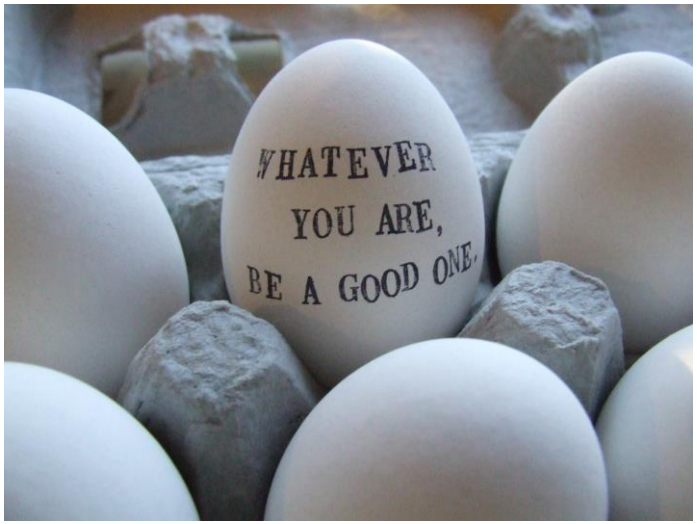


Vertical Transmission



Symptom free SE positive birds exist

A safe egg starts in the coop



Slide adapted from Dr. Dan Famini

The Porous Shell

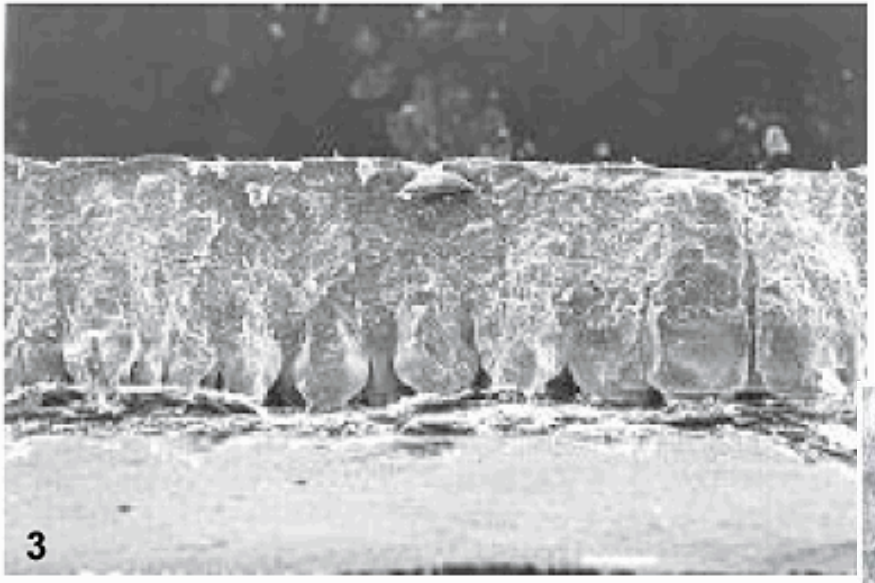


Figure 3 - Lateral view of the eggshell (bar: 100µm).

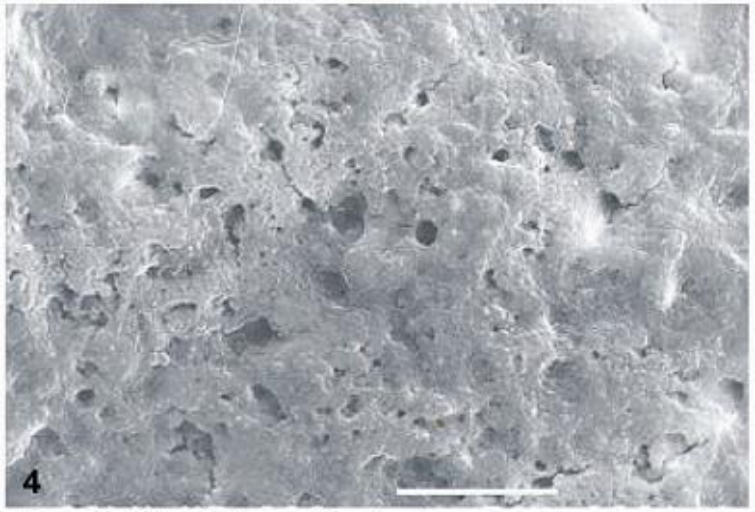


Figure 4 - Outer shell pores (bar: 5µm).

Slide adapted from Dr. Dan Famini

Nest Box Details

Location:

- Higher than the ground
- Lower than roosts
- Tapered top

Slide adapted from Dr. Dan Famini

Nest Box Details

- 1 foot square
- Away from high traffic areas
- 1 box:5 hen maximum ratio
- 2 inches clean, dry bedding

Backyard Egg Collection

Eggs should be sorted immediately after collection

Discard: Fecal contamination, white/yolk contamination, cracks, weak shells

Slide adapted from Dr. Dan Famini

Backyard Egg Collection

Dry brush any feathers, shavings, dry dirt, etc

Eggs with mild dirt, to be cleaned later, stored separately from visually clean eggs

Refrigerate all eggs directly after collection

Disadvantage of sandpaper: wipe of bloom (Bloom = waxy cuticle naturally found on all eggs which has anti-microbial properties for up to 72 hours)

Backyard Egg Cleaning

Wet washing = facilitating bacterial movement across the shell

Specific protocols required to prevent bacterial introduction

Do not immerse eggs in water

Slide adapted from Dr. Dan Famini

Backyard Egg Cleaning

IF you sell eggs you need to wash your eggs:

"free from foreign material and from stains or discolorations that are readily visible"

Cleaning and sanitizing is mandated for any egg sales

For personal consumption no cleaning may be most appropriate guidance

IF proper husbandry

If proper handling

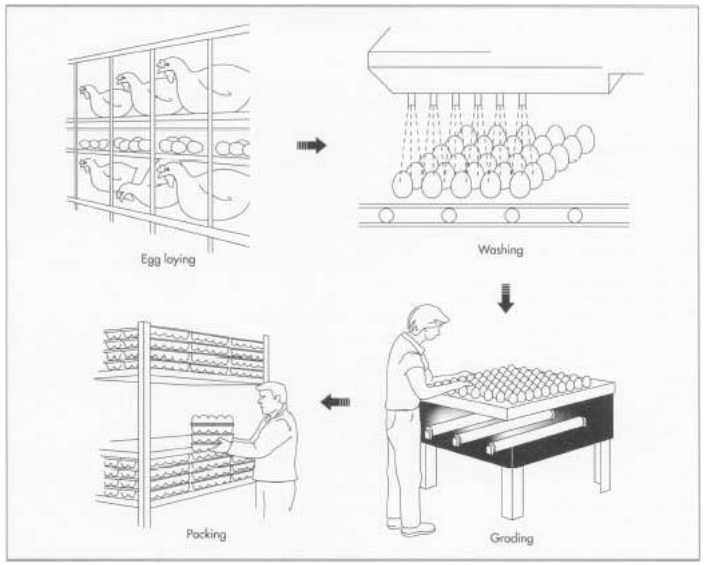
If no evidence of soiling

IF you must clean eggs beyond dry

If you sell table eggs you need to clean them

Typical sequence of egg cleaning

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

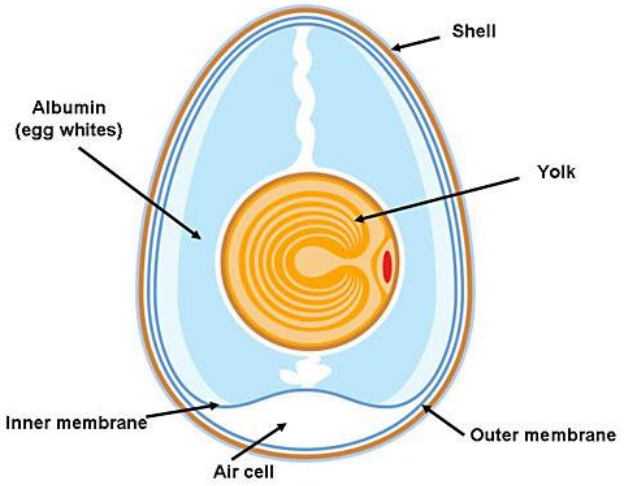


Slide adapted from Dr. Dan Famini

Egg Cleaning - Washing

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

- Wash water temp must be at least 90°F and
- 20°F degrees warmer than the egg (after laying the temp of the egg is ~ 100°F).
- Too big a difference can cause cracks
- In a BY flock, take a "batch" of eggs out of the fridge and warm to room temperature and then wash following the temperature requirement provided above
- However, Salmonella can grow at 100-108°F



Goal of washing:
Removing of fecal material

Washing solutions include:
- Potassium Hydroxide
- Quarternary Ammonium
- Sodium Carbonate
- Sodium Hydroxide

Slide adapted from Dr. Dan Famini

Egg Cleaning - Washing

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

Constantly running water

Water must be potable

Water must not have significant iron

- Low iron in eggs is a defense against bacterial growth
- No more than 2ppm
- Well water or pipe concern

Slide adapted from Dr. Dan Famini

Egg Cleaning – Sanitizing

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

Any chemicals must be Generally Recognized as Safe (GRAS) by FDA

- And approved for food surfaces
- Unscented, dye-free dishwashing detergent a valid consideration for backyard flocks

Slide adapted from Dr. Dan Famini

Egg Cleaning - Sanitizing

1. Washing
2. Rinsing
3. Sanitizing
4. Drying

Dilute chlorine bleach (Sodium hypochlorite) most common agent

Between 50 and 200 ppm

½ tablespoon bleach per gallon water = 100 ppm

Organic materials inactivate chlorine therefore change solution every few hours

Eggs post-sanitizer are not sterile: they have around 100 cells/egg (~ 50%/50% Gram negative to Gram positive bacteria)

Vs.

Pre-sanitizer levels which are ~ 10^5

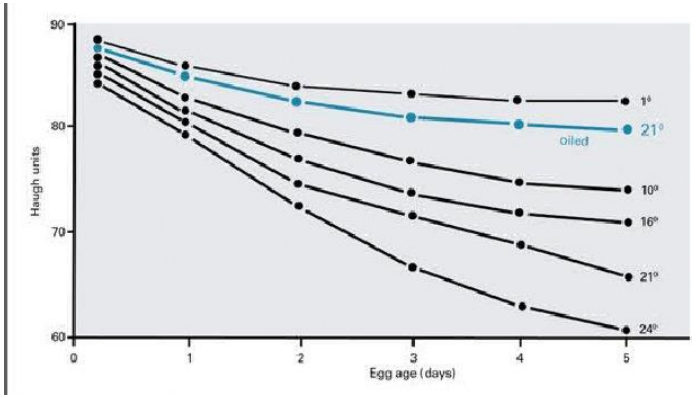
Egg Sanitizing

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

Bloom = waxy cuticle naturally found on all eggs

- Decreases exchange of gas, etc across shell
- Slows loss of quality

Act of cleaning +/- sanitizing removes bloom



Slide adapted from Dr. Dan Famini

Egg Cleaning - Rinsing

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

Same principles still apply

- Safe water
- 20 degrees warmer
- Constantly running water

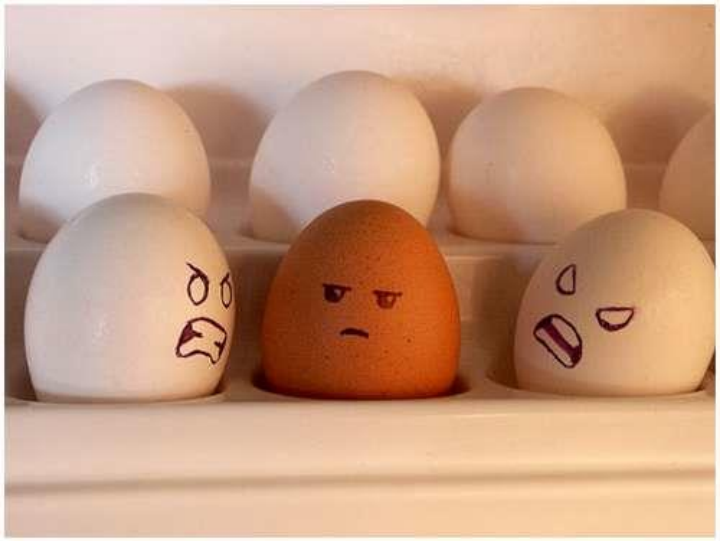
Slide adapted from Dr. Dan Famini

Egg Cleaning – Drying

1. Washing
2. Rinsing
3. Sanitizing
4. Drying

Ensure eggs are dried then returned to refrigerator

- Typical egg cartons or refrigerator storage areas would trap any surface moisture



Slide adapted from Dr. Dan Famini

So how would I do it if I was selling eggs from my BY Flock?

1. Washing
2. Sanitizing
3. Rinsing
4. Drying

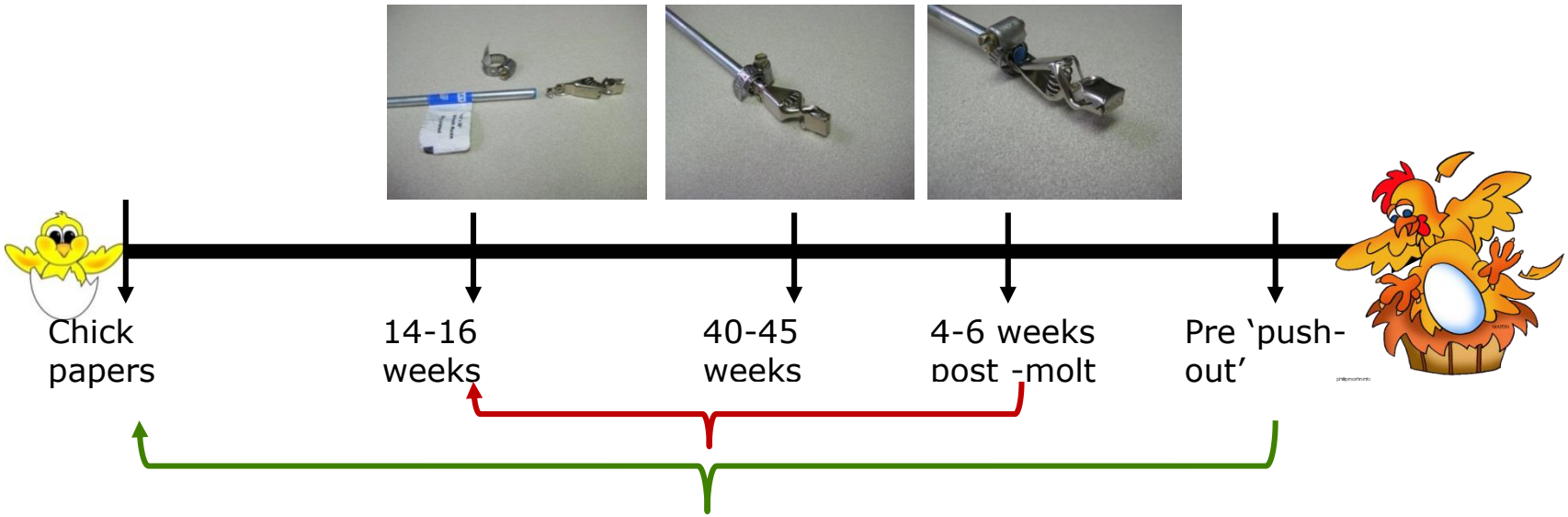
Take eggs out of fridge and temper to room temp for up to 36 hrs

Washing: ½ cap of Clorox in 1.5L of water at ~ 90-95°F. Dip in washcloth and wipe off egg

Rinsing: Wipe with washcloth in water

Dry: Wipe dry and place in fridge

SE Surveillance in the Environment



FDA

Environmental sampling

1) 14-16 week of age; pre-production samples
2) 40-45 week production samples
3) 4-6 week post-molt samples

CEQAP

Environmental sampling

1) Chick papers
2) 14-16 week of age; pre-production samples
3) 40-45 week production samples
4) 4-6 week post-molt samples
5) 2-4 week pre-pushout samples

Questions?

% environmental SE positives by stage of production

	Chick papers	Pre-production	Mid-production	Post-molt	Pre-market	Unknown	Total
SE negative	621	382	370	194	251	560	2378
SE positive	13	8	13	7	34	44	119
Total	634	390	383	201	285	604	2497
% Positive	2.05%	2.05%	3.39%	3.48%	11.92%	7.28%	4.80%

Pearson chi-square tests showed significant differences ($p<0.05$) between the six

Trend showing > SE in environments with older birds consistent with the literature