THE NEW FOOTHILL RANCHER

...Practical Information for Livestock Producers

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Costs vs. Benefits: The Economics of Using Livestock Guardian Dogs

Like any livestock management tool, livestock guardian dogs come with both costs and (hopefully) benefits. Some of these are easily calculated - for example, through September, we've spent $624.70 on dog food and veterinary costs related to our livestock guardian dogs this year. We currently have 3 dogs (Bodie, a 3-year-old I purchased as a pup for $350; Elko, a 2-year-old given to me as a pup; and Dillon, a 9-month-old pup purchased for $500 in April). Some of the costs and benefits are less easily calculated, however; how do I know how many sheep didn't die because we had dogs with them? What is the value of my own peace of mind? A recent paper by Dr. Ellen Bruno (Cooperative Extension specialist in agriculture and resource economics at UC Berkeley) and Dr. Tina Saitone (CE specialist in agriculture and resource economics at UC Davis) sheds new light on these questions. The complete paper is available at http://ucanr.edu/gianninifoundation_livestockguardiandogs.

Using data from the University of California's Hopland Research and Extension Center, Bruno and Saitone estimated that dogs reduced lambs lost to coyotes by 43% each year; ewe losses were reduced by 25%. The authors calculated the present value of these prevented deaths over the 7-year useful life of the dogs to be $16,200 (present value calculations were based on the market value of the lambs as well as the value of running-age ewes). Their model was based on using one dog per 100 ewes (more on this below).

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On the cost side, the authors included initial purchase of pups, dog food (and labor associated with feeding the dogs), veterinary costs, and dog replacement costs. Labor costs, as they note, are largely dependent on the type of production system - Hopland's labor costs are probably much higher than the typical commercial operation. Using net present value analysis, Bruno and Saitone found that the costs of Hopland's livestock guardian dogs exceeded the benefits (in the value of lambs and ewes not killed by predators) by $13,412 over the seven-year analysis period. In other words, the dogs didn't pay their own way.

Bruno and Saitone offer several important caveats when interpreting these results. First, many ranchers report that dogs eliminate predation entirely (which has been our own experience). If this had been the case at Hopland, the benefits would have exceeded the costs of using dogs by over $12,000. Second, labor-related expenses associated with dogs can be difficult to quantify. In our operation, feeding the dogs is part of our daily check of fences and sheep - we see the sheep every day whether we have dogs with them or not. We charge about 5 minutes per day to feeding 3 dogs - even if I pay myself $20 per hour for this work, our "dog" labor amounts to $371 per dog annually. Hopland, on the other hand, reported labor costs of nearly $1,600 per dog per year. Finally, the authors note that lamb and ewe prices may (and usually do) change from one year to the next - and sometimes dramatically. Sheep values can alter the cost-benefit ratio.

Skeptics might wonder, "Even if you use dogs, if you're not experiencing any predator losses, maybe there aren't any predators around." My ongoing research into livestock guardian dog behavior suggests that there are ALWAYS predators around where small ruminants are grazing (whether on rangeland or irrigated pasture). Using trail cameras, we frequently "capture" coyotes, foxes, and bobcats within 10-15 feet of our sheep paddocks. Interviews with sheep- and goat herders working in the Sierra Nevada indicate that coyotes are heard - and often seen - every night near sheep and goat bed grounds. Though we see them less frequently, we know there are mountain lions and black bears in the vicinity of these operations. The predators are there - the dogs must be at least partly responsible for the lack of predator losses!

As I've written previously, the number of dogs used by producers can vary greatly - from one producer to the next, and from one season to the next on the same operation (see the next article). One of the bands of sheep I studied this summer near Truckee was guarded by a single dog (a band is roughly 1,000 ewes - this scenario is significantly more cost-effective than the 1 dog per 100 ewes ratio used in Bruno and Saitone's model). This ratio works because the band is comprised of mature ewes without lambs - and because the predators have plenty of other prey at this time of year. Once this band moves back to Los Baños to lamb on alfalfa stubble later this fall, the dog-to-sheep ratio will increase.

Finally, peace of mind for the shepherd (or goatherd) can be a significant (if qualitative) benefit. Brad Fowler and Nathan Medlar recently completed a targeted grazing project at Squaw Valley Ski Resort north of Lake Tahoe. They started the project without livestock guardian dogs (mostly to avoid conflicts with recreationists). They herded the goats on the ski slopes during the day and penning them at night near their camp (a tent on the side of the mountain). Brad reported that neither they nor the goats slept at all on the first night - the coyotes kept the goats stirred up even though they were protected by electric fence. Brad and Nathan added two dogs on the second day - which relaxed the goats (and the goatherds). Brad reported both herders and livestock slept soundly on the second night.

Finally, research at the U.S. Sheep Center in Dubois, Idaho, found "that ewes grazing with accompanying LGD will travel greater daily distances compared with ewes grazing without LGD accompaniment. As a result of traveling greater distances, ewes may also be exposed to more and varied foraging opportunities" (Webber et al. 2015). To me, this suggests that dogs may make our grazing operations more efficient - allowing us to access forage that would otherwise not get grazed by unprotected livestock. This increased grazing efficiency can reduce our supplemental feed costs.

From my perspective, perhaps the most important part of Bruno and Saitone's work comes at the end of the paper:

"Sheep producers who are considering the purchase of LGDs, or those who already have LGDs and are interested in their return on investment, need a few pieces of data to make this determination. Market lamb and

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ewe prices are typically well known to producers and can be used, in conjunction with efficacy rates from this study, to estimate the benefits of LGDs."

"On the cost side, producers would need to make some logical forecasts about the time required to maintain LGDs, given their operation specifics.... Also, using guidance from the literature included herein, producers could calculate the likely dog cull and mortality costs of the LGD's useful life."

Ultimately, the success of any livestock protection tool (including lethal control) is highly variable depending on operator characteristics and environmental conditions. Dogs work in our operation because we see the sheep every day and because they are our only option for protecting lambing ewes (we lamb on pasture without access to a lambing shed). Dogs work for the range outfit on the Tahoe National Forest as well; human presence, the vigilance of the dogs, and the stage of production during their time in the mountains virtually eliminates predator losses. And dogs work for the targeted grazing outfits I work with in the foothills and mountains; peace of mind and lack of predator losses justify the costs of keeping dogs in these operations, too.

How Many Dogs?

One of the questions I'm asked most frequently when it comes to livestock guardian dogs is, "How many dogs do I need to protect my sheep/goats/cows?" As you might imagine, the short answer is, "It depends." The long answer is more complex. From an economic perspective, the answer is, "As many as it takes to hold predator losses in your operation at an acceptable level, but no more than that." From a production perspective, I've found that the answer depends on operational characteristics, the environment, and the abilities of the specific dog(s).

While it is tempting to try to develop a rule of thumb recommendation (like one dog per 100 ewes), reality is usually more complicated. The fundamental question comes down to comparing the costs of a dog versus the benefits the dog provides, as the previous article illuminates. I suspect we'd lose more sheep if we didn't use dogs, but I'm not willing to leave the sheep unprotected to find out!

Operational characteristics, in my experience, play a significant role in determining the optimal number of dogs. Birthing seasons (spring vs. fall), other livestock protection tools (like electric fence, on-site herders, night penning, etc.), grazing management (set stocking versus rotational grazing), and the number of individual herds or flocks all factor into determining the right number. Using our operation as an example:

- We lamb in the late winter and early spring, when there is not a significant natural prey base for the wild predators in our environment. Our lambing paddocks are 7 miles from our home. ***This argues for more dogs.***
- We use electro-net fencing, which definitely deters canine predators (dogs, coyotes and foxes) as well as bobcats. ***This allows us to get by with fewer dogs.***
- We move the sheep frequently - they move to fresh pasture every few days, and graze different properties in spring/summer versus fall/winter. I suspect all of this movement keeps the predators off balance. ***This allows us to get by with fewer dogs.***
- We rarely (if ever) have all of our sheep in one mob. During the summer, the mature ewes are in one flock; the feeder lambs and replacement ewe lambs are in a second flock; the rams in a third location. During breeding season, we have two separate breeding groups plus a group of lambs. ***This argues for more dogs.***

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Based on these factors, we feel that we need at least three dogs for our small, part-time operation (around 150 head of mature sheep total). With three dogs, we can protect three different groups of sheep or place two dogs together during our most vulnerable time of year (lambing). During some parts of the year, we have more dogs than necessary, which provides flexibility if we begin to have problems with predation.

The environment where we're grazing, and the predators it contains, is a second critical consideration. Here in the Sierra foothills (at least at the moment) our main predators (in order of potential threat) are domestic dogs, coyotes, mountain lions, black bears, bobcats, foxes, and birds of prey. I've spoken with ranchers on the north coast who would add crows, ravens, and magpies to that list. And ranchers in northeastern California would add gray wolves. Predator density and prey base also come in to play. Are there several established packs of wolves in the region? Is there sufficient native prey? Are these particular wolves (or coyotes, or mountain lions) known to prey on livestock? Each of these questions are important to consider when determining how many dogs a particular operation might need.

Finally, every livestock guardian dog is an individual. Some are athletic and want to patrol a wide area; others want to stay with their livestock. Some dogs are more canine aggressive than others (an important trait in wolf habitat); others will harass bears. And these traits will change over time - a dog that was aggressive and athletic in his younger days might be content to stay with lambs on irrigated pasture in his later years. In my experience, there is more variation between individuals than there is between livestock guardian dog breeds.

This summer, I tracked the movements of four dogs (2 each in separate 1000-ewe bands of sheep) grazing on the Tahoe National Forest in Nevada and Sierra Counties (in an area that a collared Oregon wolf has been known to visit in the last 12 months). This is a long-time producer with experienced herders operating on open range with no fences. They typically use two dogs with one band and three dogs with the other, and have additional dogs they can add to each band if predator problems begin to escalate. This year, they had 0 predator losses while running more than 2100 ewes on the Tahoe National Forest from early July through the third week of September.

I think this illuminates the "it depends" answer in my first paragraph! They have 1 dog per 400 sheep; we have 1 dog per 51 sheep. They are grazing mature ewes in a relatively wild environment for only 75 days - and at a time when the natural prey base is plentiful. We need more dogs to protect ewes and lambs at an especially vulnerable time of year (and I should note - the large operation needs more dogs at lambing as well). The common thread for each of these operations, however, is that we are constantly evaluating our need for predator protection against the cost of providing it. If we could get by with fewer dogs, we would; similarly, if the large operation needs more dogs during summer, they'll add dogs. In other words, it depends!

Smutgrass: A Growing Problem on Irrigated Pasture

Smutgrass (*Sporobolus indicus*) is a warm-season perennial grass native to the tropics. Since it is well-adapted to warm summer temperatures, we seem to be seeing more of it on foothill and Sacramento Valley irrigated pastures. With a combination of coarse leaves and spiky seedheads, smutgrass is largely unpalatable to livestock. Since livestock will generally graze the plants they prefer rather than smutgrass, it can dominate irrigated pasture and cause significant reductions in grazing capacity. For a comprehensive description of smutgrass biology and control measures, be sure to check out the UCANR publication, Managing Smutgrass on Irrigated Pasture (Davy et al. 2012).

Smutgrass, in my experience, is a complicated, opportunistic weed, by which I mean there neither seems to be any single factor that contributes to its spread, nor any single management technique that leads to its eradication. Smutgrass seeds require bare ground, sunlight, and warm temperatures (68°F to 95°F) to germinate. Management practices (like pasture harrowing), or pests (like gophers) that lead to bare ground may provide a toehold for smutgrass establishment.

As part of a collaborative research project with the UC Rangelands lab at UC Davis, we have grazing exclosures established on several irrigated pastures on the eastern edge of the Sacramento Valley. The grazed

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portions of these pastures have significant smutgrass populations; the exclosures, where the forage grows all season without being removed, have little or none. To me, this suggests that getting the grazing right on our pastures may be part of the answer. If we can graze our pastures to 4-6" of stubble height, and then allow sufficient time for the desirable forage plants to regrow before we graze again, perhaps we can allow these "good" plants to outcompete smutgrass. On paper, this sounds easy; out in the pasture, it requires us to vary our graze periods and (more importantly) rest periods based on the growth rate of the pasture. Our rest period in June might be 25 days; in August it might be 40 days! Not every operation is set up to accommodate this variability.

We have noticed that dry ewes are more likely to graze smutgrass than lambs, particularly early in the season. Other producers have observed that goats will graze smutgrass. Davy et al. suggests that this may be related protein levels and digestibility. Clipping (or grazing) can maintain smutgrass in a more vegetative state, increasing palatability and nutritional value.

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Managing Smutgrass in Irrigated Pastures

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Small smutgrass (*Sporobolus indicus*, also called smutgrass) is a tufted perennial grass native to tropical America (fig. 1). Although it occurs as a weed in many different areas, it is most problematic in pastures in the southern and western United States. Because smutgrass is unpalatable to livestock, animals avoid grazing it, and it quickly dominates irrigated pastures, causing significant reductions in livestock grazing capacity. Smutgrass is well adapted to the warm summer temperatures of the Sacramento Valley, particularly in irrigated areas. Its name is derived from a black fungus that often develops in its seed head in humid areas (fig. 2). This fungus has not been found in samples from the Sacramento Valley.

Figure 1. Mature smutgrass plant.

Figure 2. Smutgrass inflorescence, one green and one mature and drying as seen from mid to late summer.

Smutgrass Biology

- Smutgrass is a warm-season perennial it remains dormant in the winter, begins growing in spring, and produces seed from July to September, depending on elevation.
- Individual plants can produce up to 45,000 seeds per year.

But even where we get the rest periods and graze periods right for the plants we want, we may still have smutgrass. Irrigation inefficiencies may favor smutgrass in some cases. Josh Davy and Betsy Karle found that smutgrass was significantly decreased on a pasture where irrigation was changed from a 14-day rotation to a 7-day rotation (with corresponding increases in more desirable grasses). I've noticed on the pastures that we irrigate for sheep that we seem to have more smutgrass in areas where shallower soils or lower water pressure results in less than optimal irrigation (in other words, we can't get enough water on these sites to maintain sufficient soil moisture in our 12-day irrigation rotation). And since our system is designed to run on 24-hour sets and 12-day rotations, we don't have a great deal of flexibility when it comes to addressing our smutgrass problem by adjusting our irrigation schedule.

Some producers in our region regularly clip their pastures to avoid eye problems and keep forage in a more vegetative condition. Research shows that repeated mowing can decrease the diameter of individual smutgrass plants but increase the density of the stand. Mowing may also spread seed. On the other hand, mowing may maintain the nutritional quality of smutgrass further into the summer (which may improve its palatability for livestock).

Finally, glyphosate (RoundUp) may be a viable control option. A rotary wiper allows the operator to adjust the height of the wiper drum above the desirable pasture plants and "wipe" the herbicide directly on the smutgrass plants. This application should occur shortly after grazing (so that the desirable plants are lower than the smutgrass). According to Davy et al., "glyphosate should be applied after flowering when the plants are translocating sugars back to the roots or below-ground reproductive structures (generally late summer and early fall). Managing Smutgrass on Irrigated Pastures contains a helpful guide to using glyphosate with a rotary wiper. The Tahoe Cattlemen's Association has a wiper that is available for rent through Far West Rents and Ready Mix in Lincoln. If you'd like help learning to use the wiper, contact me at (530) 889-7385 or at dmacon@ucanr.edu.

Weeds are often a symptom of a management problem, rather than the actual "disease" - if we don't address the underlying issue (in the case of smutgrass this may be grazing management, irrigation management, or other factors), the problem is likely to reoccur. And with a weed like smutgrass that seems to be so opportunistic, eradication may be especially difficult. Controlling it (rather than eradicating it) maybe the most cost-effective option.

Blue Oak Mortality on Foothill Rangelands

In the space of several days in early June, I received phone calls from two foothill cattle producers about an unusual number of dead and dying blue oaks on their annual rangelands. The first rancher's observations were limited to his home place; the second rancher was noticing the blue oaks dying on leased grazing land from Auburn to Nevada City. In mid-June, I visited one of these operations and noted several things:

1. Some of the trees that the rancher said had leafed out normally in spring appeared to be entirely dead and devoid of leaves.
2. Several trees appeared to be dying from the top down or on individual branches. Many of the leaves on these trees also appeared to be scorched.
3. These trees did not appear to have any lesions on their trunks - no wounds or noticeable fungal growth.

Since I'm not an expert on the diseases of blue oaks (or any other tree, for that matter), I contacted Dr. Matteo Garbelotto, a Cooperative Extension Specialist in Forest Pathology at UC Berkeley. Dr. Garbelotto has studied a variety of tree diseases, and he immediately suggested collecting samples from some of our foothill trees to try to figure out what was happening. In early August, Dr. Doug Schmidt from Dr. Garbelotto's Forest Pathology and Mycology Lab joined me in collecting samples. We collected leaves with evidence of scorching, soil samples from the base of infected trees, and tissue samples from the trunks at eight sites from Placer to Yuba County.

In late September, Dr. Garbelotto contacted me with some preliminary results:

"We found three pathogens

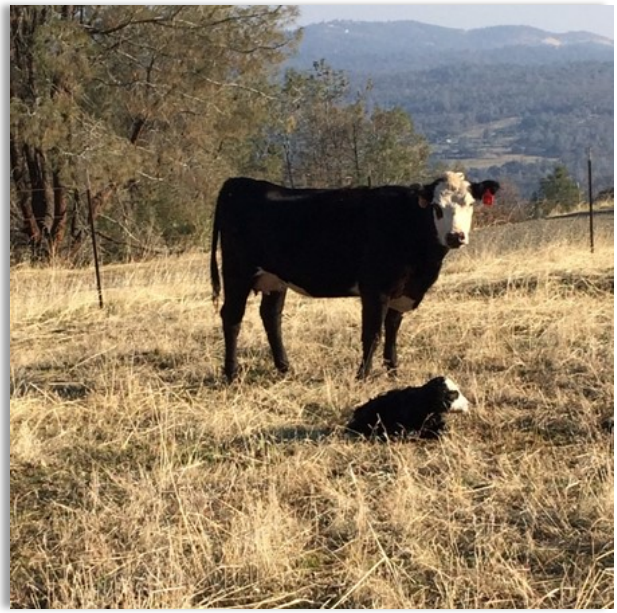
- *Diplodia corticola: oak canker fungus. This is notoriously activated by drought. Some oak families are much more susceptible than others (genetic predisposition is important). I believe this is probably the main cause of the mortality observed. We found it in the trees with the more advanced symptoms*
- *Laetiporus sulphureus: "chicken of the woods" is a root rot agent but normally regarded as a weak pathogen, we should regard it a s a secondary agent*
- *Pleurotus: another rot fungus that becomes active when trees are on their way out*

I think the mortality we are observing is the result of the prolonged drought. There may be also an enhancing effect of climate change, so hotter weather may increase the activity of the fungus, potentially starting a process of natural selection on blue oaks that may go on for a while, with cyclical die-offs 1 -2 years after the end of long drought periods."

I will be collecting some additional wood samples in the next several weeks so that Dr. Garbelotto's lab can run one more test. In the meantime, he indicates that landowners don't have many options to save infected trees at the landscape level; however, if the problem persists, we may be able to identify mother trees that are less susceptible to the canker and grow seedlings from these resistant trees. We'll be working on a plan over the winter months – stay tuned!

Preparing your Cow Herd for Breeding

As we reach mid-Autumn, fall calving season is winding up, and many producers are turning their attention to next year's calf crop. Many ranchers focus on bull fertility, or the bull's ability to get cows pregnant. During the UC Davis Beef Day at the UC Sierra Foothill Research and Extension Center in Browns Valley on September 24th, Dr. Bret McNabb of the UCD School of Veterinary Medicine suggested that we should also focus on cow fertility, which includes a cow or heifer's ability to:



- Cycle normally,
- Conceive a calf,
- Carry that calf to term, and
- Calve uneventfully.

Dr. McNabb indicated that while Expected Progeny Differences (EPDs) can help us make decisions about genetically matching the right bull with the right set of cows, and about selecting the right replacement heifers for our operations, we can take steps to further enhance the overall fertility of our cow herd. Nutritional status, reproductive disease prevention, and a heifer breeding soundness exam can help ensure successful conception, pregnancy, and calving next year.

McNabb said that dietary energy is especially important in the months leading up to breeding season, as is trace mineral balance (especially copper, selenium, zinc, and manganese). We can evaluate the nutritional status of cows and heifers by taking body conditions scores (BCS) at calving, breeding, and weaning. Ideally, cows should be a BCS 5-6 at calving; first calf heifers should be BCS 6-7. Since we only have 80-85 days to get cows re-bred after calving, nutritional status just prior to calving and for the subsequent 2-3 months is critical. Cows that are in moderate (BCS 5-6) to good (BCS 7-9) are far more likely to start cycling again within 60-90 days of calving that are thin cows.

We may also wish to do a breeding soundness exam on our first calf heifers prior to breeding. Elements to consider are body weight (heifers should be 50-60 percent of expected mature weight at breeding), body condition score, reproductive tract score, pelvic measurements, structural correctness, and perhaps temperament. Your veterinarian can help you with this.

As Dr. McNabb said, a trace mineral program is also critical. Our region of the Sacramento Valley and Sierra Foothills is typically deficient in copper and selenium. Copper is crucial for growth and development, immune system function, metabolism, and pigment deposition. Clinical signs of copper deficiency are often non-specific and may include weight loss, diarrhea, infertility, anemia, decreased hair pigment, spontaneous bone fractures, and weak immune system. Copper can be added to the diet through salt mix supplementation, through long-acting (6-8 months) copper boluses, or short-term via injection.

Selenium deficiency can cause white muscle disease in calves, and is also associated with a variety of reproductive problems, including late-term abortion, early embryonic loss, infertility, lowered sperm motility in bulls, and retained placentas. In addition, selenium deficient cattle may have diarrhea or decreased feed efficiency, and poor immune system response. Injectable selenium can provide a short-term boost in selenium levels; selenium rumen boluses may provide a better long-term solution.

Finally, you should consult with your veterinarian regarding your vaccination program. A number of viruses, especially Infectious Bovine Rhinotracheitis (IBR) and Bovine Virus Diarrhea (BVD) type I and II, can impact fertility. Bacterial diseases like leptospirosis, campylobacter (vibrio) and foothill abortion can also cause reproductive problems. Vaccines are available for many of these conditions; UCD researchers are nearing commercial production of a foothill abortion vaccine.

Is Your Farm or Ranch a Business?

According to the 2017 Census of Agriculture, there are 3,831 farming and ranching operations in Placer, Nevada, Sutter, and Yuba Counties. These numbers include large and small operations – full-time and part-time. And they include all types of production: row crops, rice, livestock, orchards, mixed vegetables, etc.

	Placer	Nevada	Sutter	Yuba
Number of Operations	1,237	673	1157	764
Average Size (Acres)	96	77	329	235
Percent of Operations with Positive Net Income	26%	25%	57%	37%
Percent of Operations with Loss	74%	75%	43%	63%
Average Net Income	$1,713	($9,702)	$89,199	$51,793

As these data suggest, larger farms and ranches tend to generate greater net income, which isn't surprising. But even small operations can generate profit! Why, then, are some agricultural operations profitable, while others are not? And what can you do to move your farm or ranch out of the red and into the black?

The Placer/Nevada office of UC Cooperative Extension has been holding farm and ranch business planning courses for the last 11 years. Our "So you Want to Start a Farm or Ranch" course helps aspiring producers start down the path of planning an agricultural operation. Our intensive two-day Beginning Farming Academy is designed to help people who have started an agricultural enterprise dive deeper into economic analysis, market analysis, and operations planning. And our 6-week, 8-session Farm and Ranch Business Planning Short Course helps established operations analyze their economics and develop a comprehensive business plan.

These kinds of programs make a difference. In 2016, we conducted a survey of farmers and ranchers who had participated in our Farm and Ranch Business Planning Courses (which began in 2008). Nearly 85 percent reported that their agricultural operations generated a profit and paid them a salary. Treating their farms and ranches as businesses, in other words, allowed them to continue producing.

Some might respond, "But I ranch for the lifestyle," and there is certainly some value in that. Dave Pratt, who has taught Ranching for Profit schools all over the West, would ask what provides a better lifestyle for you and your family? A business that requires you to work for free? A business that requires money from another job or business to stay afloat? Or a business that pays employees and the owner a reasonable wage? A business that generates an annual profit after paying all of its expenses? I know which lifestyle I would prefer!

For some farmers and ranchers, profit can almost seem like a dirty word. Many of us who have started small-scale, locally-focused farms and ranchers have done so (at least in part) because we've rejected the idea of corporate businesses driven solely to turn a profit. We pride ourselves on focusing on the mission of our agricultural businesses (to feed our community, or to improve the health of our land). But Sally Jewel, former Secretary of the Interior and CEO of REI, says, "There is no mission without margin." In other words, to accomplish the mission we envision for our farm or ranch businesses, we have to be economically viable. Two of the key questions we try to help farm and ranch businesses answer is, "How much profit do you need to produce, and what will you do with it?" Dave Pratt puts it this way, "Profit is to business as breathing is to life." That is, profit is not the reason that farm or ranch business exists, but it is crucial to that business's continued existence! And profit can be used for all sorts of things – invested into business expansion, saved to pay for a child's education or our own retirement, or even used to fund a vacation! Profit does have a purpose.

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Sustainability is a word that many of us use in describing our aspirations for our farms and ranches, or for our local food system. For me, sustainability has three elements: ecological sustainability, social sustainability, and economic sustainability. I look at this as a three-legged stool – one that will fall over if any of the legs is missing. From my perspective, the environmental and food system benefits of "sustainable" farms will disappear if these farms can't stay in business. Profitability is the key!

Be sure to watch the calendar on our Foothill Farming website (https://ucanr.edu/sites/placernevadasmallfarms/) for upcoming workshops and classes.

If you're thinking about starting a farm or ranch business, we're offering our ***"So you want to start a farm or ranch…"*** workshop on Thursday, November 7 at the Placer Business Resource Center in Rocklin. Register here: https://ucanr.edu/sites/placernevadasmallfarms/?calitem=463380&g=22527

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

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