Multispecies Grazing: Benefits of Sheep Integration on Rangelands

Jaelyn Whaley, SDSU Extension Sheep Field Specialist
Jessalyn Bachler, former SDSU Extension Range Field Specialist

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The Northern Great Plains offer ideal grazing conditions for both sheep and cattle. Utilizing rangelands for grazing will help reduce the largest cost to any operation - feed. Feed costs can be reduced by approximately ⅔ when livestock are grazing. Along with the economic benefit, multispecies grazing also encourages rangeland health and ecosystem diversity.

Economic Benefits

Multispecies grazing provides several opportunities to add income to an operation. First, it increases stocking rates of pastures without causing harm to rangelands, thus increasing returns per acre. A good starting point with multispecies grazing is to equate one sheep per one cow on rangeland. This means being able to sell one calf plus potentially two lambs per female off the same acreage. Second, diversifying an operation by adding another livestock species also helps mitigate risk and improve cashflow throughout the year. The natural seasonal breeding patterns of sheep cause greater seasonal price swings in the lamb market. The cattle market, however, remains relatively more consistent throughout the year (Figure 1). Additionally, feeder cattle markets tend to increase in the summer months while feeder lamb prices drop. Then, as the calf market dips in the fall, the lamb market climbs until the Easter holiday. Third, wool can also be an additional annual source of income. According to the most recent cost of production study from the American Sheep Industry (2018), the north central region of the U.S. has the highest rate of return per ewe due in part because of reduced feed costs by grazing.

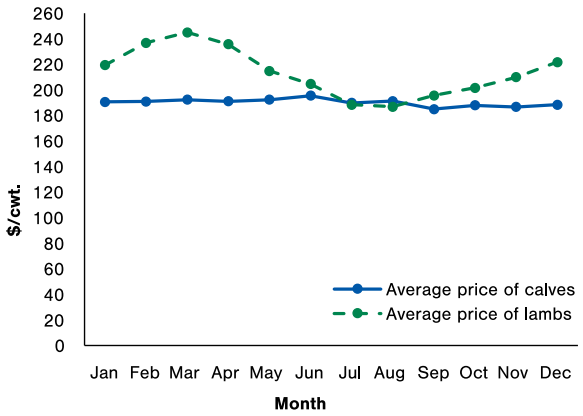

Figure 1. Monthly average price for 500 to 600 lb. calves and 50 to 60 lb. lambs (2012-2021; LMIC, 2022).

The overhead cost (buying ewes and potentially fencing) and the additional labor requirements of a flock often deters producers from integrating sheep. Although variable costs may change and differ greatly between operations, adding another livestock species decreases your fixed cost per animal unit. Additionally, with twin born lambs and wool, ewes should be able to cover the cost of purchase within the first year. That margin is slightly tighter because of the rising value of both open and bred ewes. However, adding a flock of sheep to your cattle operation has benefits beyond the economics.

Rangeland Benefits: Increased Forage Utilization and Grazing Distribution

Sheep bring a unique grazing aspect to rangelands as they graze different forages than what cattle already consume. For example, if a pasture has been long-term

grazed by cattle, it will likely have a higher percentage of woody and forb plant species than normal because cattle generally select for grasses when grazing. If a sheep flock uses that pasture, there will be a higher utilization of all plant species on the operation because sheep consume more woody and forb species than cattle do. This allows for more uniform forage utilization across pastures. For many operations that have a high percentage of woody or forb species throughout their pastures (such as common buckbrush or sage species), forage utilization can be increased twofold with the addition of a flock.

Not only will sheep increase forage utilization on rangelands, but they will also increase grazing utilization of individual pastures. Sheep can climb and navigate rough terrain to graze hillsides and steep areas that often go ungrazed by cattle. Flocks will also travel farther from water to find forage, utilizing forage in more remote areas of the pasture. Essentially, more uniform grazing distribution will be achieved by adding a flock to a grazing operation.

Expanding the utilization of forage species across a higher percentage of your rangeland increases the overall return of individual pastures. One animal unit month (AUM) is one 1,000 lb cow with a young calf at side, and the sheep equivalent is 5 ewe/lamb pairs. Therefore, you may graze 400 cows on a pasture. If that pasture is largely composed of forb and woody plant species, up to 2,000 ewes (1 cow to 5 ewes) could potentially be added to graze the unutilized forage. Increasing the stocking rate and having income from both species on the same amount of rangeland boosts revenue per acre. Note, this is largely dependent on forage availability and type, along with plant diversity. If pastures have a high presence of forb or woody species, it is recommended to slowly add sheep to the operation, starting with 1 ewe for every 1 cow to ensure adequate forage is available for both species.

Rangeland Benefits: Increased Diversity through Targeted Grazing

With increased forage utilization, multispecies grazing will naturally promote rangeland diversity. Rangelands benefit from having more than one species of grazing animal due to the instinctive selection of each species for certain types of palatable plants. To further increase diversity on rangelands, sheep offer an opportunity to target graze specific plants, such as undesirable weed species like leafy spurge, Canada thistle, or spotted knapweed. An increase in native plant diversity on rangelands promotes the functioning of key ecosystem services such as nutrient and water cycling.

Targeted grazing of weedy plant species on rangelands should be done early in the grazing season to prevent the weeds from going to seed and reproducing. When sheep are trained to target graze undesirable weedy species in spring, desirable native plant species are allowed to establish and grow throughout the summer. Weeds are generally the most palatable and nutritious in spring when they have new growth. A goal of 80% or more grazing utilization should be obtained to ensure the weeds are controlled. If weed regrowth occurs again later in the spring or summer, a second grazing period may be necessary to provide adequate control.

Although sheep will consume invasive weedy plants, they often must be trained to do so to prevent them from grazing the desirable plants that are also in the pasture. Sheep traditionally consume more forb and woody species than cattle; however, they will graze some grass and other plant species that cattle also select for. Sheep and cattle diets typically have 60% overlap (Figure 2), thus likely requiring intensive targeted grazing management of the flock with herding or temporary fencing such as polywire or electronet. Sheep that have been encouraged to graze undesirable plants such as spotted knapweed or leafy spurge are more likely to regularly consume them. Therefore, highly managed targeted grazing systems could be reduced through subsequent grazing seasons with the same flock. While this method can help decrease costs that come with spraying weeds such as equipment, chemicals, and fuel, some spraying may be necessary to ensure invasive plant control in pastures.

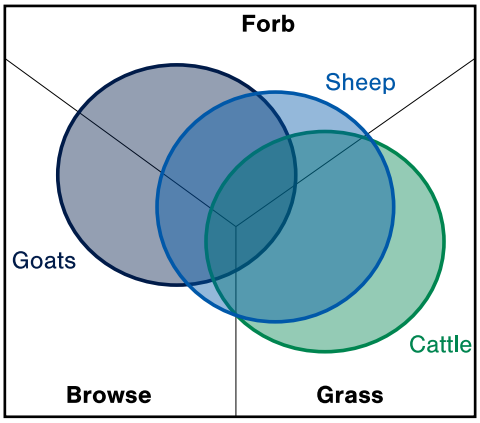

Figure 2. Diagram representing the dietary overlap of ruminant livestock (adapted from the ASI Sheep Production Handbook. 2015).

Getting Started with Multispecies Grazing

While multispecies grazing can improve biodiversity and forage production on rangelands, pastures need to be able to support both species from the start. Before expanding an operation with another livestock species, available grazing forage inventories and plant species composition should be accounted for throughout the year to ensure adequate forage will be able for both species. If enough forage is available (and enough residue is left behind to account for rangeland health), ewes should be added at a 1:1 cow to ewe rate to begin multispecies grazing. Given the dietary overlap of cattle and sheep, if rangelands are low in forb or brush species composition, sheep will graze what is available. This likely will cause overgrazing to occur because both species are consuming grasses. Overgrazing will decrease palatable plants and forage production for the nest season, and likely require rest or destocking.

After the first multispecies grazing season is complete, forage production and plant species composition should be re-evaluated before the next grazing season. Some questions to consider include:

- **Did adding a flock benefit the ranch economics as well as the rangeland?**
- **Was there enough forage available for both livestock species to coexist, without overgrazing?**
  - If not, consider destocking before the next grazing season.
- **Did the flock target graze the intended plant species?**
  - If not, what management is needed to encourage the sheep to graze them (i.e., herding, polywire)?
- **What unforeseen challenges came with adding a flock?**

After these questions have been evaluated, adjust the multispecies grazing plan for the next season.

Summary

Reaping the rangeland benefits of multispecies grazing starts with taking inventory of the available forage and establishing appropriate goals for each pasture. Whether a producer is trying to remove undesirable plant species or increase ecosystem biodiversity, adding sheep to a grazing system can promote rangeland health and increase stocking rates. Multispecies grazing promotes the sustainability of livestock production and high-quality rangelands while supporting a positive economic outlook for a given operation.

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