UCDAVIS VETERINARY MEDICINE

Poultry Ponderings

Edition 19 · Spring 2020

A quarterly newsletter detailing poultry related work, research, and events in California

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Questions or Comments?

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or 530-752-3215

Editor: Odette Clamp

Dear California,

The world has changed since our last quarterly extension newsletters (UC Davis Vet Med Extension Digest, California Dairy Newsletter Poultry Ponderings) were sent out to you last winter. All of our work and personal lives have changed in every way possible and the "new normal" whatever that looks like will be different also...

Our job in Cooperative Extension is to communicate the latest science-based information to stakeholders like farmers, ranchers, youth and the general public on a wide variety of topics including: food safety, animal health and well-being, education and the environment. As part of this mission we give literally hundreds of talks, workshops, seminars etc. every year in multiple venues and formats including scientific conferences, farmer meetings, state and county legislative events, broadcast media, and 4-H and community based events among others. This mission has been severely curtailed by the COVID-19 pandemic. However, our work will continue, and as we recalibrate our efforts, the ideal methods of how to best deliver extension based materials to our audience will change. New methods of communication will evolve, but our core mission to do applied research and communicate results to our California stakeholders will remain the same. To that point Cooperative Extension is making every effort to continue our mission to all Californian's. Please feel free to reach out with questions, requests, comments, deep thoughts, and not so deep thoughts, in the months ahead.

To learn more about the UC Davis School of Veterinary Medicine Extension team please visit our website at:

https://vetext.vetmed.ucdavis.edu/

Stay safe,
UC Davis School of Veterinary Medicine- Extension

UCD Vet Med Extension Team. Left to right: Martin Smith, Gaby Maier, Fernanda Ferreira, Pramod Pandey, Emmanuel Okello, Noelia Silva-del-Rio, Alda Pires, and Maurice Pitesky

New team addition
Rosie Busch

Chickens Don't Get COVID-19

Key points:

- Multiple global studies shows that chickens and other domestic poultry are not susceptible to COVID-19.
- Transmission of coronavirus (of which COVID-19 is one of many types) from poultry to humans or vice versa has not been demonstrated to be an issue.
- Poultry based foods including, eggs and poultry meat are safe to eat.
- Regardless, always handle poultry products and all food with good food safety practices

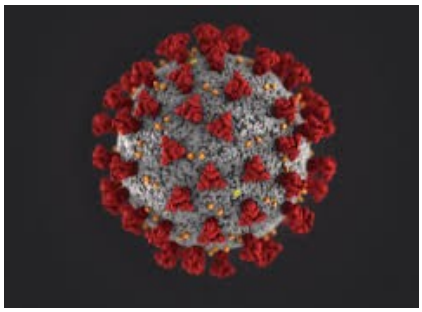

Photo credit: https://www.cdc.gov/

Background on coronaviruses:

Coronaviruses are ubiquitous in animals and they are typically associated with mild respiratory signs. While coronaviruses ae ubiquitous, they typically "stick" to their species. In other words chicken coronaviruses stick to chickens, dog coronaviruses stick to dogs etc. etc. Very rarely do we have transmission of a virus from one species to another. Unfortunately we are dealing with a rare situation now where a virus has "jumped the species barrier" from bats to humans.

The most common poultry version of a coronavirus is a virus called Infectious Bronchitis Virus (IBV). The virus has multiple "versions" that are typically identified with names like Delaware, California variant 99 and Arkansas type. This reflects the slightly different genetics of each strain. Interestingly in the "poultry world" there are different vaccines for different coronaviruses. It will be interesting to see if eventually COVID-19 mutates enough overtime to require multiple vaccine types in humans (assuming that we are able to develop a COVID-19 vaccine…).

Hens from past flock at UCD Pasture Poultry Farm

Big picture with respect to chickens, food safety and COVID-19, remember coronaviruses are respiratory viruses that are transmitted from person to person primarily via the respiratory route. There have been no documented cases of the virus being transmitted via an oral inoculation from a contaminated product (i.e. think of virus being deposited on food by an infected individual).

That being said, the virus has been found in the stool of a small percentage of COVID-19 positive individuals. Hence if someone asked if there is a chance that you could get infected by ingesting the virus, the short answer would be "sure maybe it's possible." However, remember this is biology and in biology there are very rarely absolutes. That being said, based on our historic and emerging knowledge of coronaviruses, the primary route of infection is airborne. Practicing good hygiene, husbandry and biosecurity with your poultry in a COVID-19 world is no different than a non COVID-19 world. When it comes to poultry, let's keep our "eyes on the ball" and focus on the greater risks with respect to food safety such as *Salmonella* and *Campylobacter.*

— Maurice Pitesky

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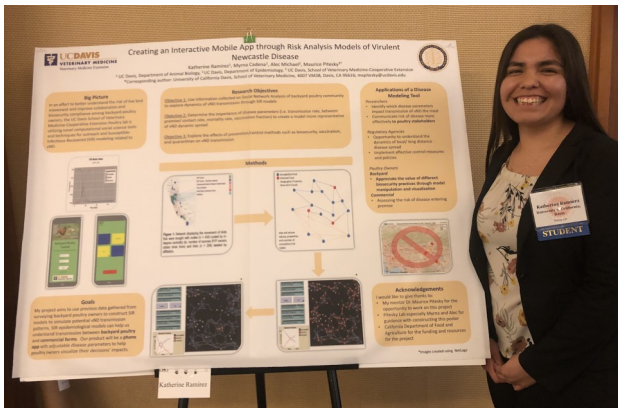
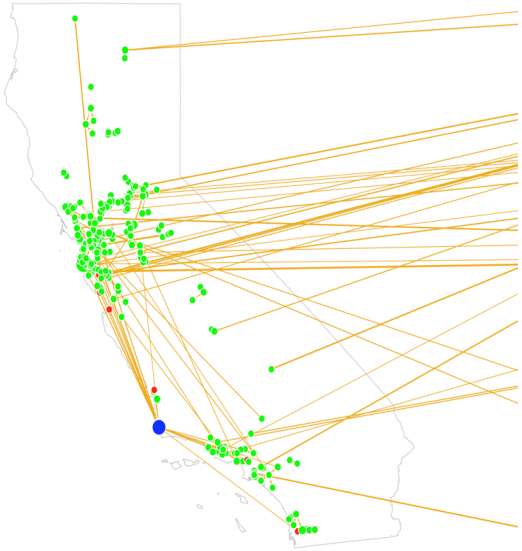
Chicken Disease Modeling and Virtual Conferences

"Disease Modeling" is becoming a ubiquitous term that will be a part of vernacular for years to come. While the term has been mostly associated with the current COVID-19 pandemic, disease modeling is used to track diseases in a range of host species. A current project in the Pitesky lab is tracking the virulent Newcastle Disease in Southern California using novel computational science tools that are being used for outreach and disease modeling of virulent Newcastle Disease (vND). Virulent Newcastle Disease is a serious and contagious viral disease that can affect the nervous, digestive, and respiratory systems in poultry. Southern California has unfortunately witnessed three large outbreaks of vND in the last 50 years. Consequently, researchers are being prompted to better understand the transmission and dynamics that affects how vND is spread among backyard poultry.

Katherine Ramirez, an Animal Biology Undergraduate student, has been working on creating epidemiological models such as Susceptible-Infected-Recovered (SIR) models that help us understand how vND spreads through chickens and the impact certain prevention methods may have on disease spread. With these SIR models, we can create thousands of vND outbreak simulations to examine how different disease parameters affect vND transmission. Disease parameters can include different contact points, mortality rates, vaccination rates and several other factors that can contribute to the spread of infection. As part of her Global Disease Biology practicum in the Pitesky lab, Katherine has been using data on chicken husbandry and movement collected from a survey of backyard poultry owners to develop vND based disease simulations. She was able to present her preliminary findings at the UC Davis Undergraduate Research, Scholarships, and Creative Activities Conference (URC) which was held virtually this year due to the pandemic.



Katherine Ramirez presenting her work on disease modeling at the 2020 Pacific Egg and Poultry Association (PEPA) in Hawaii.



Example of vND simulation. In this simulation, the blue dot refers to the initial disease infected backyard (i.e where our outbreak starts). The red dots refer to nodes that have been infected by the disease due to connections with the blue dot. Green dots refer to nodes without disease but that can still be susceptible to infection. Because only "one cycle" was simulated, we have many more green nodes than red. More sophisticated models are currently being developed. The orange lines refer to the connections one node has to another. Orange lines leading out of California display connections to nodes in other states including Minnesota, Iowa, and Florida.

We hope to incorporate this disease modeling aspect in a poultry app, where poultry owners can see for themselves what can spread or halt vND transmission. Having a hands-on easy to use app will be helpful for the poultry community and serve to educate owners on high risk behaviors and the spread of diseases like vND.

— Katherine Ramirez, Alec Michael, Maurice Pitesky

Research in the Times of COVID-19

These are certainly unprecedented times – most of us are restricted to staying at home as much as we can. I am mostly working at my desk at home, communicating with students and colleagues via video conferencing. As many in society have lost their jobs because of the shut-down of social interactions, others are deemed essential such as health care workers but also grocery store employees, those producing our food, and others who are making sure that our essential goods and services keep being available.

In an effort to comply with social distancing and protecting the student body and everyone related to them, instruction for all students at UC Davis has gone virtual, even for most veterinary students in the clinical rotations. The veterinary teaching hospital is still open for emergencies, but routine and non-emergency cases are not seen for the time being, similar to what is the case in human medicine.

Non-critical research at UC Davis has also come to a stop in order to limit direct human interactions in labs and elsewhere. Some projects are allowed to continue, for example those where discontinuation would lead to catastrophic data loss, and with special precautions in place. In addition, all animals on campus and in research facilities are still being cared for in the same way as before the crisis. We are all trying to continue our work in research and extension as much as possible under the current circumstances, but the formats are changing. In-person workshops and presentations are out of the question at the moment, so providing information via social media, newsletters, webpages, or articles is key at the moment.

Staff continuing their research during the challenges presented by the COVID-19 pandemic.

Two recent outreach articles related to the COVID-19 outbreak include tips on how to stay safe during spring cattle work, which can be found at this link, and explain the difference between coronavirus in livestock and the novel coronavirus in people, which can be found by clicking here.

For beef herd health and production, a trial in stocker steers at Sierra Foothill Research and Extension Center that evaluates the use of ionophores in mineral mix on growth was started in December and will continue until its conclusion in late May. Precautions for study staff include keeping distances of at least 6 feet between personnel as well as wearing personal protective equipment in the form of gloves and masks. The use of electric prods to enforce social distancing, as demonstrated by livestock advisor Josh Davy in the photo taken at the cattle chute at the research center, may be a bit extreme, but all jokes aside, keeping your distance and being mindful of what surfaces to touch, sticking to one task to avoid possible contamination of surfaces and of course handwashing and disinfection of utensils are good ideas that we practice in order to stay safe. We are also keeping the number of personnel involved to a minimum, which means no student volunteers at this time.

We wish everyone to stay healthy and safe during these uncertain times. We are still doing our best to continue our research and outreach efforts without compromising the health of those involved.

— Gaby Maier

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Links from article:

⇒ *https://bit.ly/cattlework_covid-19*

⇒ *https://ucanr.edu/blogs/LNRBlog/*

California Backyard Poultry Census

The UC Davis Veterinary School of Medicine Cooperative Extension has created a brief geo-survey. The information will help researchers better understand how many backyard poultry farms are in California, as well as their locations. Information gathered, including emails, will help open up more opportunities for communication between poultry experts and backyard poultry owners. This could further improve distribution of important information such as new Avian Influenza outbreaks or other relative information. Check it out at the link below:

https://ucanr.edu/sites/poultry/California_Poultry_Census/

New USDA Organic Grant on Poultry and Crops

In the face of food security challenges in different parts of the world, new and improved forms of agriculture can help alleviate many of the issues resulting from escalating stressors such as overpopulation or climate change. A new 4-year USDA Organic Agriculture Research and Extension (OREI) grant will allow the Pitesky lab at the UC Davis School of Veterinary Medicine-Cooperative Extension to test various integrative cropping and poultry approaches. In collaboration with University of Kentucky and Iowa State University a study of rotational poultry systems paired with organic farming will be executed through a 4-year USDA\Organic National Institute for Food and Agriculture (NIFA) grant.

The goals of this newly approved study are to successfully integrate crop and poultry production in order to improve soil quality and fertility, reduce off-farm input, and enhance on-farm diversity. These experiments will be carried out in tandem within three major food producing regions of the country [Midwest, (IA), Southeast (KY) and Western US (CA)]. Different crop and poultry integrated systems will be studied with the goal of optimizing crop and animal production, economics and health.

Over the next four years we will be using certified organic land at UC Davis's very own Russell Ranch, home of the 100-year farming experiment. The 100-year farming experiment is designed to better understand the impacts of agricultural management on resource use, economics, and the environment in the long-term. This will involve three experimental systems: two systems including both broiler chickens and selected vegetable crops, and one control system without the presence of chickens. These different systems will be monitored for a host of crop, soil, and poultry

(continue onto next page)

Meeting to discuss upcoming crop-poultry project. From left to right: Israel Herrera, Nicole Tautges, Brandon Carpenter, Ajay Nair, Maurice Pitesky, Odette Clamp, and Sarai Acosta. Photo credit: Jeffrey Mitchell

New USDA Organic Grant on Poultry and Crops cont.

characteristics that result from their interactions.

While this process has been done in various geographical settings, we hope to improve upon these systems and find innovative ways to enhance the availability of food in negatively impacted areas, including regions where food deserts and food security challenges exist. Additionally, we aim to understand the impacts on soil through integrated systems with the hope of increasing sustainability and profitability for farmers. If you have any questions or comments, feel free to reach out to Sarai Acosta (MS student in the International Aid and Development Graduate Group at UC Davis) and/or Maurice Pitesky at the email addresses below.

— Sarai Acosta, Maurice Pitesky

slnacosta@ucdavis.edu

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Group visiting facility at UC Davis in February 2020. From left to right: Odette Clamp, Sarai Acosta, Maurice Pitesky, Ajay Nair, Nicole Tautges, Israel Herrera, Brandon Carpenter. Photo credit: Jeffrey Mitchell

Dr. Cluck's Trivia

What bird lays the largest egg relative to its body size?

Email **mepitesky@ucdavis.edu** with your answer!

Dr. Cluck's chicken jokes:

- **What do chicken families do on sunny days?**

  They have peck-nics

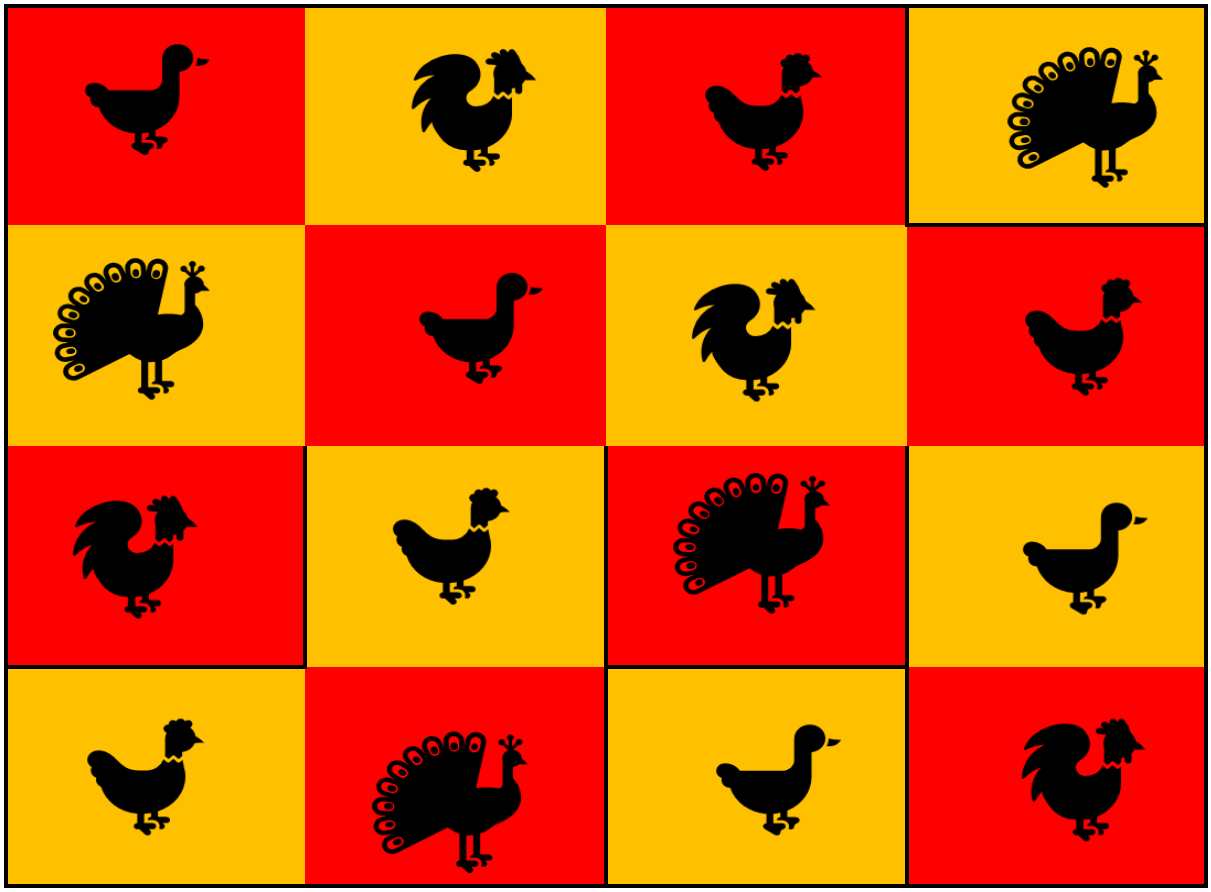
- **What do chickens say in a busy crowd?**

  Egg-scuse me

Last Quarter's Puzzle: Dr. Cluck's Puzzle completed

Important note

We made a mistake on our last puzzle. We provided the incorrect number of puzzle pieces, as seen below. We send our apologies for this mistake.



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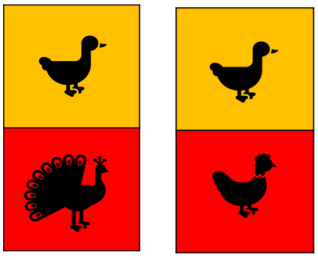
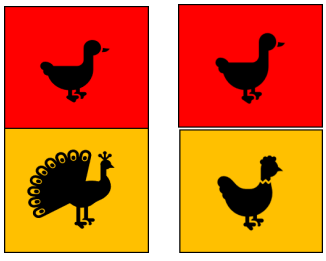


Correct tiles



Find resources on COVID-19 and food safety at our website:

https://ucanr.edu/sites/poultry/

https://ucanr.edu/sites/poultry/COVID-19_/