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UC Davis Awarded 5 year FDA grant to Study *Anti-microbial Resistance* in Retail Meats

Xunde Li, Rob Atwill and Maurice Pitesky from the UC Davis Western Institute for Food Safety and Security (WIFSS) and the UC Davis School of Veterinary Medicine Cooperative Extension received a 5-year grant to study antimicrobial resistance in retail meats sold in Southern California. Collaborators include the California Department of Food and Agriculture (CDFA) and the California Department of Public Health (CDPH). The objectives of the grant include antimicrobial testing of bacteria from retail meats (retail chicken, ground turkey, ground beef and pork chops) sold in West and East Los Angeles, Irvine and Ontario, California.

In addition to the sampling and testing described above, in collaboration with the CDFA and CDPH a database will be developed to better understand the connectivity between antimicrobial resistance on the farm, the retail level and at the patient level. The long-term goal is to better characterize trends in anti-microbial resistance in retail meats and to better understand the effect of policies implemented to mitigate the incidence of anti-microbial resistant bacteria in retail meats sold in the California and beyond. The grant was awarded by the FDA National Antimicrobial Resistance Monitoring System (NARMS) program. The project will foster and leverage collaborations among federal and state agencies and universities in foodborne disease and antibiotic resistance detection and surveillance in order to improve our understanding of antimicrobial resistance in our food supply and ultimately improve the health of food animals and Californians.

By Xunde Li, Rob Atwill and Maurice Pitesky
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Trivia: What was the first vegetable to be grown in outer space as part of a collaboration between NASA and the University of Wisconsin in 1995?

Moving Forward: Antibiotic Stewardship on Dairies

Over the past decade, antimicrobial resistance has become a world-wide health concern. Statistics from the Centers for Disease Control and Prevention (CDC) indicates that every year in the US, at least 2 million people become infected with antimicrobial-resistant bacteria, and approximately 23,000 people die from these infections. The widespread use of antimicrobials in human and veterinary medicine has been suggested as a contributing factor to this problem. Recent changes in legislation have addressed some of these concerns nationwide, such as prohibition on the use of antibiotics as growth promoters in livestock production, through the update on legislation related to veterinary feed directives. Furthermore, on Jan 1st 2018, the California Senate Bill (SB) 27 will fully come into effect and prohibit the administration of medically important antimicrobial drugs to livestock unless ordered by a licensed veterinarian.

Once SB 27 is implemented dairy producers will not be able to purchase medically important antibiotics over the counter. Moreover, veterinary prescriptions will be required for intramammary drugs that contain medically important antibiotics such as erythromycin and penicillin. SB 27 allows the use of medically important antibiotics as a prophylactic strategy, but only when the veterinarian judges that animals are at high risk of disease or infection, with a few exceptions for drugs which extra-label use is not allowed anytime (e.g. enrofloxacin).

What can we do to improve antibiotic stewardship on dairies?

An important first step is to have efficient methods for accurate identification of animals that need antibiotic treatment, reducing overuse or erroneous use of treatments for a specific disease. In order to start to answer this question our team visited 45 California dairies during fresh cow health evaluations. We observed that the individuals in charge of sick cow identification and treatment were non-supervisor employees (62%), supervisor employees (29%) or dairy owners (7%). Their preferred language was most commonly Spanish (82%) then English (18%).

We observed common methods for diagnosis of fresh cows at different dairies, but it was limited screening for a few select conditions/clinical signs, such as abnormal vaginal discharge (VD), retained fetal membranes (RFM), and down



cows. However, we still observed discrepancies on how these were defined. For example, some dairies limited abnormal VD to vaginal discharge with red-brown color and fetid odor

but others considered that non-fetid vaginal discharge was also abnormal, influencing the frequency of antibiotic use on the farm.

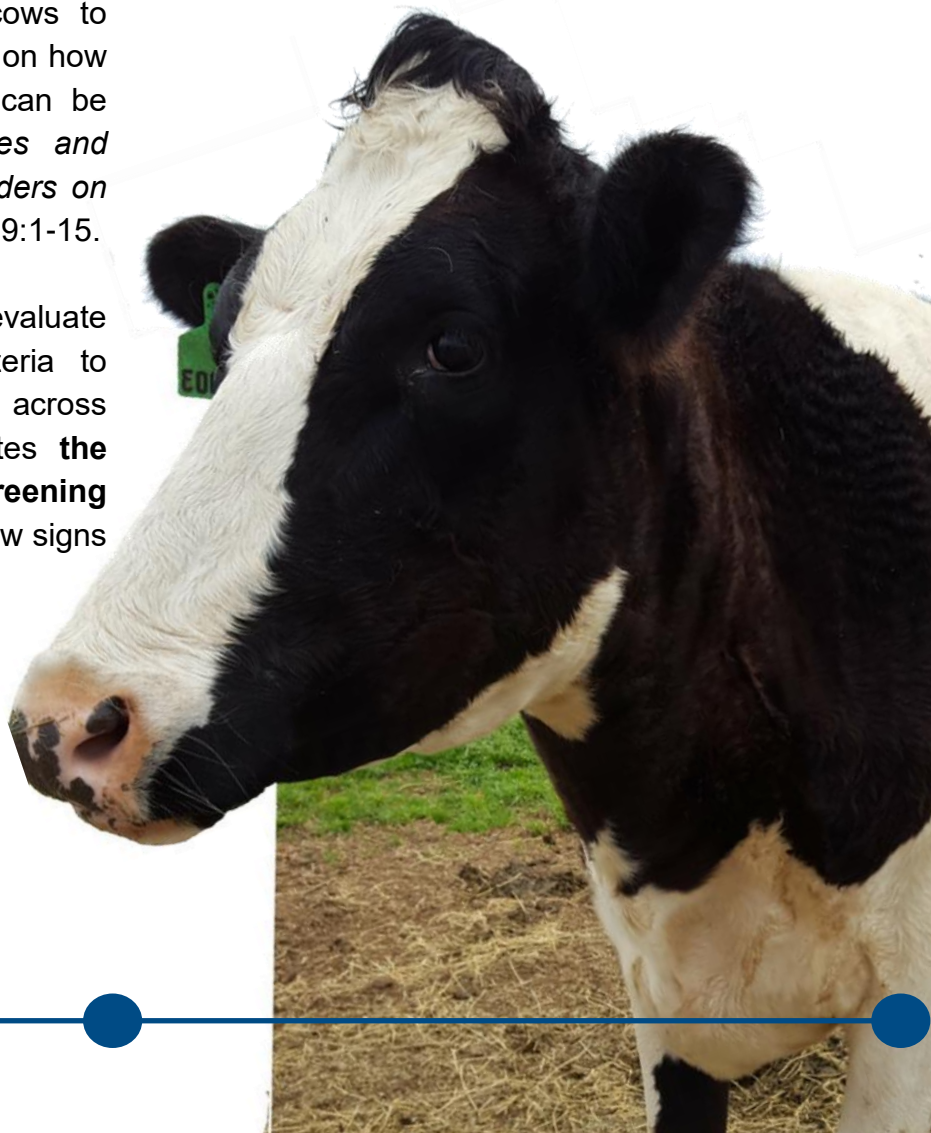
During evaluations, fresh cows were screened for common signs of health disorders including: reduced appetite (62%), reduced milk yield (58%), and depressed attitude (64%). Even though some dairies used the same technique to evaluate signs of a health disorder, the methodology used differed across dairies. For instance, to assess appetite based on feed disturbance in the feedbunk we observed three different approaches: a) the fresh cow evaluator glanced at the feed bunk while standing at the rear end of cows, b) the main evaluator checked cows from behind and relied on his assistant to evaluate the feed bunk of cows suspected to be sick, or c) the main fresh cow evaluator systematically walked in front of the cows to evaluate the feed bunk. More information on how fresh cow evaluations were performed can be found at *"Fresh Cow-handling practices and methods for identification of health disorders on 45 dairy farms in California"* J. Dairy Sci. 99:1-15.

In summary, the techniques used to evaluate signs of health disorder and the criteria to evaluate those were very inconsistent across dairies. This lack of consensus indicates **the need to design standardized screening strategies** that clearly define what and how signs of health disorders should be evaluated. The potential benefits of improved diagnostic methods could lead to better cure rate when antibiotics are use, reduced unnecessary use of drugs, as well as saving in drugs.

As a veterinarian, what can I do?

To design successful fresh cow treatment protocols, veterinarians must understand what is happening at the cow level on their client dairies. Thus, our first recommendation is that veterinarians broaden their client-patient relationship by improving communication with individuals responsible for treatment administration on the farm. Veterinarians should not get discouraged by language barriers; drawings, hand expressions or voice translator devices are useful resources that can enhance communication with Spanish speaking dairy workers.

Based on our data, a great area to being is with **metritis treatment protocols** including disease definition. This is one of the most



important diseases detected during fresh cow evaluations and often times is overtreated, treated in an extra-label, or using antiquated methods that lack scientific evidence of being effective. We noted that the definition of metritis was very flexible across dairies. Most dairies (70%) performed rectal exams prior to systemic antibiotic administration, and treatment decisions were based on: a) Abnormal VD (fetid and non-fetid) regardless



of fever (25%), b) fever regardless of abnormal VD odor (25%), c) fetid VD and fever (2%), d) fetid VD (9%), and d) fetid VD or fever (9%). Some dairies (24%) only detected abnormal VD if visible on tail, vulva or floor; treatment decisions were based on the presence of abnormal VD (20%) or abnormal VD and fever (4%). On 6% of dairies VD characteristics were evaluated after rectal palpation but no systemic treatments were administered. Unspecific signs of health disorder (i.e. depressed

general appearance, lack of appetite or drop in milk yield) were also considered for metritis treatment. Cows exhibiting one unspecific sign of disease plus fever (29%) or regardless of fever (13%) were treated with systemic antibiotics. Overall, fever alone justified systemic antibiotic treatment for metritis on 18% of dairies.

During our field visits, most fresh cow evaluators expressed concern when signs of metritis were detected; they were afraid that the disease may progress into severe stages with implication on cow's survival, well-being, and fertility. Thus, fresh cow evaluators aimed to over-treat cows. However, there is no science-based evidence that early metritis treatment will benefit cows beyond resolving fever or improving VD characteristics.

Training dairy owners, managers and/or treaters on how to evaluate signs indicative of metritis (i.e. AVD, fever, appetite, milk yield) and clearly defining what **combination of signs should result in systemic antibiotic treatment** is a good first step towards antibiotic stewardship on dairies. Furthermore, helping establish standard operational procedures to reduce the risk of post-partum cows developing uterine disease (e.g. proper obstetric practices, reduce ketosis cases), is another good area to focus efforts.

For more information please contact Noelia Silva-del-Río (nsilvadelrio@ucdavis.edu)

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California Farm Academy and UC Davis Co-Host

Pastured Poultry Workshop

UC Davis experts on poultry health, urban agriculture and food safety teamed up with the California Farm Academy to co-host a Pastured Poultry workshop for students from the Center of Land-Based Learning. Attendees were continuing or beginning farmers with diverse interests from quail and bison to hard cider and honey bees. Lecture topics by UC Davis Cooperative Extension specialists Alda Pires and Maurice Pitesky included husbandry and cropping practices, food safety, biosecurity and welfare and behavior.

After the talks, attendees visited the UC Davis Pastured Poultry Farm – a research and innovation farm designed to meet the extension needs of commercial non-conventional free-range and pastured poultry producers. During this field visit, attendees learned about the practical aspects of coop design. Aspects highlighted from the UC Davis coops included foldable perches, moveable coops and automatic doors. Learning about poultry and then discussing how it affects coop design allowed the students to think critically about best practices for their farm with respect to crop production and how it integrates with poultry production.

You can learn more about the UC Davis Pastured Poultry Farm here:

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

[UC_Davis_Pasture_Poultry_and_Innovation_Farm/](http://ucanr.edu/sites/poultry/)



By Myrna Cadena and Maurice Pitesky
UC Davis School of Veterinary Medicine Cooperative Extension

Outdoor-raised *Pig Survey*

Call for Participants

Agriculture Natural Resources (ANR), Cooperative Extension (UCCE) and UC Davis School of Veterinary Medicine are conducting a research study consisting of a voluntary survey designed specifically for owners of outdoor-raised (aka pasture-raised) domestic pigs in California.

Survey Link: <https://survey123.arcgis.com/share/83572138216f426d8377385f4a354617>

Goal: In the last few decades, we have observed an expansion of pasture-based pig operations in America. This trend was driven by consumer demand for sustainably produced, humanely-raised, high-quality local meat products. However, the total numbers of pasture-raised pig operations are unknown. One of the challenges of raising pigs outdoors is the possibility of domestic swine interfacing with wildlife, like feral pigs (aka feral swine, feral hogs, wild pigs, wild boars, etc.). Feral pigs can have an impact on the health and diseases of domestic swine raised outdoors.

This survey is appropriate for anyone that raises at least one domestic pig outside* including: pork producers, farmers, ranchers, backyard operations, 4-H members, pet pig owners, heritage pig breeders, pig rescuers, etc.

(*also referred to as pasture-raised pigs, outdoor-raised pigs, i.e. pig(s) that spend at least 50% or more of their time outside, not confined inside a barn or building)

Your participation will provide critical information for a research project to study the distribution of outdoor-raised (aka pasture-raised) domestic swine.

This survey should take **10-15 minutes** to complete and you'll have a chance to win gifts.

Your answers will help UCCE extension develop outreach and educational materials for all producers that raise pigs outdoors.

All information is kept confidential and only reported as a group (i.e. county level statistics), not on an individual level.

Dr. Alda Pires and her lab staff appreciate your cooperation. If you have any questions or comments, please contact Alda Pires at apires@ucdavis.edu or Laura Paterson at lpatters@ucdavis.edu

Upon completion of the survey, you can provide your email address and be given a chance to win a \$100 Visa gift card. You'll also have an extra chance to win one of two \$200 Visa gift cards if you provide the address where you raise your pig(s) (minimum acceptable address = nearest 2 cross streets).

**The information supplied by you on this questionnaire will be treated as strictly confidential and used for statistical and spatial analysis purposes only.*

By Alda Pires

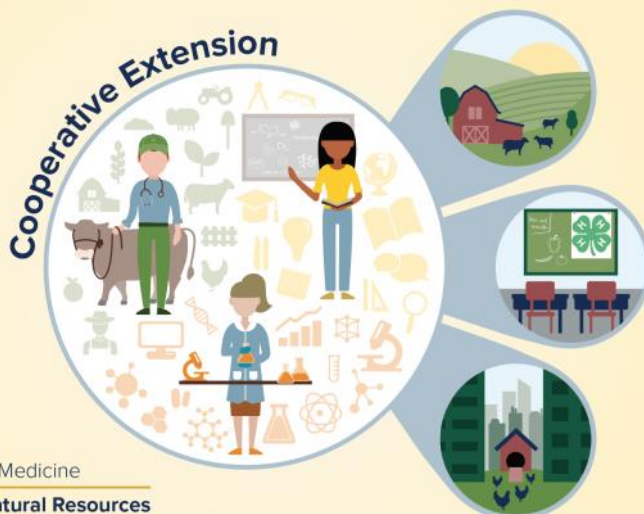
UC Davis School of Veterinary Medicine Cooperative Extension

Alternative Manure Management Training Workshops by Vet Med Extension

University of California Co-operative Extension Specialist, Dr. Pramod Pandey, is organizing three technical workshops focused on reducing greenhouse gases (GHG) emission through implementation of Alternative Manure Management (AMM) practices in California. Dr. Pandey is located in School of Veterinary Medicine Extension, UC Davis. The workshops will be held in Modesto (September, 18), Madera (September, 25), and Tulare (September, 20). These workshops are a part of California Department of Food and Agriculture (CDFA)'s 2017 Alternative Manure Management (AMM) Program, which invites applications for it's multi-million dollar (between \$9-\$16 million USD) grant program. CDFA received \$50 million from the Greenhouse Gas Reduction Fund (GGRF) in 2016, and \$29-\$36 million from the total \$50 million will be used for

supporting dairy digester projects on California dairy operations. CDFA plans to use the remaining money of the total for incentivizing the development of AMM (i.e., non-digester practices to reduce methane emissions in California). The eligible AMM practices for this grant include conversion of a non-pasture livestock operation to pasture-based managed, increasing the amount of time livestock spend at pasture at an existing pasture operation and the construction of a compost bedded pack barn. Further, projects which propose to convert flush to scrap system and install a solid separation system are eligible for this grant program if the project includes manure drying, spreading, and composting.

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www.vetmed.ucdavis.edu/vetext/

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Connection is a publication of the University of California Davis, Veterinary Medicine Cooperative Extension.

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