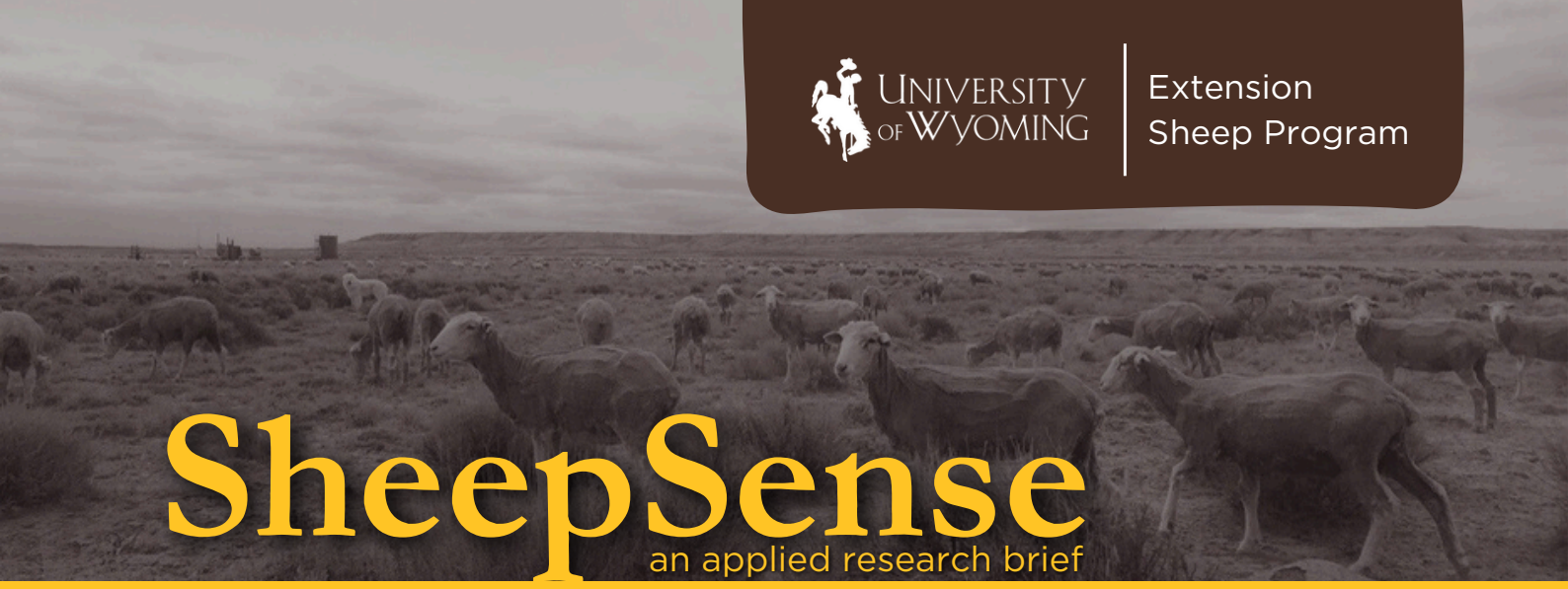

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SheepSense

an applied research brief

Understanding Winter Range Nutrient Composition to Guide Supplementation Decisions in the Wyoming Ewe Herd

Summary

Grazing rangelands throughout the winter months as a cost-effective method of providing winter feed to the ewe herd is a crucial component of many Wyoming sheep operations. Wyoming's rangelands, covering about 85% of the state, host diverse forage and browse species that vary by region. Surveys show 73% of range herds use winter range for 90-103 days annually. As imoportant as these rangelands are, much of this available feed is highly variable in quantity and overall nutrient composition. For most operations, the window between breeding and lambing coincides with the lowest quality and quantity of range forages available to the herd. Whether on sagebrush steppe or shortgrass prairie, winter range alone is often not enough to meet the requirements of late gestation and early lactation. By understanding the composition and availability of winter forage, producers can formulate an efficient and economical supplement program.

Understanding Nutrient Composition of Winter Range

As plants mature, protein in forages and digestibility decline. Once crude protein drops below 7%, rumen microbes slow, reducing intake and performance. Understanding the specific nutrient composition of a range is essential for designing an effective supplementation plan. While table 1 provides average nutrient values for common Wyoming grasses, these estimates vary widely; forage testing offers a more accurate assessment to guide supplementation decisions

LOOKING FOR MORE INFORMATION?

- Winter Ewe Management
- Evaluating Distiller's Grains
- Nutritional Flushing on the Range

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Plant Composition of Winter Range

Winter rangelands in Wyoming support diverse forage species. Cool-season grasses are generally higher quality than warm-season types, but forbs and shrubs play a key role in balancing diets when grass quality declines. The ratio of monocots (grasses, sedges) to dicots (forbs, shrubs) can determine diet quality. Research from the University of Wyoming have shown that dicot-dominated ranges—rich in sagebrush, rabbitbrush, and winterfat—offer more available protein and minerals, allowing sheep to better meet nutrient needs through selective grazing and often reducing supplementation requirements than those dominated by grasses and sedges.

Estimating Forage Availability

To determine whether supplementation or substitution is needed, ranchers must first assess expected forage availability. As sheep graze through winter, both forage quantity and quality decline. Estimating available forage in each pasture helps plan grazing duration, stocking rate, and when to begin substitution. Various tools are available to predict forage supply throughout the year and guide these decisions.

- UW Stocking Tools: ranchtools/stocking-tool
- NRCS Web Soil Survey: websoilsurvey.nrcs.usda.gov
- Rangeland Analysis Platform: rangelands.app

Example:

- A 640-acre pasture producing 1,200 lb/acre supports ~180 grazing days for 500 170 lb. ewes.
- At 500 lb/acre (drought), only ~75 days — requiring supplemental feed or reduced stocking over winter.

Good Year	1,200 lb/acre	~180 days
Drought Year	500 lb/acre	~75 days

Supplementation vs. Substitution

Whether to **supplement** or **substitute** depends on forage availability. **Supplementation** provides specific missing nutrients—such as protein, energy, or minerals—when forage quantity is adequate, but quality is low. This can include sources like alfalfa hay, grain, or mineral blocks. **Substitution**, by contrast, is needed when total forage supply is insufficient or inaccessible due to overgrazing, drought, or snow cover. In this case, harvested forage or concentrates replace the missing dry matter to meet the animals' nutritional needs.

When to Supplement

Once the availability and nutrient quality of winter range land is understood, supplementation/substitution needs can be tailored around the changing requirements of the ewe herd throughout the winter, to economically address shortfalls in available grazing. Dormant forage (4-6% CP, 45-55% TDN) often won't meet gestation or lactation needs.

Stage of Production	Crude Protein (Lbs./day) required	TDN (Lbs./day) required
Early Gestation (Twins)	0.28-0.36	1.8-2.3
Late Gestation (Twins)	0.38-0.51	2.4-3.1
Early Lactation	0.62-0.74	2.7-3.4
Adapted from Nutrient Requirements of Sheep		

Example:

- If a 165 lb. ewe eats ~2.5% of her bodyweight in forage dry matter per day, total DM forage intake is 4.13 lbs. (165 lbs x 2.5%)
- If forage is only 6% CP, then 4.13 lbs. forage = 0.25 lbs. of CP/day (4.13 x 6%), which is below the required protein intake at all stages of production.
- *Remember, is CP drops below 7%, protein supplementation is required to maintain rumen function.*

What to Supplement

Protein

Protein is the most common winter deficiency and essential for rumen function. Ewes supplemented with 0.25–0.33 lb./day of protein weaned lambs 5–10 lb. heavier than unsupplemented ewes.
Sources: Alfalfa hay, DDGS, soybean meal, pulse by-products.
By-product meals provide more undegradable intake protein (UIP), improving digestion and aiding recovery and milk production in ewes with multiples.

Energy

Measured as Total Digestible Nutrients (TDN), energy becomes limiting when forage digestibility declines or during late gestation and lactation. Feeding 0.25–0.5% of body weight in high-energy concentrate increases forage intake, improves colostrum production, reduces pregnancy toxemia risk, and supports lamb performance.
Sources: Corn, barley, oats, cereal grains

Minerals

Dormant grasses are low in phosphorus, calcium, and other macro-minerals. While shrubs and forbs help, supplementation is often required. Mineral levels also vary, with key macro-minerals like calcium, phosphorus, and potassium often deficient. Even in diverse plant communities, many Wyoming operations fall short - 42% of ranches do not provide adequate mineral supplementation.
Options: Fortified pellets or cake combining nutrients, custom mineral mixes ($10 - $25/ton), or mineral tubs/blocks for extensive systems.

DID YOU KNOW?

- Protein supplementation of 0.25–0.33 lb/day can result in 5–10 lb heavier lambs at weaning.
- Shrubs and forbs are critical winter nutrient sources, especially for protein and minerals.

Cost Effective Supplementation

A well-informed supplementation plan depends on knowing both the nutrient composition of winter range and the nutrient requirements of the ewe flock. Using range monitoring tools, forage testing, and targeted supplements allows Wyoming sheep producers to maintain production efficiency while minimizing feed costs and preserving valuable winter range resources.

Always compare feeds by cost per pound of nutrient, not by price/ton.

Table 3: Cost per pound of common supplemental feeds

Feed	Crude Protein (%)	Cost per lb. CP
Alfalfa Hay	16	$0.58
DDGS	29	$0.29
Whole Corn	9	$0.76

QUICK FACTS: SUPPLEMENTING ON WINTER RANGE

- A ewe's protein requirement nearly doubles from early gestation to early lactation, making supplementation timing crucial.
- Dormant winter grasses can drop low enough in protein that rumen microbes begin to shut down, reducing forage intake even when forage is available.
- Supplementation and substitution are not the same, supplementation fills nutrient gaps, while substitution replaces forage when supply is too low.

Table 1: Seasonal Forage Value of Common Range Grasses				
	Spring	**Summer**	**Fall**	**Winter**
Warm Season				
Big Bluestem	Good	Good	Fair	Poor
Little Bluestem	Fair	Good	Poor	Fair
Blue Grama	Good	Excellent	Good	Good
Sideoats Grama	Good	Excellent	Good	Fair
Cool Season				
Smooth Brome	Excellent	Fair	Good	Fair
Green Needlegrass	Excellent	Good	Good	Fair
Crested Wheatgrass	Excellent	Fair	Good	Poor
Western Wheatgrass	Good	Good	Good	Fair
Adapted from Sedivec et al. 2008-2009				

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