WILDFIRES & CATTLE HEALTH

A GROWING CONCERN FOR THE LIVESTOCK COMMUNITY

by University of California Cooperative Extension personel Gabriele Maier, Ph.D. , DVM; Tracy Schohr, Betsy Karle, Ph.D.; and Kathleen O'Hara, Ph.D. for the California Beef Cattle Improvement Association

Last year's air quality, affected by smoke and ash, was the worst on the planet for several weeks in large parts of California, raising concerns not only for human health but also for the health of cattle and other livestock. Researchers at University of California (UC) Cooperative Extension and UC Davis are exploring the risks these pollutants pose to cattle health.

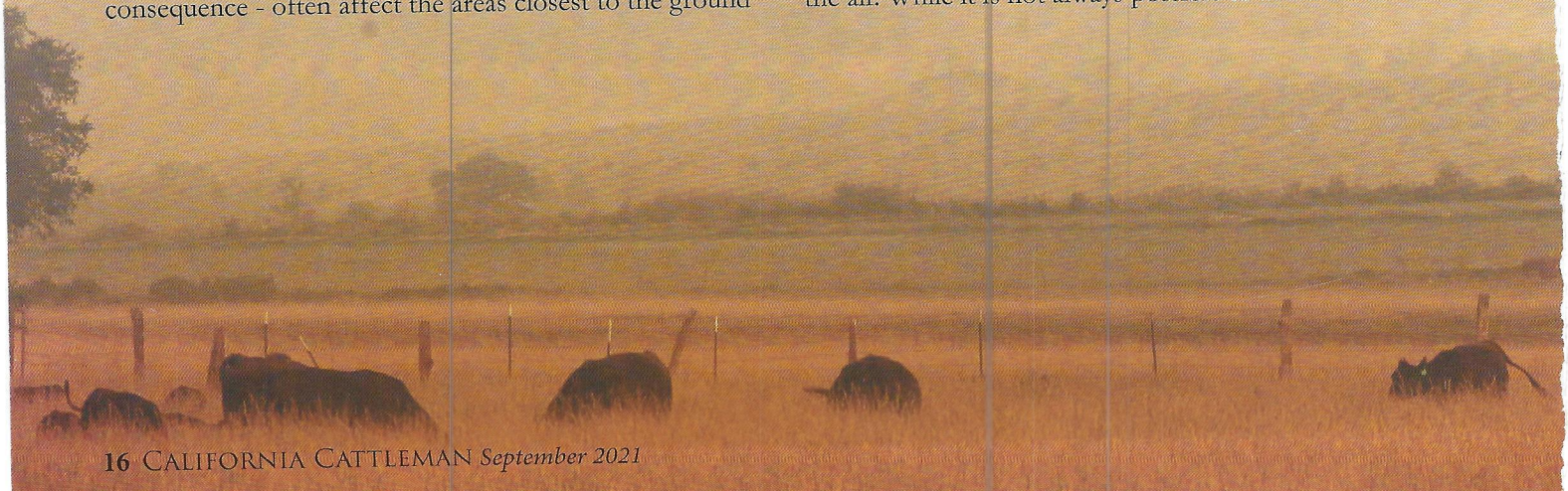
Over the last few years, California has endured record-breaking wildfires, including the Camp Fire in 2018- the deadliest wildfire in California history, devastating the town of Paradise - and the largest wildfire season on record in 2020, with almost 10,000 fires burning more than 4% of the state's surface area. The current year, characterized by serious drought, is unlikely to offer much relief from this trend, with the Dixie Fire in Butte, Plumas, Tehama, and Lassen counties, and the Bootleg Fire in southern Oregon giving an early start to the wildfire season. Apart from the destruction of land and property and the human suffering caused by these fires, cattle health has become a concern for ranchers, experiencing direct and indirect consequences of wildfires.

Direct Fire Impacts on Cattle

Direct consequences are those caused by the fires themselves, such as the loss of cattle that are unable to find shelter or be evacuated in fast moving fires. Burn wounds of cattle that survive a wildfire - another direct consequence - often affect the areas closest to the ground such as the feet, udder or male genitalia, but also the face. Damage caused when cattle walk over hot ground during a fire may result in hoof wall separation with signs starting even weeks later. When owners notice lameness in cattle sometime after a fire, the connection is not always obvious. Unfortunately, the prognosis for these cattle is not good and they often have to be culled or euthanized if unfit for transport. Burned faces and muzzles may lead to reluctance eating. Soft feed, e.g. hay that has been soaked in water, may be tolerated better than food that requires more chewing. Lactating cattle that have survived a fire should have their udders examined to make sure teats are still functional. Bulls should undergo breeding soundness exams before the next breeding season to ensure their reproductive organs did not suffer damage. Finally, smoke inhalation can cause direct damage to the lungs and lead to pulmonary edema with respiratory distress and frothing at the nostrils or the mouth.

Indirect Fire Impacts on Cattle

Indirect effects of wildfires on livestock health are those that are not caused by the fires themselves but by the stress from evacuation, by commingling with cattle from other herds and possible exposure to infectious diseases, from possible exposure to toxins in feed and water, from a rapid change in diet resulting in gastrointestinal (GI) upset, or from long-term exposure to high particulate matter in the air. While it is not always possible to avoid adverse



effects from these exposures, it is good to be aware of the risks and how to minimize them.

Good records and individual identification, or at least a brand, will help ensure that cattle can be identified and make it back to the home ranch after an evacuation. A herd health plan that includes vaccinations against the most common infectious diseases will minimize disease outbreaks after cattle have been commingled with others. However, it is necessary to closely observe cattle after stressful events such as fires and evacuation to be able to intervene when stress precipitates respiratory disease. Feeding can become a challenge when regular feed sources have been destroyed. Feeding some concentrates, such as distiller's grains, can save on the amount of feed that needs to be provided, but should be introduced slowly and some roughage is always necessary to ensure GI health in cattle.

Livestock Forage and Water Quality Fire Impacts

After fires destroyed urban or wildland urban neighborhoods and with them vehicles, electronics, paints, pesticides and other household chemicals, there were concerns about the health consequences of ash potentially containing high amounts of toxins settling on pastures or contaminating water sources for livestock.

UC Cooperative Extension advisors searched literature for answers, but recognizing a void, set out to find answers for livestock producers after the 2018 fires. Local extension advisors across northern California took forage and water samples to find answers for concerns of livestock producers in the region.

Key Findings of Forage Samples in Butte, Lake, Mendocino, Tehama, Humboldt, Modoc, Placer, Nevada and Shasta Counties.

- Minerals were well below maximum tolerable levels (MTL) established for cattle by National Research Council (2005), except for potassium, which was detected at slightly higher levels in several samples.
- No detection of lead, mercury, arsenic, molybdenum or cadmium. Copper, manganese, zinc, iron and molybdenum were detected in some samples with most levels below the MTL.
- Few organic compounds belonging to diverse chemical classes (e.g. pesticides, environmental contaminants, drugs and other natural products) were detected. The positive results were inconsistent with compounds that would be expected in an environment affected by wildfire.

Key Findings of Water Quality Samples in Butte County in the watershed below the town of Paradise destroyed by the Camp Fire.

- All detectable minerals were below safe livestock drinking water concentration limits as established by the US Environmental Protection Agency.
- No detection of lead, mercury, arsenic, molybdenum or cadmium.
- No detection of volatile organic compounds (VOC's) in open waterways tested, VOC's are a concern in urban water systems post fire.

...CONTINUED ON PAGE 18

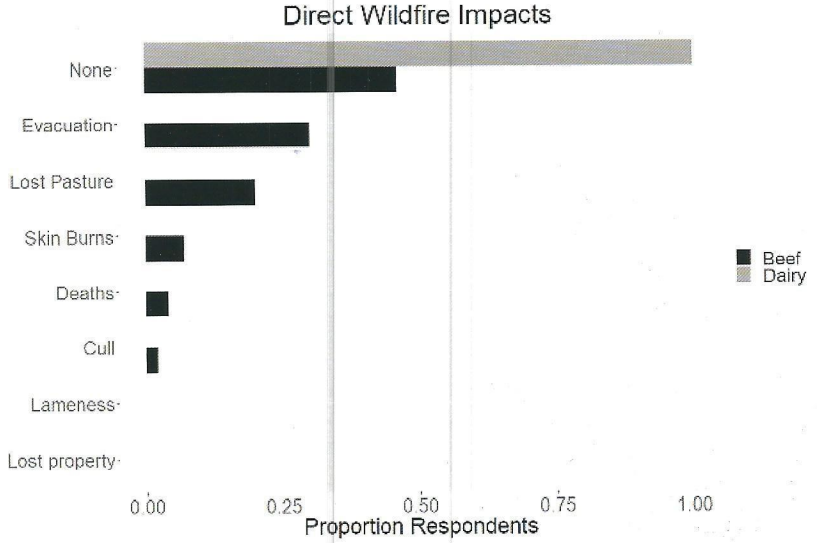


Figure 1: Proportion of respondents to a survey that reported experiencing direct wildfire impacts on cattle during or after the 2020 wildfire season in California or neighboring states, categorized as beef or dairy herds.

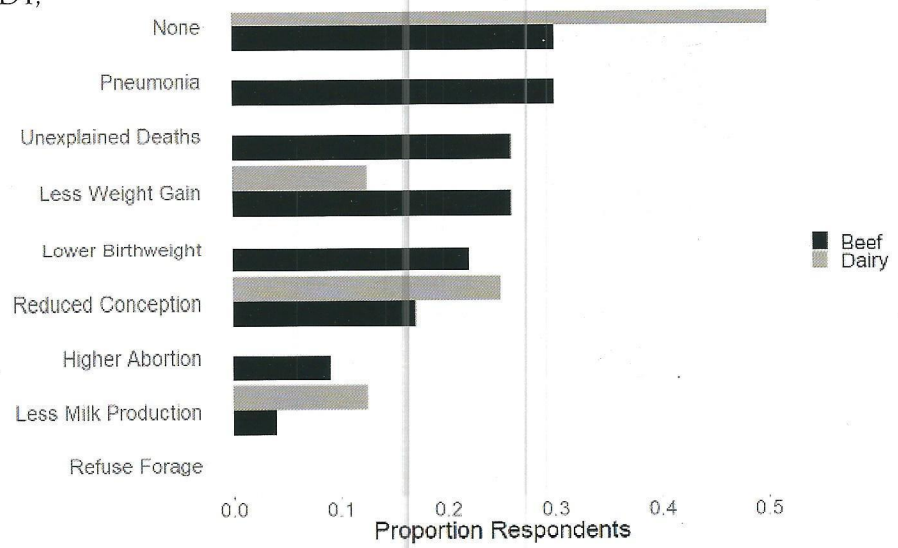


Figure 2: Proportion of respondents to a survey that reported experiencing health or production impacts in cattle during or after the 2020 wildfire season in California or neighboring states, categorized as beef or dairy herds.

Recognizing that cattle producers in California are always facing new challenges, RTAP will work to help you understand and adapt to new issues.

Examples of issues RTAP may be able to assist with include:

- State and federal labor laws
- Air quality regulations and permitting
- Access to public lands and grazing opportunities
- State and federal vehicular/transportation regulations
- Depredation/take permit compliance
- California State Water Resources Control Board (SWRCB) water rights applications
- SWRCB measurement and reporting regulations
- Rangeland water quality planning and state and regional water quality regulations
- Various state and federal permitting issues (lake and streambed alteration agreements administered by the California Department of Fish and Wildlife, dredge and fill permits through the Army Corps of Engineers, etc.)
- Safe Harbor Agreements
- Rangeland monitoring

3. Who is eligible for assistance?

All cattle producers in California can seek assistance at no cost.

4. If I call in for assistance on an issue who will be helping me?

When you contact RTAP you will be connecting with **Jack Rice** and Noah Lopez of Western Resource Strategies, LLC. Jack and Noah work with the team at CCA to provide the best technical assistance possible to cattle producers.

Prior to starting Western Resource Strategies, LLC, Jack worked for eleven years as an attorney with California Farm Bureau Federation, where he focused on water and environmental issues. In addition to consulting, Jack also owns and operates a small cattle and hay operation on the North Coast. Noah recently joined Western Resource Strategies, LLC after working several years in production agriculture and related businesses.

5. How can producers contact RTAP for assistance?

Livestock producers can reach out by calling (916) 406-6902 or emailing rtap@wrstrat.com.

6. How does the work of this program benefit all ranchers in California?

RTAP is available to all California ranchers. Any cattle producer struggling to deal with a regulatory or technical issue can reach out to RTAP and the team will work to help you understand what is required and how to fulfill those requirements. As RTAP assists cattle producers in grappling with regulatory requirements, it will provide valuable insights regarding the real-world challenges of California's complex regulations; CCA can use this information while working in Sacramento to reduce these regulatory burdens on ranchers.

7. Where can I go to keep updated on the program and learn more?

To stay current on special meetings or offerings through the program, visit https://calcattlecouncil.org/assistance or use the contact information above.

The California Cattlemen's Foundation will also be working with the California Cattlemen's Association, local Farm Bureaus and county cattlemen's associations throughout the state to provide updates and reminders about the program. Where appropriate to address specific regional issues, in-person technical assistance at industry meetings will be provided through RTAP.

8. Anything else producers should know about the program?

In the 2019 referendum to create the Council, the need for this type of assistance was repeatedly brought up as an example of the type of critical work that could be done if the Council was created. Getting this technical assistance program off the ground is an exciting step forward for the Council fulfilling its purpose and all efforts will be made to ensure this benefit serves as useful as possible for all cattle producers.