

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

Inside this issue:

- Chicken-Tomatoes-Cover Crop 1
- Wirecutter: Best Chicken Gear and Accessories 2
- Note From the Editor: Odette Clamp 2
- UC Davis Agrinerds Grant Awarded 3
- Got Chickens and Crops? 3
- Antimicrobial Drug Usage in Boiler Chicken Plumets 4

Chickens-Tomatoes-Cover Crop, Chickens-Tomatoes-Cover Crop, Chickens-Tomatoes-Cover Crop...

By Faye Duan, Jeff Mitchell, and Maurice Pitesky

Integrating poultry into crop production is as old as agriculture itself. The ability to grow multiple crops has provided nutritious food to farmers, their families and their communities for millennium. The earliest farmers learned what crops and livestock were most complementary and productive. Challenges including geography, drought and disease have challenged farmers to produce food sustainably and for a profit. These challenges continue today and hence identifying the best varieties of crops and animals and optimizing their productivity in a sustainable manner epitomizes the ultimate goal of land grant universities like UC Davis.

To that point UC Davis along with Iowa State and University of Kentucky are collaborating on regional studies to quantify the potential for chickens to be part of safe and sustainable commercial organic vegetable production. The USDA-funded study was launched by Iowa State University horticulture professor Ajay Nair. The project also includes UC Cooperative Extension specialists Maurice Pitesky and Jeff Mitchell, based at UC Davis, and University of Kentucky entomology professor David Gonthier. UC Davis International Agricultural Development (IAD) graduate student Faye Duan stated "While these systems are not a new idea, there is currently little scientific information for how best to integrate poultry and crops with respect to production, food safety, soil management and economics. This study is designed to measure multiple outcomes in California, Iowa and Kentucky and provide practical recommendations to interested farmers."

The Nobel Laureate Norman Borlaug considered the "Father of the Green Revolution" was pragmatic in the sense that he focused on finding high yield disease resistant crops. This project attempts to figure out how we can achieve similar advances in agriculture more sustainably by using a rotational system that maximizes the synergies between crops and chickens in the fertile Central Valley of California.



Drone image of the pastured chickens on cover-crop at the Russell Ranch Sustainable Agriculture Facility which is a 300-acre facility that is part of the UC Davis campus. The chicken "tractors" built by students Mallory Phillips and Trevor Krivens house approximately 30 birds each. Each day the tractors are moved to a new plot of land where chickens are able to fertigate the land while supplementing their regular ration of feed with legumes in the cover crop. (Picture taken by Jeff Mitchell, UC-Cooperative Extension).

Questions or Comments?

Contact Maurice Pitesky at:

mepitesky@ucdavis.edu
(530) 752-3215

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

Editors:

Odette Clamp and Christian Avalos

Poultry? We have an app for that!

Backyard Poultry Central is your hub for the latest information on husbandry practices for new and experienced backyard owners. Get notified of outbreaks as soon as they happen, and receive critical information at your fingertips.

Download the "Backyard Poultry Central" app on the Google Play Store



Scan Me!



Need any husbandry gear recommendations? We've got you covered!

Ever felt overwhelmed by all the options for chicken coops, bird feed, or cleaning gear? Don't worry, we've all been there. Luckily, we've got a great resource for you.

Jackie Reeves from Wirecutter recently spoke to two avian experts here from the UC Davis School of Veterinary Medicine, Michelle Hawkins and Maurice Pitesky, to get their opinions on some of the best gear in the market for raising poultry. The article on Wirecutter also features some great tips for chicken first aid, and even some book recommendations for the aspiring farmer in you!

[Click here to read the article](#)

Note from the editor

Hi everyone!

I wanted to reach out and thank you all for taking the time to read our quarterly newsletter. We hope you continue to enjoy its contents and learn more about ongoing and future projects. We've enjoyed providing you with resources for all your poultry Q's! Our team will continue to present you with the most current information, and we look forward to answering any of your future inquiries! Please address questions, comments, new ideas, deep thoughts, and not so deep thoughts to Dr. Maurice Pitesky at mepitesky@ucdavis.edu. Have an eggs-traordinary rest of your summer!

Many thanks,

- Odette Clamp



Community Corner

An Interview with Faye Duan, a student researcher from the Pitesky lab

What made you choose IAD at UCD? What would you say your current career goals are OR what do you hope to gain out of this program?

I wanted to build my expertise in agriculture and UCD is the perfect school for that. I hope I can apply what I learn to my passion for addressing issues of inequality, poverty and sustainability in farming and the larger food system.

Can you please give a brief description of your educational background and/or past projects you have worked on?

Before coming to UC Davis, I worked on a variety of different projects. Some of them are: the promotion of agroforestry in Mali and the West African Sahel, advocacy to improve US government policies that determine how we effectively implement international food aid and agriculture development efforts abroad, and research and planning to support the work of US government natural resource managers.



Can you give a brief description of the OREI project?

The OREI project is a multi-year, tri-state project that aims to study the food safety, agronomic, environmental, and economic impacts of integrating poultry and vegetable production. In California, we are implementing an experiment on a 1-acre plot wherein we produce pastured chickens in the spring, followed by a crop of tomatoes over the summer, then another rotation of pastured chickens after the tomatoes,

Continued on next page ➡

UCD Spin-Off AgriNerds Awarded USDA Small Business Innovation and Research Award

In May of 2021 the USDA announced 24 awards totaling \$2.3 million USD as part of their Small Business Innovation and Research (SBIR) award program. Of the eight awards given to small business's to improve animal production UC Davis spin-off AgriNerds was granted a \$100,000 award for it's research focused on software and hardware solutions for the poultry industry. The software solutions are focused on validating the best machine learning based methods for predicting production and food safety outcomes and the hardware solutions are focused on the development of a novel egg counting device to reduce the error rates that are currently occurring on many layer farms.

The goal of the USDA-SBIR grant program is to "stimulate technological innovation in the private sector and strengthen the role of federal research and development in support of small businesses, " according to USDA-NIFA director Dr. Carrie Castille.

AgriNerds is a UC Davis Spin-off co-founded by several UCD faculty and staff. If you are keen to collaborate on either the software or hardware SBIR funded research please contact Dr. Maurice Pitesky at mepitesky@ucdavis.edu



Got Chickens and Crops?

You are invited to participate in a research survey about integrating vegetable and poultry production through rotating poultry and vegetables on the same land.

The purpose of this study is to understand vegetable growers' experiences and perceptions of integrating poultry into vegetable rotations and their interest in engaging with the research. This study is funded by the United States Department of Agriculture (USDA) Organic Research and Education Initiative.

If you agree to participate, you will be asked to complete a short survey (approximately five minutes). We do not anticipate that you will experience any risks or discomfort from participating.

This survey is anonymous, meaning we will not collect any identifying information, like your name. If you would like to get involved in the research through on-farm trials or joining the advisory board or enter a drawing, we will collect your name via a separate link to keep your name separate from your survey answers.

Anonymous data you provide may be shared with funding agencies, if requested.

Participating in this study is completely voluntary. You may choose not to take part in the study or to stop participating at any time, for any reason, without penalty or negative consequences. You can skip any questions that you do not wish to answer.

If you choose to complete the survey, you will have the opportunity to enter a drawing to win one of four \$25 gift cards.

If you have any questions regarding this survey, please contact Maurice Pitesky by email at mepitesky@ucdavis.edu or phone at 530-219-1407.

[Click here for the survey](#)



If you have any questions about your rights or treatment as a research participant in this study, please contact the University of California Davis, Institutional Review Board at 916 703 9158 or HS-IRBEducation@ucdavis.edu

followed by a cover crop over the winter. Our partners at Iowa State and Kentucky State are implementing similar on-station experiments with locally- appropriate crops and also studying the on-farm impacts of this integrated system.

What initially interested you in working with an organic farming, agriculture related project?

I've worked on many different aspects of agriculture in the past and wanted to get more hands on experience in production and agronomic research. I prefer organic farming because there is less risk of exposure to harmful chemicals. In Asia where I'm originally from, there have been prominent cases of farmers and consumers that suffer the health consequences of exposure to agrochemicals.

What have you enjoyed the most about this project so far or what has been your favorite moment?

I love taking care of living things and watching stuff grow, and being able to eat the product at the end. Even though the work is very hard it beats sitting at a desk and staring at a computer screen all day. I also love the fast-paced, multi disciplinary nature of this project which requires me to collaborate with many great people with different expertise.



What challenges have you faced so far on this project?

Agriculture is a lot of work and also high risk. This is what all farmers have to deal with, and to a lesser extent what we as researchers face as well. There are many things you can't control. It requires lots of planning yet there will always be unexpected challenges that one has to respond to. While I love the multidisciplinary aspect, it also requires an enormous effort to learn how to do all the things that I have no experience with and try not to make too many mistakes as I'm doing it. Luckily I can draw support from so many knowledgeable experts from our lab, the university and the broader project.

Continued on next page →

Antimicrobial Drug Usage in Broiler Chicken Plummets

By Emmanuel Okello

Antimicrobial drug use in livestock is currently a major public concern due to the associated risk of development and spread of drug resistant pathogens to both animal and human populations. To mitigate antibiotic resistance in food animals, the US Food and Drug Administration (FDA) introduced a series of guidelines and regulatory changes between 2012-2017 that increased veterinary oversight on the distribution and use of medically important antimicrobial drugs (important human drugs) in poultry and prohibited the use of such drugs for growth promotion. In California, the state Senate Bill (SB) 27 incorporated and expanded on existing elements of the FDA regulations putting more restrictions on the use of antibiotics in poultry and other livestock species.

Recently, a University of Minnesota led research team conducted a study to estimate the antimicrobial drug use in the US poultry production during the period 2013-2017. The study utilized annual on-farm drug use data that was voluntarily collected from commercial producers, representing more than four-fifths of US broiler production. The findings showed that antimicrobial drugs were mainly used in cases of clostridial diseases (necrotic enteritis and gangrenous dermatitis) and E. coli infections (colibacillosis). Antimicrobials were also used in the hatcheries to control infections transmitted through eggs or the environment. There was a marked decline in the overall usage of antimicrobial drugs in US broiler chicken production during the study period. Major reductions in antimicrobial use were reported for tetracycline (95%) and virginiamycin (60%) which are both important human drugs. Reduced use were also reported for water-soluble penicillin (21%), lincomycin (58%), and sulfonamide (72%). There was a marked decrease in the number of chicks that received hatchery antimicrobials (from 93% to 17%), and the use of gentamicin (commonly used antimicrobial in hatchery) decreased by 75% during the study period.

The decreased use of antimicrobials over the study period could be attributed to the regulatory changes, improved health management practices that reduced need for antimicrobial use, and increased consumers' preference for chicken raised without antibiotics. Improved health management is the most important indicator for good



stewardship that needs emphasis. Although the study focused on commercial broilers, certain scenarios such as the downstream effect of antibiotics used in hatchery and increased veterinary oversight on drugs use applies to small operations as well, e.g. backyard poultry. In California, guidelines on antimicrobial stewardship are provided as online resources by the California Department of Food and Agriculture (CDFA) Antimicrobial Use and Stewardship (AUS) program.

Reference

Singer, R. S. et al. Estimates of on-farm antimicrobial usage in broiler chicken production in the United States, 2013–2017. *Zoonoses Public Health* 67, 22–35 (2020).

Did you know...

Chickens were originally domesticated not for food but for entertainment, religious purposes and as clocks. The roosters crow in the AM signified the beginning of the day for thousands of years!

What are your broader hopes for this project? In what ways do you hope this project will help the community?

I hope that the findings from our project are effectively disseminated to producers to help them introduce or improve their current efforts at integrating poultry and vegetable production. I hope that farmers may find this type of system to be economically and environmentally beneficial and become more resilient as a result of this diverse integration.

As a woman in STEM, what has your experience been like so far in your early career? Any challenges or other notable experiences you would care to discuss?

I think there are systemic challenges in academic institution that make success for women more difficult than for men. I recall that in the 4 years of my undergraduate (at a different State school in the US), I personally did not have a single female professor. This was discouraging. Rather than teaching female scientists that we must have aggressive/dominant "male" qualities to succeed professionally, I think that we should really place higher value on nurturing/cooperative qualities in both men and women that are often seen as more "feminine" qualities.

In terms of diversity, are there any changes or improvements you think could be made in research right now? Are there any disparities and/or improvements that you have noticed in your own past experiences (whether that be in school or while working with research)?

I think there is progress to be made in terms of gender, racial/ethnic and economic inequality. Especially in ag, many researchers come from a privileged economic class and have access to institutions with a wealth of resources. This can lead us to overlook the inequalities in agriculture and the fact that the majority of the world's farmers are smallholders that struggle to make ends meet. We should do a better job of catering research to identify practical solutions to the needs of small scale family farmers and recognize that female farmers may require different solutions than male farmers. We should take interest in crops that minority cultures may prefer to grow. We should also recognize the legacy of white supremacy in the US and how that has left us with structures and institutions that de-legitimize knowledge and ideas from indigenous and non-western cultures.

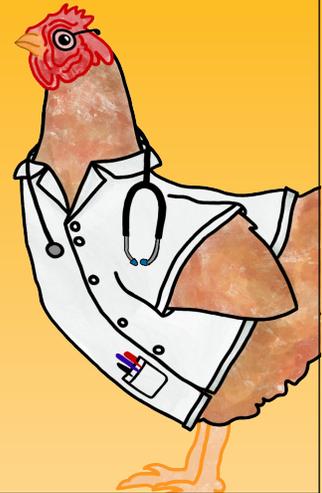
Faye is a current Master's student in the International Agricultural Development (IAD) program at UC Davis.

E	N	S	R	E	T	T	U	C	E	R	I	W	M
I	A	N	E	A	C	C	L	A	I	N	Y	L	E
A	G	R	I	C	U	L	T	U	R	E	S	Y	R
T	A	N	T	I	M	I	C	R	O	B	I	A	L
O	E	L	B	A	T	E	G	E	V	I	O	A	R
C	I	E	H	U	S	B	A	N	D	R	Y	R	E
I	P	A	I	A	L	O	N	M	A	C	L	W	H
V	A	V	E	L	B	A	N	I	A	T	S	U	S
I	T	I	V	I	R	A	R	T	T	R	U	C	E
O	H	A	B	S	O	N	L	B	A	R	L	R	E
O	O	N	H	C	G	T	K	B	O	E	D	C	T
B	G	K	E	O	C	H	I	C	K	E	N	I	T
C	E	G	B	O	S	E	O	T	A	M	O	T	C
I	N	T	A	P	O	I	O	E	I	G	A	I	T

Crack this puzzle!

- Pathogen
- Avian
- Sustainable
- Husbandry
- Antimicrobial
- Chicken
- Wirecutter
- Agriculture
- Tomatoes
- Coop
- Vegetable

Can you solve this word search?



Have you seen our new series, 'The Sitch'?

Sit down with Dr. Maurice Pitesky as he answers the most common questions for new and experienced backyard poultry owners alike. Get insightful and accurate information on the best practices for raising your own birds.

Visit our channel at: <https://www.youtube.com/c/UCDavisVetMedPoultryUniversity>

