



Calculating Cost per Nutrient of Supplemental Feeds for Beef Cattle

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Understanding Costs and Convenience

Feed and supplemental forage costs are commonly the largest expense in beef operations, often comprising 60%-70% of total input costs annually. Evaluating supplemental feed and/or forage on a cost-per-nutrient basis may help producers select the most economical options for their herd. It is important, however, to understand that cost is not always the sole deciding factor in which type of supplemental feed to utilize in an operation. With many beef cattle producers having off-farm jobs, the ability to distribute feed and the convenience of supplemental feed types often (and rightfully should) play a role in determining which feed(s) will be offered. While it is difficult to place a reasonable price on convenience, producers must still prioritize ensuring that their cattle are receiving the nutrients necessary to maintain their body condition and productivity.

Calculating Cost of a Nutrient

It is simple to compare the price of feed per pound or per ton. Producers may overlook the cost of dry matter or cost of a nutrient within a feed, though. All feed and forages contain both moisture and dry matter. Dry matter (DM) is, therefore, the portion of a feed that does not contain moisture but does contain the remaining nutrients such as protein, fat, minerals and vitamins. Calculating the amount or percent of DM in a feed is important for accurate nutrient balancing and knowing the true value of a feed.

Calculating the Cost of Dry Matter in Feed

Below are the steps to take in determining the cost of DM of supplemental feed or forage. If calculating this for supplemental forages, you need to know the actual weight of the hay bales or forage being fed.

For this example, a single cooked feed tub costs \$105, weighs 225 pounds and has a 5% moisture content.

1. Find the dry feed content.
 - a. $100 - \text{moisture content} = \% \text{ DM}$
 - b. $100 - 5 = 95\% \text{ DM}$
2. Determine how many pounds of dry matter are in the feed (tub).
 - a. $\text{Pounds of feed} \times (\% \text{ DM} \div 100) = \text{pounds DM}$
 - b. $225 \text{ pounds} \times (95 \div 100) = 225 \times 0.95 = 214 \text{ pounds DM in the tub}$
3. To compare different feeds to each other, you will want to convert all feeds to a per ton basis. For this example:

- a. $(\text{feed price} \div \text{dry feed}) \times \text{pounds in a ton} = \$/\text{ton dry feed equivalent}$
- b. $(\$105 \div 214 \text{ lbs.}) \times 2,000 \text{ pounds} = 0.49 \times 2,000 \text{ pounds} = \$981 \text{ per ton dry feed equivalent}$

Calculating the Cost per Nutrient in a Feed

This can be taken a step further to calculate the cost of a specific nutrient or component of the feed. If protein (crude protein; CP) needs to be supplemented, for example, a producer may wish to know how much they are paying per pound of CP. The equation works for assessing any nutrient or component of the feed, including determining cost of energy or total digestible nutrients (TDN).

For this example, a ton of cotton seed meal (CSM) costs \$335 and contains 44% CP.

1. Determine the pounds of nutrient per ton.
 - a. $\% \text{ nutrient} \times 2,000 \text{ pounds in a ton} = \text{pounds nutrient per ton}$
 - b. $0.44 \times 2,000 \text{ pounds} = 880 \text{ pounds crude protein in a ton of CSM}$
2. Calculate cost per pound of the nutrient.
 - a. $(\text{Price per ton of the feed}) \div (\text{pounds of the nutrient per ton}) = \text{cost/pound of nutrient}$
 - b. $\$335 \text{ per ton of feed} \div 880 \text{ pounds CP} = \$0.38 \text{ per pound CP}$

Additionally, producers should keep in mind that comparisons are most accurate when looking at ingredients or specific nutrients within the same category. In practice, that means comparing high-protein feeds with other high-protein feeds, high-energy feeds with

high-energy feeds, hay with hay, etc. The cost per nutrient should be used as a tool to guide decisions, not as the only decision-making factor.

Comparing Benefits and Disadvantages of Feed Types

There are numerous benefits and disadvantages to the varying types of supplemental feed available to beef cattle producers. It is important to remember that cost is not the only deciding factor in which supplemental feed should be used. Availability of the feedstuff, farm infrastructure and when the feed can be distributed to cattle are some important considerations producers

should include when determining what supplemental feed to utilize on their operation. This may also fluctuate from year-to-year depending on feed availability, costs and producer schedules. Table 1 discusses a few benefits and disadvantages of some core feed types.

Table 1. Benefits and disadvantages of different supplemental feed types.

Feed Type	Benefits	Disadvantages	Notes
Bulk commodities (i.e., corn, cottonseed meal, etc.)	- Typically, lowest cost per pound of nutrient - Flexible for custom mixes - Reduced packaging waste	- Requires storage/equipment - Account for transportation costs and feasibility on site - Storage losses and shrink may be higher	Often best value on a nutrient basis when logistics allow
Bagged feeds (50 pounds)	- High convenience - Minimal infrastructure needed - Widely available	- Higher cost per nutrient than bulk - More labor/handling than bulk - Increased packaging waste	Useful for small herds or limited equipment
Liquid feeds	- Self-fed - Low daily labor - Easy to deploy in pastures	- Higher cost per nutrient - Ingredient limitations (reliance on urea) - Variable intake	- Keep lick tanks from running dry - Pair urea with fermentable energy
Cooked/pressed lick tubs	- Very convenient and low labor - Self-limiting intake (intended)	- Often very high DM-basis cost - Intake variability - Moisture varies widely	- Confirm DM percentage with the manufacturer - DM pricing essential

Summary and Practical Guidance

Supporting the nutritional needs of a beef herd requires informed, intentional decisions that fit the unique goals, resources and management styles of every operation. Regardless of herd size, experience level or available equipment, all producers benefit from selecting supplements based on accurate nutrient information and fair comparisons across feed types. Evaluating cost per unit of nutrient — particularly crude protein (CP) and total digestible nutrients (TDN) — creates a clearer, more equitable basis for choosing the most efficient and affordable feeding strategies for your cattle. These practices help ensure sustainable production while promoting animal well-being, resource stewardship and long-term viability for diverse agricultural communities.

To support inclusive and well-informed decision-making, producers are encouraged to adopt the following best practices:

- Obtain a forage and feed analysis for accurate CP and/or TDN and DM values. This ensures every producer

(regardless of operation size) can compare supplements using real, operation-specific data, creating a fairer and more reliable foundation for ration decisions.

- Use DM-basis pricing when comparing liquids and tubs to dry feeds. This allows different supplement types to be compared on equal footing, especially important for those using self-fed systems or purchasing smaller quantities.
- If using nonprotein nitrogen (urea), ensure adequate fermentable energy and avoid over-consumption events. Producers with varying levels of experience can confidently use these products when guided by safe, evidence-based practices.
- Refill lick tanks before they run dry to prevent rapid over-consumption when refilled. This simple management step helps safeguard cattle health and reduces the risk of nutrient overload, making supplementation safer and more predictable for all operations.

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By combining accurate nutrient analysis, fair cost comparisons and safe supplementation practices, producers can make feeding decisions that enhance efficiency, protect cattle health and support the long-term resilience of their herds. These principles empower

every producer — regardless of scale, background or resources — to build a nutrition program that is both economically sound and well-aligned with the needs of their cattle and their community.

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