

Mission Statement

The Animal Health Branch is the State's organized, professional veterinary medical unit that protects livestock populations, consumers, and California's economy from catastrophic animal diseases, disasters that impact animals, and other health or agricultural problems. The Branch addresses diseases and other problems that cannot be successfully controlled on an individual animal or herd basis but require state-wide coordinated resources. Implementing programs that protect California's livestock industries and consumers, ensures the availability, affordability, and wholesomeness of food.



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CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

Animal Health Branch Newsletter

Volume 56

July 2022

State Veterinarian's Message

By: Dr. Annette Jones, DVM, AHFSS Director & State Veterinarian

Summer in California is in full swing, with long, hot days expected. As all of us are painfully aware, California is in another year of drought. However, here are some facts well worth bragging about:

- Between 1980 and 2015, California Agriculture **produced 38% more food with 14% less water**. So, while agriculture is the largest water user in the State, our farmers pull their weight!
- Over 50 years, dairy farmers have **reduced** the amount of water used to produce milk by **88%**!



Both unfortunately and fortunately, farmers are adept "adaptors." I say "unfortunately" because adaptation is challenging. For example, for those using surface water, several districts, including mine in Yolo County, as well as the Central Valley Project, announced zero water allocation for 2022, and the State Water Project announced only a 5% allocation. This translates to hundreds of thousands of acres that will lay fallow this year, and the pressure on ground water will increase. According to a recent UC Merced study, this also translates to \$1.7 billion in economic losses and over fourteen thousand lost jobs.

I also say "fortunately" because adaptation by our farmers keeps water flowing to our towns and cities while remarkably maintaining California as the most productive agricultural state in the nation. To support adaptation, the government is scrambling to make assistance available to farmers suffering drought-related losses. Meaningful assistance can be essential to farm or ranch survival, providing economic support to offset catastrophic losses or investment in drought-adapted practices. That said, some farms will not survive, and others will thrive without assistance. I am sure you have noticed — precision farming is exploding. In fact, California is home to nearly 70% of the nation's drip, trickle, or low-flow irrigated acreage.

We depend on farmers to eat, and we at the Animal Health Branch depend on farmers for our jobs. So this summer, let us all think about how we can help. How can the Animal Health Branch adapt to offer the most support possible to the agricultural producers we serve? What should our future service look like? Truly critical food (and water!) for thought.

Equine Infectious Anemia in California

By: Emily Nietrzeba, DVM, MPH, Equine Section Lead

California has seen an unusually high number of positive cases of Equine Infectious Anemia (EIA) in 2022. Thirty-five (35) cases of EIA have been confirmed in California on five (5) premises since the start of 2022, with twenty-seven (27) of those being epidemiologically linked (i.e., associated with each other) and limited to a subset of the racing horse population.

EIA is a viral disease that affects only members of the Equidae family, including horses, donkeys, mules, and zebras. Clinical signs can range from an asymptomatic carrier state to fever, inappetence, severe anemia, and sudden death. Viral transmission is via bloodborne route, naturally through insect vectors such as horse flies and deer flies, or iatrogenically (artificially by human intervention) via contaminated blood products or other intravenous (IV) substance administration, or via contaminated IV equipment such as hypodermic needles and/or syringes. In all recently confirmed cases in California, epidemiological investigations indicated viral transmission was highly likely to be iatrogenic.



EIA is a reportable condition in all states. Testing for EIA can only be conducted at a federally approved laboratory, and both enzyme linked immunosorbent assay (ELISA) or agar gel immunodiffusion assay (AGID) are approved testing methods. However, AGID remains the gold standard and also the confirmatory test for EIA in the event of an ELISA positive, as there is a very low incidence of false positive ELISA tests for EIA. There is no vaccination or treatment currently available for EIA, and infection is lifelong. As such, positive animals must be euthanized or quarantined 200 yards away from all other equids for the remainder of their life.

While vector control management aimed to reduce equid exposure to biting flies is highly important in disease prevention, bilingual education and outreach to emphasize the severe and potentially fatal risk of reusing IV equipment and/or unlicensed blood or IV products is critical to preventing iatrogenic spread of EIA in horse populations. Needles, syringes, and IV administration sets should never be reused, and only sterile, new needles should be used when administering appropriately labeled injectable medications and approved blood products. Blood transfusions should be performed only by licensed veterinarians using donor blood that has been screened negative for EIA and other blood-borne pathogens such as equine piroplasmiasis (EP).

Ongoing outreach and education regarding prevention and continuing to foster active communication and strong working relationships between veterinarians, clients of all disciplines, and animal health officials remain priorities and challenges for the control and future eradication of this challenging equid viral disease.

Additional information about EIA and viral transmission and prevention can be found on the [CDFA EIA website](#), as well as on the [USDA EIA website](#).

CAHEN's Summertime Scoop in the Coop!

By: Laura Bradley, DVM, CAHEN Veterinarian



We are spreading our wings here at the California Avian Health Education Network (CAHEN). On June 1st, we celebrated our second-year anniversary (cotton is nice but “likes” are good too). We've kept a close eye on the 2022 Highly Pathogenic Avian Influenza (HPAI), also called Bird Flu, outbreak affecting the birds in our nation. From the time HPAI was first detected in a wild duck in January, it has been detected across 36 states, 186 commercial flocks, and 184 backyard flocks totaling 40.09 million affected birds!

After the first HPAI detection in the US this year, CAHEN teamed up with our other CDFA programs to get the information out to the public through our social media platforms discussing how to protect California flocks with stringent biosecurity measures, infographics explaining California permitting requirements for birds (and bird products) originating from HPAI Control Areas, and poultry industry preparedness. Currently, we are collaborating with California zoos to inform the public on what they can do to protect zoo animal residents while visiting zoos during Bird Flu season. Our veterinarians also monitor California's Secure Food Supply (SFS) permitting desk for poultry and poultry product movements into California to protect resident flocks.

CAHEN continues to perform poultry and egg related inspections, attend routine visits to over 350 feed and pet stores throughout southern California to help them learn about safeguarding their birds and customers against avian diseases, and closely monitor interstate poultry crossings entering California to prevent the introduction of foreign animal diseases such as avian influenza. CAHEN has participated in 26 outreach and education events including auctions, swap meets, fairs, shows, schools, town hall meetings, FFA and 4H Club meetings, and other agricultural events. Through these events, we have shared over 1000 egg-cellent conversations with our Southern California community members. Additionally, our team of veterinarians have a great working relationship with several veterinary clinics and animal shelters where we provide educational materials, resources, and coming soon, in-person presentations! We hope to see you at one of our upcoming events such as the Chino Junior Livestock Fair and the California State Fair taking place in July, the Orange County Fair in August, and the Norco Fair in September.



Dr. Bradley speaking to students at an outreach event.

Have any pictures or fun stories about your fabulously feathered friends that you would like to share with us? Follow us on Facebook at California Avian Health Education Network and Instagram @cahensocal. We would love the opportunity to admire your birds! Be on the lookout for any upcoming outreach events and any new programs we will be offering to our Southern California communities. #hellosummer

Tulare County EIA Cases: Investigation Summary

By: Kaylee Lashnits, DVM, Tulare District Veterinarian

On April 28, 2022, the Animal Health Branch's Tulare District received a report that a racing horse in Riverside County had tested positive for Equine Infectious Anemia (EIA) at the California Animal Health and Food Safety Laboratory (CAHFS), with confirmatory results from the National Veterinary Services Laboratory (NVSL) still pending. The trainer of the positive case reported that the horse had resided in Riverside County for about the 2 to 3 weeks prior to testing, but had originated from a premises in Tulare County. On May 3, the Riverside County EIA result was confirmed positive at NVSL, and an investigation into the Tulare County trace premises was initiated.

On the afternoon of May 3, Tulare staff conducted an initial site visit at the premises in Tulare County and issued a quarantine for all 36 potentially exposed horses on the premises, the majority of which were racehorses. The layout of the facility was mapped and photos of each horse on the property were taken. On May 4, blood samples for EIA testing were collected from 35 horses on the property for submission to both CAHFS and NVSL. One horse could not be safely caught for testing and was scheduled for testing at a later date. Given the risk factors for EIA viral blood borne transmission are similar to those of equine piroplasmiasis (EP), samples were also submitted for EP testing at NVSL as well. Tulare staff investigated potential routes of transmission through discussion with the property owner as well as horse owners boarding at the premises, and worked to verify timelines for movement of horses onto and off of the property. Staff also provided interactive outreach and education to the horse owners regarding prevention of future EIA infection. Reuse of hypodermic needles and fluid administration sets were determined to be the most likely cause of EIA viral transmission.



On May 16, results from NVSL unfortunately confirmed 24 out of the 35 horses tested were positive for EIA, though all were negative for EP. On May 17, results were relayed to the property owners. EIA Acknowledgement forms for all positive horses were signed. The remaining untested horse on the premises was sampled the same day, and NVSL results were confirmed negative for both EIA and EP.

On May 24, all 24 EIA positive horses were humanely euthanized by a local veterinarian. Seventeen carcasses were removed from the premises on May 24, and the remaining seven were removed on the morning of May 25. The quarantine was amended such so as to remain in effect for all equids on the premises and require further testing for EIA in 60 days. The retest date is scheduled for July 25.

An adjacent premises housing seven horses was located within 200 yards of the affected horses on the Tulare EIA positive premises. Due to the close proximity which is within, these horses were also tested for possible exposure to EIA on June 3 and a separate quarantine with EIA testing requirements was placed on this premises. All seven horses were confirmed negative for EIA and EP at CAHFS and NVSL. The retest date for all horses on this second premises is also scheduled for July 25.

Epidemiological investigations into any additional potential exposure or links to these EIA cases within their associated racing community are ongoing.

Rendering Disruption Hotline

By: Lisa Quiroz, Program Manager III, Emergency Preparedness and Response Section

A rendering disruption can result in a livestock or poultry carcass disposal emergency when rendering services are not available to livestock producers due to diminished rendering capacity. Such diminished capacity can occur during scheduled maintenance or breakdowns, as well as during increased demand for rendering during large animal mortality events, caused by extreme weather, isolated incidents, or routine animal disease/feed contamination events. Historically, California has experienced the most severe impacts of rendering disruptions during the high heat summer months in the dairy-dense Central Valley. During a rendering disruption, a quarantine notice is issued by the State Veterinarian, serving as an exemption of the Food and Agricultural Code to permit alternative livestock carcass disposal during the emergency period.



When the California Department of Food and Agriculture (CDFA) receives notification of an actual or scheduled rendering disruption, the Animal Health Branch (AHB) works with the Meat, Poultry, and Egg Safety Branch (MPES) to distribute the quarantine notice and an emergency animal mortality advisory which provides producers with county-specific livestock carcass disposal guidance. MPES has established a Rendering Disruption Hotline for these notifications. Renderers can call the hotline or otherwise notify MPES when they anticipate or experience breakdowns that will cause a disruption in services. Producers can call the hotline to report rendering service disruptions or when they need assistance with emergency disposal alternatives during an actual rendering disruption. Producers may also reach out to the appropriate AHB District Office with any questions.

Rendering Disruption Hotline: 916-900-5261

Foreign Animal Disease Investigations For Reporting Period March 16 - June 15, 2022

By: Alireza Javidmehr, DVM, MPVM, PhD, Emergency Preparedness and Response Section

California invests considerable resources to protect the livestock industry against Foreign Animal Disease (FAD) outbreaks. FADs are serious animal diseases that have either been eradicated from or have never occurred in the United States. A widespread FAD outbreak can disrupt the food supply chain and threaten the nation's food security. In addition, some FADs can be zoonotic, posing a public health risk. FADs are real threats to our nation and can not be handled effectively on an individual basis, but instead are addressed by regulatory veterinarians, epidemiologists, and public health officials.

To protect California's livestock industry, FAD diagnosticians investigated 161 FAD suspicious cases (Table 1) between March 16 and June 15, 2022. Nearly 95% of these investigations were to rule out Foot and Mouth Disease (FMD) in pigs shipped to slaughterhouses in California. In all of these cases, lesions were caused by Senecavirus A (SVA). SVA infection is an endemic disease in the US; however, it triggers an FAD investigation due to the similarity of lesions to FMD. Any animal diseases presenting similar signs to FADs must be treated as such until an FAD can be ruled out.

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All Emergency conditions listed in the [California reportable animal disease list](#) must be reported to the local animal health authorities within 24 hours. The AHB district offices' contact information is listed on the last page of this newsletter, as well as on the reportable disease list.

Table 1. Summary of FAD investigations from March 16 to June 15, 2022

AHB Districts	Disease	Species	Sample Type	Number of Investigations	Destination Lab**	NVSL Result
Modesto	Foot and Mouth Disease (FMD), Senecavirus A (SVA)	Porcine	Swab	138	CAHFS-Davis	All positive for SVA
	Rabbit Hemorrhagic Disease (RHDV2)	Rabbit	Carcass	1	NVSL, CAHFS-Davis	Positive
	Vesicular Stomatitis Virus (VSV)	Equine	Swab, Serum	2	NVSL, CAHFS-Davis	Negative
Ontario	VSV	Equine	Swab, Serum	1	NVSL, CAHFS-Davis	Negative
Redding	African Swine Fever (ASF), Classical Swine Fever (CSF)	Porcine	Swab	1	NVSL, CAHFS-Davis	Negative
	VSV	Equine	Swab, Serum, Tissue	2	NVSL, CAHFS-Davis	Negative
Tulare	FMD, SVA	Porcine	Swab	14	NVSL, CAHFS-Davis	All positive for SVA
	VSV	Equine	Swab, Serum	1	NVSL, CAHFS-Davis	Negative

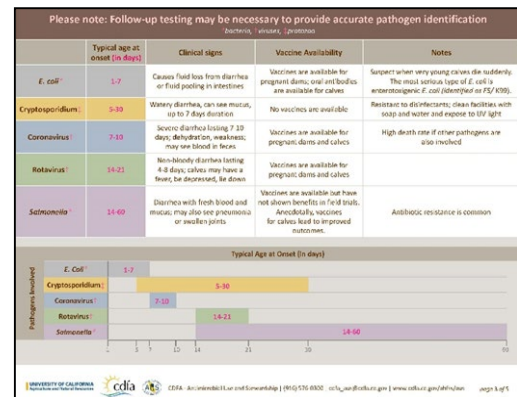
*NVSL: National Veterinary Services Laboratory
CAHFS: California Animal Health and Food Safety Laboratory

AUS Releases New Cow Calf Disease Management Resources

By: Antimicrobial Use & Stewardship Branch

The California Department of Food and Agriculture (CDFA) Antimicrobial Use and Stewardship (AUS) program and Dr. Gaby Maier, Beef Extension Specialist at University of California, Davis Cooperative Extension, have published resources addressing the top three diseases leading to antimicrobial use in California, as determined by the CDFA AUS 2017 [cow calf survey of California livestock producers](#).

The **Cow Calf Disease Management Resources** are designed to help producers and veterinarians optimally target [infectious bovine keratitis \(IBK, pink eye\)](#), [scours](#), and [bovine respiratory disease \(BRD\)](#), conditions that lead to antimicrobial use in cows and calves. These resources can be shared with livestock producers as condensed field guides with helpful tips and reference photos. Spanish versions of the producer resources will be published on our website in July. In-depth, research-based summaries on each of the three diseases are coming soon, which contain additional background and citations for further reference.



Resource page of Cow Calf Scours: Strategies for Management

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CDFA AUS hopes that, in providing practical guides to cattle producers and their veterinarians, they may identify areas to optimize their overall antimicrobial use through preventive practices, accurate diagnostics, and the most targeted therapies.

To view this series and keep up with the updates on these resources, please visit: www.cdfa.ca.gov/ahfss/aus/

CDFA AUS Releases Veterinary Feed Directive Report

By: Antimicrobial Use & Stewardship Branch

The California Department of Food and Agriculture (CDFA) announces that its [Antimicrobial Use and Stewardship](#) (AUS) program has released the 2020-2021 Veterinary Feed Directive Summary Report.

The report is broken into four main sections: Executive Summary; Veterinary Feed Directive (VFD) Data Tables; Data on 2020–2021 Manufacturing and Distribution; and a Conclusion that discusses CDFA's future steps in working toward reducing antimicrobial resistance in animal agriculture. Each report section has been streamlined for comprehension with the goal of providing complete transparency into VFDs and how they play a part in maintaining and promoting a high standard of public health.

Report features include:

- Links to both previously released VFD Summary Reports
- Two years of aggregated data; 2020 and 2021
- Streamlined information highlighting the VFD Data Tables
- Updated AUS goals for education, outreach and VFD compliance

[Click here](#) to view the 2020-2021 VFD Summary Report.



Help Identify Veterinary Shortage Areas for Federal Designation

By: Antimicrobial Use & Stewardship Branch

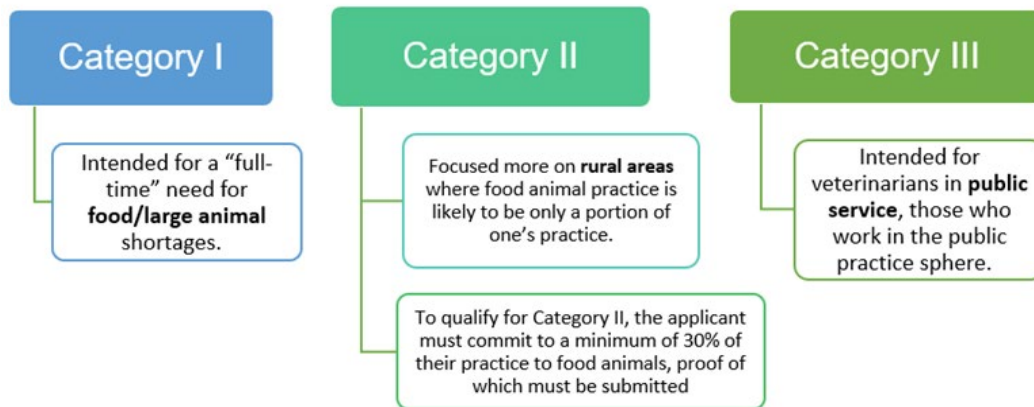
Veterinarians and producers can help guide CDFA's efforts to nominate veterinary shortage areas for [USDA NIFA's Veterinary Medicine Loan Repayment Program \(VMLRP\)](#). Shortage nominations provide two opportunities to support qualified veterinarians and their practices. Through VMLRP, a significant portion of the educational debt incurred in pursuit of their veterinary medicine degrees can be offset in return for attracting or retaining their services in [designated veterinary shortage areas](#) for a minimum of three years. Veterinary shortage areas identified are also eligible for funding to establish or expand veterinary practices in rural areas through USDA NIFA's Veterinary Services Grant Program's (VSGP's) [Rural Practice Enhancement grants](#), which can be used for activities such as developing mobile veterinary facilities to address education or extension needs in the area.

CDFA is currently seeking input on regions experiencing a veterinary shortage for consideration in the 2023 nomination cycle.

Once an area has been officially designated, veterinarians can then apply for funding in spring 2023 if they

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work or intend to work in a designated shortage area and meet the requirements for the area's position as designated by one of the three categories, described in the image below.



CDFA AUS requests that nomination suggestions be emailed to cdfa_aus@cdfa.ca.gov, or be submitted as a [survey entry](#), by September 30, 2022 for consideration as a potential nomination.

Case Report: Pseudorabies Infection in Domestic Dogs

By: Dr. Randy Anderson, DVM, Modesto District Veterinarian-in-Charge

The Modesto district office received a call from a small animal practitioner that had a suspected case of Pseudorabies (PRV, also historically known as "mad itch") in two adult dogs. Both dogs were exhibiting neurologic signs, including extreme pruritus (itchiness), eye twitching, facial tremors, teeth chattering, and fever. A thorough history revealed that the dogs started showing clinical signs after returning to California after participating in a wild (feral) pig hunting competition in Texas. The owner also reported that other dog owners stated that at least two dogs (possibly up to seven) that competed in the event were euthanized after showing similar signs. Reportedly, all affected dogs were given raw organs and tissue from the harvested pigs, a practice often followed to reward the dogs for a successful hunt. Both of the aforementioned dogs were euthanized by the private practitioner and were taken to the California Health and Food Safety Services (CAHFS) laboratory in Davis for necropsy by a CDFA Animal Health Branch veterinarian. No significant gross findings were observed, but histologically, non-suppurative encephalitis and ganglioneuritis was seen. The brain, tonsils, and myenteric ganglia were positive for PRV by immuno-histochemistry (ICH). Results were confirmed at the National Veterinary Service Laboratory (NVSL) in Ames, IA, and PRV virus was isolated from brain and CNS tissue.

This is a poignant reminder that PRV is still present within the feral pig population throughout the United States, and can be readily transmitted to domestic animals through nose-to-nose contact, and to other species through ingestion of raw organs or meat from infected pigs. Pseudorabies can infect several animal species, both domestic and wild, though does not affect humans. This case is also an excellent illustration of the critical importance of private practitioners in prompt and accurate detection of reportable diseases, and as critical first responders to incidents of such disease.

Is Fire Season in California Year-Round?

By: Sonia Brown, Program Manager II, CARES Unit

The “wildfire season” in California has been historically considered to begin in May and end in October, with September and October considered the most vulnerable months for wildfires. According to [CAL FIRE](#), of the 20 most destructive wildfires in California history, 11 of them took place in September and October, and these fires took place as far apart as Napa Valley and San Diego. However, with climate change as a contributing factor, fire season begins earlier and ends later each year, with some experts suggesting that the fire season in California is now year-round.

For the last decade, year after year, California seems to endure the worst extent of fire season right into the arrival of the following “expected” season. Why? According to the [California Drought Monitor](#), 93 percent of California is in *severe* or *extreme* drought. When that is coupled with last winter’s snowpack measuring only 63 percent of the average on March 1, 2022 per the [California Department of Water Resources](#) (DWR), it creates conditions for disaster. The CAL FIRE and U.S. Forest Services combined number of fires for 2022 as of May, have already reached 3,311, with 21,343 acres burned, according to [CAL FIRE’s website](#).



The California Animal Response Emergency System (CARES) is in continuous planning and preparedness mode, developing multiple plans, procedures, and job aids for staff who will be utilized, not if but **when**, CARES is deployed to support a state or local government emergency operations center. Additionally, CARES has also created several tools for local government to assist them in preparing and responding to a natural disaster, more often than not, fires. In essence, “all disasters are local” until they reach the state level, which triggers response not only by the CDFA California Emergency Support Function (CA-ESF) 11 but also the CARES program.

Similar to firefighters that no longer have the luxury of putting their gear away when the fire season ends, CARES must now plan and prepare for wildfire occurrence at any time of the year, not just during an anticipated period of time, because fire season in California is now all year-round.

AHB Staff Biographies

Patrick Biddle was born and raised in the San Francisco Bay Area, where he earned his bachelor's degree in Geography at San Francisco State University. For over 10 years, Patrick has worked primarily in customer service, as a women's shoe salesman, barista, and as an associate at American Water Works Association. Patrick began work for Animal Health Branch in September 2021 and has enjoyed learning the nature of the industry. Patrick recently accepted a position with the AHB Emergency Preparedness and Response Section. He enjoys reading, watching television, and hopes to one day be able to afford Las Vegas Raiders season tickets.



Lauren Schwertfeger grew up in east Los Angeles in an area that had many ranch properties. Admiring the ranches at a young age, she knew she wanted to work with animals. She transferred from a junior college in Southern California and graduated from UC Davis with a bachelor's degree in animal science.

Shortly after moving up to Davis, Lauren began volunteering at Sacramento Zoo where her passion of caring for animals grew. She soon favored hoof stock and became an Ungulate Intern where she had the privilege to work closely with zookeepers and veterinarians while assisting with giraffe training and medical treatments. After her internship, she began working as a farmhand on a private estate in Sonoma. There she cared for a variety of animals including Southdown Baby doll sheep, Nigerian Dwarf goats, and Kunekune pigs. Lauren was quickly promoted to management where she began HR duties, recording keeping, registry work, and annual disease testing of their herds while continuing to directly care for the animals. Her appreciation of the importance of herd health management and her new understanding of good communication and record keeping drew Lauren toward pursuing a career here with the Animal Health Branch. Lauren joined the AHB Animal Disease Traceability Unit, working on the Movement Permit Desk in March, 2022.

In her free time, Lauren enjoys crafting, studying botany, hiking, camping, and visiting state and national parks.

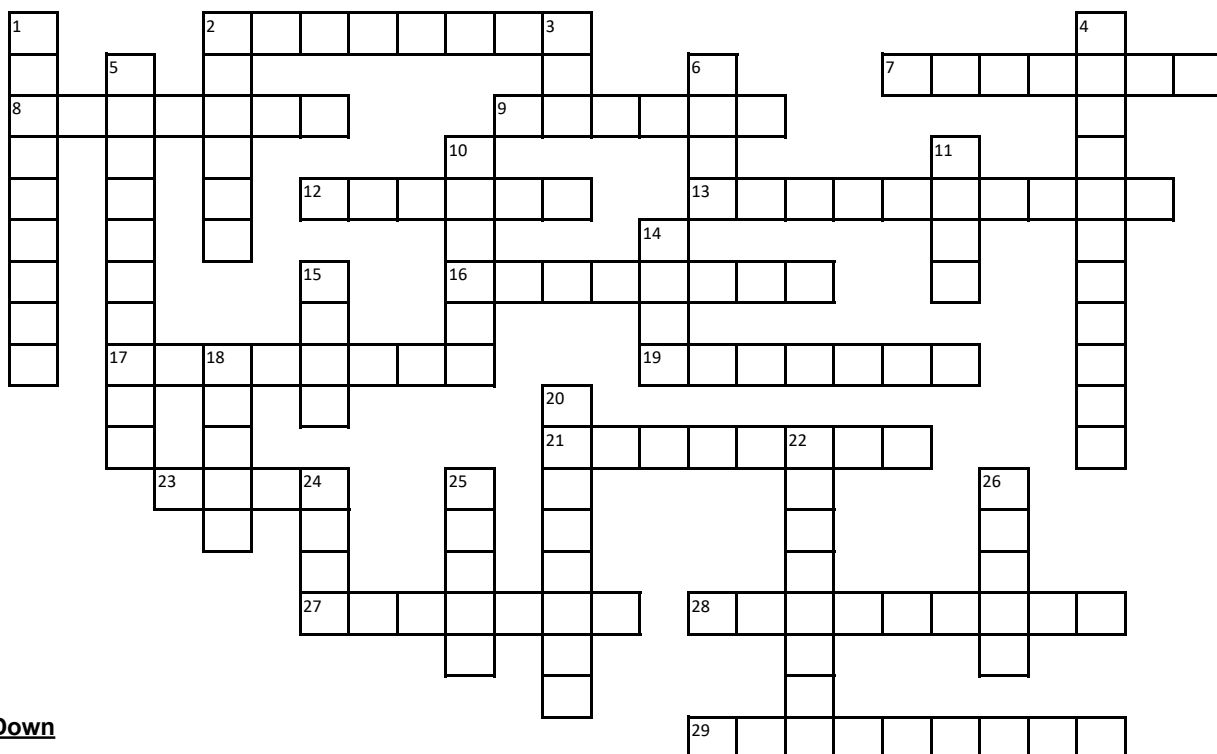
Hi from **Dr. Natalie Ward**! Dr. Ward graduated from Washington State College of Veterinary Medicine in 2010. After graduation, she went to work in Dunsandel, New Zealand for the first 6 months of her career. There, Dr. Ward worked in the seasonal dairy industry's calving season until she accepted a job as a full-time dairy vet in Visalia with Mill Creek Vet Services, where she worked for seven years. After that, Dr. Ward took a position working as the staff veterinarian for one of her clients until she decided to make the switch to state work. Dr. Ward is joining the Animal Health Branch in the Tulare District.

While at Mill Creek, Dr. Ward met and married her husband, also a dairy vet, and they have two teenagers at home. Their daughter just graduated high school and their son will be a junior. They enjoy travelling, scuba diving, and spending time with all of their extended family in the area. In Dr. Ward's spare time, she cares for her pet cow, Lulubelle, and her assorted progeny, garden, and attempts to train her dogs (no luck yet).



Crossword Puzzle: Biosecurity Terms

By: Mandy Johnson, Senior Emergency Services Coordinator



Down

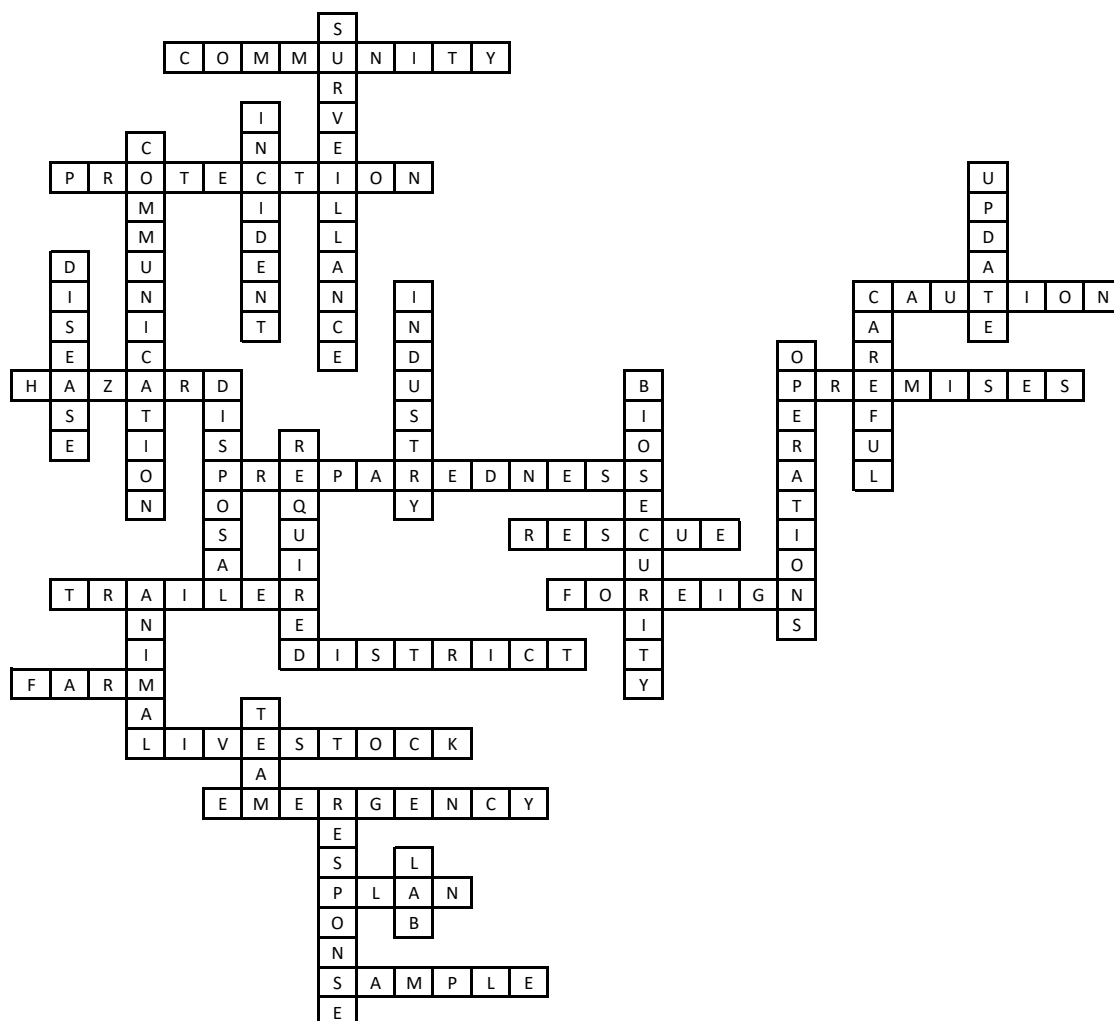
- 1 Essential, indispensable
- 2 Freedom from the occurrence or risk of injury, danger, or loss
- 3 To put on
- 4 Measures aimed at preventing the introduction and/or spread of harmful organisms
- 5 Preservation from injury or harm
- 6 A tract of land on which crops and livestock are raised for livelihood
- 10 To furnish or provide with what is lacking or requisite
- 11 A scheme or method of acting in advance
- 14 Substance used for washing and cleansing purposes
- 15 To remove dirt or any matter by dipping, rubbing, or scrubbing in water for the purpose of cleansing
- 18 Jargon for process of removing or neutralizing chemical or biological agents so they no longer pose a hazard
- 20 A piece of land together with its buildings
- 22 An answer or reply
- 24 More or less solid nourishment, as distinguished from liquids
- 25 Brand of nonwoven product consisting of spun bond olefin fiber used as protective apparel
- 26 Free from dirt; unsoiled

Across

- 2 Something considered by an authority as a basis of comparison
- 7 Alertness and prudence in a hazardous situation
- 8 Cautious in one's actions
- 9 Any such living thing other than a human being
- 12 Free from or not exposed to danger or harm; safe
- 13 Consisting of two or more monolayers
- 16 Customs and regulations dealing with diplomatic formality, precedence, and etiquette
- 17 Trade or manufacture in general
- 19 To put in proper condition or get ready
- 21 To have need of
- 23 To remove from the body
- 27 Illness, sickness, ailment
- 28 A health risk posed by the possible release of a pathogen into the environment
- 29 Sudden, urgent, usually unexpected occurrence or occasion requiring immediate action

Answers will be posted in the Oct. 2022 Newsletter

April 2022 Crossword Puzzle Answers



Contact Information



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FOOD & AGRICULTURE

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and
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