THE NEW FOOTHILL RANCHER

...Practical Information for Livestock Producers

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Managing Livestock Nutrition on Dry Forage

While May 2019 seemed more like March (we measured a whopping 5.84 inches of rain in Auburn – more than we measured in March, actually), June has marked a return to our normal late spring, early summer weather pattern. Our annual rangelands in the Sierra foothills and Sacramento Valley have turned from green to gold, and we've transitioned to our usual dry season grazing management strategies. For those of us grazing livestock on these dry annual rangelands, this means making sure our animals are getting enough protein.

A 2001 publication, *Annual Rangeland Forage Quality* (George, M. et al., UCANR Publication 8022), summarizes the seasonal variation in nutrition on annual rangeland. Not surprisingly, as our annual forages mature and die, their crude protein content declines, while crude fiber increases. Depending on the stage of production and class of animal we're grazing, we may not have adequate protein content in the forage for maintenance, let alone growth. Research done clear back in the 1930s demonstrates this transition in nutritional value (see the table below). Crude fiber is inversely related to digestibility. In other words, as crude protein declines and fiber increases, we can't meet the protein needs of the rumen microbes in our animals – the very microbes that can break down fiber in the forage.

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Stage of maturity	Crude Protein (%)			Crude Fiber (%)		
	Annual grass	Filaree	Bur Clover	Annual grass	Filaree	Bur Clover
Early vegetative	18	27	28	24	12	16
Late vegetative	15	25	27	25	14	17
Early flowering	15	22	26	26	16	19
Late flowering	10	16	22	29	21	23
Mature	6	10	19	33	26	26
Dry	5	7	18	34	28	28
Dry, leached	3	5	17	35	30	29

Source: Hart el al. 1932; Gordon and Sampson 1939

When we consider the minimum dietary crude protein needs of our animals, we see that dry annual grass and filaree fall short (and most of us don't have enough bur clover on our rangelands to make up the difference!). A 500 lb steer gaining 2.5 lbs per day requires about 12.5 percent crude protein in its diet (NRC 1984). Fall-calving cows or dry ewes, on the other hand, need just 7.5 percent crude protein. Part of our job as livestock managers is to match the nutritional needs of animals with the nutrition available from our forages.

However, even when we match our production system to the forage calendar, there will be a part of every year when the forage won't meet all of the nutritional demands of our livestock – and that's where strategic supplementation becomes important.

At a basic level, supplementation involves both providing an animal with nutrients that are otherwise deficient in its diet and overcoming limitations on digestion and intake as forage quality drops. Let me explain: as forage quality (that is, crude protein) declines, fiber fermentation slows in the animal's reticulum and rumen. This leads to slower absorption of nutrients and slower passage from the rumen. As forage quality declines, the forage has fewer digestible nutrients per lb consumed and the animal can consume fewer lbs of forage per day (for more information on this, check out "Cow Supplementation: Getting the Best Bang for Your Buck" by K.C. Olson in *Proceedings, The Range Beef Cow Symposium XXIV* – 2015). Dr. Olson offers this summarization of a successful supplementation strategy:

- Use supplements only if needed and when whey will enhance the nutritional value of your forage.
- Protein supplementation can increase intake and nutritional value of low-quality forages.
- Grain-based energy supplements that are high in starch and low in protein have a negative effect on forage intake and digestibility.
- To determine the most cost-effective protein supplement, differences in feed price, crude protein content, moisture content, and transportation costs need to be considered. [Note: I would also add the labor required to feed the supplement to these considerations – more on this in a moment].

Dr. Olson reminds us, "we need to always remember that we are feeding two sets of organisms when feeding ruminants, an ecosystem of rumen microbes and a herd of cows. If we don't meet the needs of the microbes first, we will be challenged to meet the needs of the cow."

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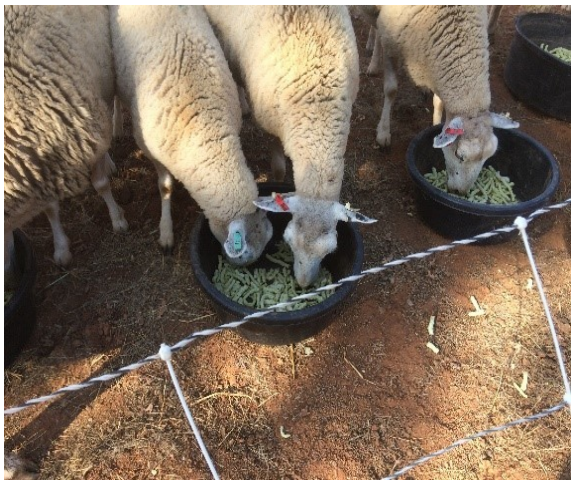
A protein supplement provides nitrogen to the rumen microbe population. Using this nitrogen, along with energy from other feedstuffs, the microbes synthesize microbial protein, which increases the animal's capacity to ferment fiber, thus increasing the rate and amount of digestion and passage, in turn stimulating increased intake of low quality forage. "Not only is the animal getting more energy and nutrients from each pound of feed consumed," writes Dr. Olson, "they are also able to increase the amount eaten." This is called a positive associative effect.

Grain-based energy supplements, on the other hand, lead to a negative associative effect. A high-starch energy feed that is low in protein does not support protein synthesis; rather, it shifts the rumen from fiber-fermenting bacteria to starch-fermenting bacteria. This further decreases the microbes capable of digesting low quality fiber. Grain-based supplements will also lower rumen pH, further limiting the function of fiber-fermenting bacteria. "Ultimately," says Dr. Olson, "even though additional energy is available from the starch, it substitutes for the lost energy from poorly digested fiber, leading to no net increase in energy intake for the cow, in addition to a continuing deficiency of protein."

To compare the price of one protein supplement to another, Dr. Olson suggests comparing the value of the crude protein in a particular feedstuff against other sources. For example, if you want to compare the cost of a cooked molasses protein tub (which many of us use) with alfalfa hay, you would walk through the following calculations:

Feed ($/ton) ÷ Dry Matter (%) ÷ Crude Protein (%) = Crude Protein ($/ton)

Feed	Feed ($/ton)	DM(%)	CP(%)	CP ($/ton)
Alfalfa hay	$250	89%	17%	$1652
Molasses tub	$700	95%	24%	$3070



Obviously, the cost of purchasing supplemental protein is not the only cost – we need to think about transportation, storage, and the labor involved in feeding it. Tubs are attractive because we can set them out and forget about them until the livestock have consumed them. Hay or bagged protein supplements, on the other hand, must be hand fed (although most bagged protein supplements limit intake through the addition of salt). In an informal experiment last year, we compared the cost per head per day of molasses tubs with bagged supplement. The tubs cost us $0.15 per head per day; the loose protein cost us $0.05-$0.10 per head per day (the variation reflects different levels of protein in the forage our sheep were grazing – consumption of the supplement declined when we had more protein in the forage).

Finally, strategic protein supplementation can also help us manage wildfire threat on annual rangelands. In addition to meeting the nutritional needs of our livestock, supplemental protein can increase the amount of dry vegetation our livestock will consume. Thinking about where this increased consumption (and other animal impact, like trampling) can provide strategic modification of fine fuels can be an important consideration. We've used this technique to impact paddocks along roads, around infrastructure (like wells and barns), and adjacent to neighboring properties.

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Fire Season is Upon Us

As spring turns to summer in much of the West, many of us who graze livestock on rangeland once again turn our attention to the threat of wildfire. After a record-setting fire year in California in 2018, many of us are bracing for another challenging summer and autumn.

Wildfire preparations are more complicated for commercial livestock operations. Like our neighbors, we need to create a fire safe space around our homes; we also need to think about protecting ranch infrastructure and livestock. If you haven't prepared a ranch fire safety plan, or even if you have one in place, the beginning of fire season is a reminder that we all need to be prepared! Here are a few ideas for putting together a plan for your operation.

Assessing the Threat

What is at risk in your operation? Do you have livestock in multiple locations? What is access like to your home place as well as to rented properties? As I think about our sheep operation, the following issues come to mind:

- We need to protect our home, barns and other infrastructure at our home place.
- We have livestock in several locations. Where we have irrigated pasture, we aren't quite as worried about fire. Where we're grazing on dry grass, we are more concerned. While fire is an immediate threat to the health and well-being of our animals, it can also reduce the amount of fall forage we'll have.
- Access can be a challenge during a fire. Single-lane roads, law enforcement road blocks and other obstacles may make it difficult to get our livestock during a fire.
- Smoke can create health problems for people and livestock alike. About ten years ago, during a particular smoky stretch of the summer, we had an increase in respiratory disease in our sheep.

Because many of us have operations that are spread over multiple locations, getting timely and accurate information about where fires are can be challenging as well. I find that a local news website in my area usually has the most up-to-date information on fire location and size. Local, state, and federal fire agencies may also send alerts when fires start near your location, although I've found that these apps don't provide the real-time information I need about small local fires. Many of us have informal phone trees with the other ranchers in our area - this can often be the best way to get in-the-moment information! Be sure you know the neighbors where your livestock are grazing!

Developing and Implementing a Plan

A ranch wildfire plan should have several main components:

1. ***Protecting Buildings, Infrastructure and Information:*** All of us should make our home places fire safe! Remove flammable vegetation within 100 feet of your home and other buildings. Don't forget other critical infrastructure like propane tanks, wells, equipment sheds and barns. Also be sure you have protected critical legal documents and insurance information. You can also check CalFire's suggestions for putting together an emergency supply kit (http://www.readyforwildfire.org/Emergency-Supply-Kit/).
2. ***Protecting Forage:*** Many of us stock our operations conservatively to ensure that we have fall forage for our livestock. You might consider creating fuel breaks to protect this forage. Disking or grading around the perimeter of pastures, or at least adjacent to potential ignition sources, can protect forage. Another alternative would be to use targeted grazing adjacent to roads or pasture boundaries - this can reduce the fuel load and slow a fire down. The width of any fuel break depends on the fuel type, topography/slope, and potential flame lengths that a fire might generate.
3. ***Protecting Livestock:*** We try to think ahead of how we might move animals out of harm's way. Given enough warning, we would either haul livestock away from a fire or herd them to a safe location. Many of us, however, have too many animals to evacuate on short notice. Leaving animals in pasture (or "sheltering in place") might be the best option in many cases. If you need to leave

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animals in place, be sure they have enough feed and water for several days. Will the animals have water if the power goes out? Be sure to take down temporary fences or other hazards that may injure animals as the fire moves through your property.

4. ***Water Supply:*** Water is critical for protecting our properties and for keeping livestock healthy. Do you have adequate water supplies for wetting down your buildings and facilities, or for directly fighting fire? If you have to pump water, do you have a backup system in case you lose power? Can you provide stock water if the power goes out? You may wish to consider investing in a backup generator and/or additional water storage.
5. ***Escape Routes:*** Ideally, we should all have at least two routes in and out of our ranch properties. I try to think about at least two alternatives for moving our livestock to safety in the event of a fire - and this means loading and unloading facilities, a plan for gathering livestock, and a clear understanding of the road system near our pastures. Narrow roads can be problematic for navigating with stock trailers, especially when fire equipment is also inbound.
6. ***Backup:*** Obviously, we can't all be on hand 24 hours a day, seven days a week to respond to a fast-moving fire. Consider working with friends, neighbors or colleagues to have a backup plan to evacuate or otherwise protect your livestock. Consider meeting with your neighbors to go over key livestock facilities, evacuation plans and access routes. Be sure to check in with these backup resources in the event of fire.
7. ***Communication Plans:*** Do you have phone numbers for the other ranchers in your area? Do you know who runs the cows or sheep next door? Most of us probably do! During fire season, many of us text or call our neighbors when we see smoke. Consider formalizing these calling trees.
8. ***Situational Awareness:*** If you're like me, your ear can tell the difference between a fire plane and a regular aircraft. Whenever I'm outside this time of year, I scan the horizon for smoke - especially when I hear fire planes overhead. I carry fire tools and a 5-gallon backpack pump in my truck during fire season, as well, and I'm constantly aware of my surroundings when I'm working in dry grass or brushland. And pay attention to where ranch visitors park – a catalytic converter on dry grass can be disastrous.

Writing Down your Plan

Even for ranching operations with few or no employees, writing down your plan can help others (spouses, neighbors, etc.) know what to do and who to contact in case of fire. A written plan should include the locations where livestock are grazing (which suggests this plan needs to be updated as livestock are moved). Location information should include a physical address and/or map, along with the number and class of animals on site. A written plan should also include a description of potential evacuation routes (including locations of loading facilities). Are there safe zones (like dry lots or irrigated pastures) on the property or nearby where animals could be moved if evacuation isn't possible? Is there an onsite caretaker or neighbor you can call in case of emergency? Are there other ranchers who could help you? What are the numbers of livestock haulers who might be available? A template for this plan available at https://ucanr.edu/sites/Livestock/files/288890.pdf.

Share a copy of this plan with other people in your operation – your spouse, your partners, and/or your employees, at a minimum. Consider sharing this plan with your landlords, as well. Since animal control is often involved in emergency situations, consider providing a copy (or at least a list of locations where you have livestock) to your local fire, animal control, and law enforcement agencies.

Wildfire, obviously, is a significant threat in our region - and one that can be incredibly stressful to livestock and people alike. Preparation - though planning, improving our stockmanship skills, making our homes and ranches fire safe - can help reduce this stress.

Planning for Planned Power Outages

By now, most of us have heard that PG&E will be shutting down the power grid during periods of high fire danger. Some of us may have even experienced a shut-down in early June. According to PG&E, a planned outage will take place in the following circumstances:

- During a red flag warning issued by the National Weather Service
- When strong winds are forecast for a region
- During periods of critically low humidity
- In areas with critically dry vegetation that could fuel a wildfire
- Due to on-the-ground, real-time observations by PG&E field crews

To help customers prepare for these outages, PG&E has developed a helpful check list (go to: https://www.pge.com/includes/docs/pdfs/myhome/customerservice/outages/PlannedOutageChecklistV3.pdf).

In addition to these tips, ranchers should also consider the following potential impacts:

- Do you have back up power for refrigeration? Vaccines, meat inventory, and other critical items could be lost during an extended hot-weather power outage.
- Is your stock water dependent on electricity? Many producers use well water for livestock – do you have alternative sources of water? If the power is out for multiple days, how and where will you get water to your livestock?

Coccidiosis in Sheep and Goats

Coccidiosis is parasitic disease in the intestinal tract of animals caused by a single-celled protozoa. The disease spreads through contact with infected feces or ingestion of infected tissue. The primary symptom is diarrhea. While coccidia can infect a wide variety of animals, they are usually species-specific.

In sheep and goats, coccidia are nearly always present in the flock. Most adult animals carry coccidia but are immune to clinical disease. Most often, we see symptoms (diarrhea, which may contain blood and/or mucus) in lambs or kids, especially during times of stress (like weaning, or the transition to hot weather). Severe infections can result in death; chronic infections result in “poor doing” lambs or kids and create long-term intestinal damage.

Coccidia have a complicated 21-day life cycle. Oocytes (eggs) from adult protozoa are released via feces into the environment. These eggs “hatch,” which is enhanced by warm, moist conditions. Early development during the first 16 days following ingestion initiates damage without clinical symptoms. Diarrhea can occur after day 18. The implications of this complex life cycle is that there is a gap between the observable symptoms and egg excretion, so fecal egg counts are not always a good indicator of infection. If you suspect death losses due to coccidiosis, a post mortem examination (at the California Animal Health and Food Safety lab at UC Davis) is the best way to confirm this diagnosis.

Prevention measures should focus on reducing the fecal-to-oral transmission of the pathogen. Keep maternity areas and lambing pens clean and dry. Avoid overcrowding in feeding pens, and elevate feeders (to avoid feeding on the ground). Keep water troughs clean, as well. Wean lambs or kids by moving the ewes or does and allowing the young animals to remain in familiar surroundings. Consider fence-line weaning where possible.

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Coccidiostats are feed additives that can help prevent coccidiosis. Be sure to read the labels on these products – they are approved for specific age classes and growing conditions. Bovatec® (lasalocid) is FDA-approved for confined sheep. Rumensin® (monensin) is FDA-approved for confined goats. Deccox® (decoquinate) is FDA-approved for young, non-lactating sheep and goats. Rumensin® can be toxic to dogs and horses – and to sheep and goats if not mixed properly. Always use a feed mill to mix any feed containing a coccidiostat. Coccidiostats should be used strategically, as resistance will likely develop with continuous use.

Coccidiostats have no meat withdrawal period; subsequently, their use is permitted under most "natural" standards. According to the University of Maryland, oregano oil can be used to prevent and treat coccidiosis.

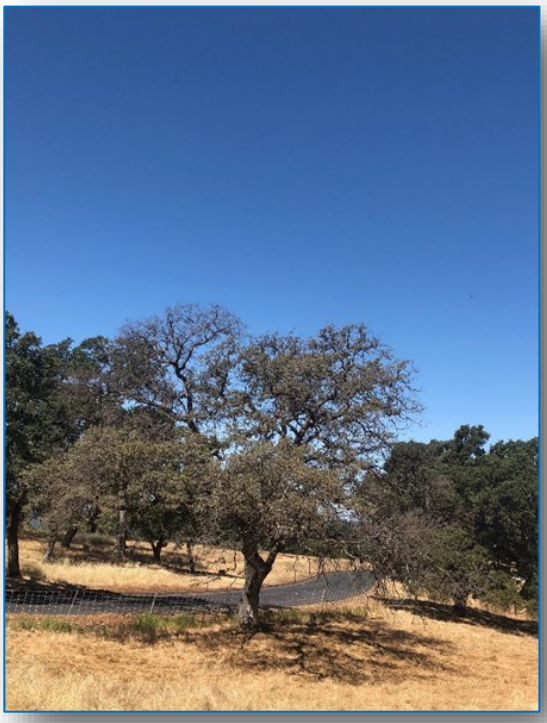
Conventional dewormers have no effect on coccidiosis. Treatment options (once symptoms are observed) include Corid® (amprolium), which is available over-the-counter. Other treatment options include sulfa medications, which now require a veterinarian's prescription in California. Whenever medications are administered in the water (as with Corid®) it is critical that the medicated water be the only source. Drenching each animal individually is usually more effective, but can be time and cost-prohibitive for larger groups of lambs or kids. As always, use these products according to label requirements and instructions from your veterinarian.

Sierra Harvest Land Match Program

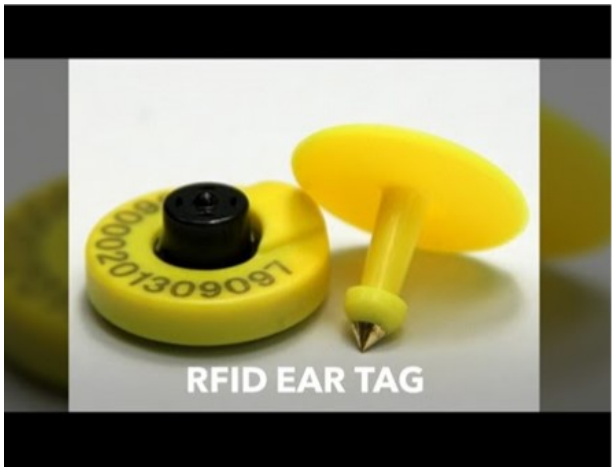
Sierra Harvest, a nonprofit based in Nevada County, has established a Land Match program designed to match landowners with farmers and ranchers who are looking for land. Landowners can list properties that are available for agriculture; producers can view listed properties or complete an inquiry to help find a match. For more information, go to https://sierraharvest.org/farmers/land-match/.

Observations of Blue Oaks Needed

Several ranchers have contacted me over the last several weeks about their observations of blue oaks that seem to be dead or dying on our foothill rangelands. If you've noticed any blue oaks that seem to be dropping leaves at this time of year or that appear to be partially dead, please let me know at dmacon@ucanr.edu. I am working with a specialist from UC Berkeley to determine if there is in fact a disease and/or weather-related cause.



USDA Will Require RFID Brucellosis Tags



Beginning January 1, 2023, USDA has mandated that all cattle that require official identification under current brucellosis regulations must have official radio frequency identification (RFID) ear tags.

This change will allow animal health officials to locate specific animals quickly during an outbreak. The transition will occur over several years. "While electronic identification is critical for modernizing animal disease traceability," USDA says, "[we] understand this represents a big change for the industry and individual producers."

Animals that will require official, individual RFID tags include:

- **Beef cattle and bison that are:**
  - ◊ Sexually intact and 18 months or older
  - ◊ Used for rodeo or recreational events (any age)
  - ◊ Used for shows or exhibitions
- **Dairy cattle:**
  - ◊ All female dairy cattle
  - ◊ All male dairy cattle born after March 11, 2013

The transition will be made with the following mileposts:

- December 31, 2019: USDA will discontinue providing free metal tags. Approved vendors may still produce official metal tags for one additional year. These tags will be available for purchase on a state-by-state basis through December 31, 2020.
- January 1, 2021: USDA will no longer approve production of metal ear tags with official USDA shield. Veterinarians and/or producers can no longer apply metal tags for official identification and must start using only official RFID tags.
- January 1, 2023: RFID tags will be required for beef and dairy cattle moving interstate. Animals previously tagged with metal ear tags will have to be retagged with RFID ear tags in order to move interstate. Feeder cattle and animals moving directly to slaughter are not subject to RFID requirements.

While USDA is working with state animal health officials to share the cost of official RFID ear tags, these new tags will not be available for free (as the metal tags are). For more information, go to https://www.aphis.usda.gov/publications/animal_health/traceability.pdf.

Complete the Ranch Management Survey for the chance to win a YETI cooler!

The Animal Science Department of University of California, Davis is conducting a survey in order to design an effective rancher educational program. All collected information will remain anonymous, and will be used to improve educational programs as well as continue to benefit to the beef industry. Prizes include a YETI cooler, YETI cups, hats, gift cards and more!

In order to be considered, survey results must be received by September 30th, 2019 and prizes will be sent out in October 2019.

Click **HERE** to complete the survey to win!

Summer Workshops Calendar

July 2019	
July 23 **9:30a—2:30p** **$15/person** **Includes Lunch**	**Livestock Protection Tools Field Day** *Willow Creek Ranch, Susanville, CA* (for agency staff) *This field day will feature hands-on learning with a variety of livestock protection tools, information on livestock guardian dogs and livestock carcass disposal, and updates from UCCE and wildlife management agencies.* Register at: https://ucanr.edu/survey/survey.cfm?surveynumber=27854
August 2019	
August 29 **8:30a– 12:00p** **$5/person**	**Shepherding Skills Workshop: Preparing Ewes for Breeding** *Oak Hill Ranch Auburn, CA* *Learn about managing ewe and ram nutrition, breeding systems, and genetic selection.* Stay tuned for registration information
September 2019	
September 13-14	**Beginning Farming Academy** *UCCE-Placer Auburn, CA* *This two-day intensive academy will help aspiring farmers and ranchers learn to analyze economic opportunities in foothill agriculture. Topics will include business planning, assessing your market, and action planning.* Watch for the application in early August!
September 19 **$15/person** **Includes Lunch**	**Livestock Protection Tools Field Day** *Oak Hill Ranch Auburn, CA* (for agency and NGO staff) *This field day will feature hands-on learning with a variety of livestock protection tools, information on livestock guardian dogs and livestock carcass disposal, and updates from UCCE and wildlife management agencies.* Stay tuned for registration information!

Stay tuned to the Ranching in the Sierra Foothills Blog for updates!

https://ucanr.edu/blogs/RanchingintheFoothills/

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