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Beef Ration Rules of Thumb

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This factsheet can both guide producers through a feed test and help them understand the results.

With a feed test in front of you, look at the following rules and compare them to the feed test. Remember, these are rules of thumb, which means they hold true most of the time, but variations in management and cow type will affect the end result.

These rules of thumb should not be considered a replacement for balancing rations with proven software, but rather an aid to understand the feed and where it fits in the management.

Rules of Thumb

Dry matter

Always refer to the "**dry matter**" numbers. These numbers have the moisture factored out and allow the comparison of all feeds, from silage to grains.

Crude protein

Protein is a building block. The **Beef Cow Rule of Thumb** with protein is **7-9-11**, which means an average mature beef cow requires a ration with crude protein of 7 per cent in mid pregnancy, 9 per cent in late pregnancy and 11 per cent after calving. The method to monitor protein in terms of cow performance is to look at the manure - high levels of undigested fibre in the manure indicate low protein.

Crude protein with feeder calves

The **Feeder Calf Rule of Thumb** is **14-12-10**. A feeder calf from 550 to 800 lbs needs a ration of 14 per cent protein, from 800 to 1,050 lbs needs 12 per cent protein and from 1,050 lbs to finish needs 10 per cent protein. An implant program will create variations to this rule, so check with the implant manufacturer.

Energy

Energy gives the ability to use the building blocks for growth and other productive purposes. Learn one of the six measures for energy and stick with it. Using Total Digestible Nutrients (TDN) per cent, the **Rule of Thumb** is **55-60-65**. This rule says that for a mature beef cow to

maintain her body condition score (BCS) through the winter, the ration must have a TDN energy reading of 55 per cent in mid pregnancy, 60 per cent in late pregnancy and 65 per cent after calving.

Energy can be monitored in the beef cow by watching BCS; low energy rations result in a loss of BCS. Other energy units of measure include Digestible Energy (DE), Metabolizable Energy (ME), Net Energy for lactation (NEL), Net Energy for maintenance (NE_m), and Net Energy for gain (NE_g), and producers can develop their own rules for these measures if the need arises.

Calcium to phosphorous ratio

The **calcium to phosphorous ratio (Ca:P)** for a mature beef cow should be within the range of **2:1 and 7:1**, assuming actual required grams of each are adequate. Using a feed test, the ratio is calculated by dividing the dry matter Ca (%) by the dry matter P (%). Ratios outside this range need to be addressed using feed blends or commercial minerals.

Minerals

On an average feed analysis sheet, two other related minerals are reported: magnesium (Mg) and potassium (K). These two minerals, in combination with calcium (Ca), make up the tetany ratio, which is $K/(Mg + Ca)$. Cowbytes, which is a ration balancing software program available through Alberta Agriculture, Food and Rural Development, indicates that this ratio should not exceed 2.2:1.

The combination of high K (**Rule of Thumb - over 1.75%**), and/or low Ca (**Rule of Thumb - under 0.6%**) and low Mg (**Rule of Thumb - under 0.3%**) can lead to animal performance issues. Because this ratio involves three different numbers, producers are encouraged to look at the three figures both individually and as a ratio to determine if the need for caution exists.

With respect to commercial minerals, an average **25 kg bag of minerals will last about 1 week for 50 cows**. Read the label for specific feeding rates.

Salt

On many feed analysis sheets, only Sodium (Na) is reported. **Rule of Thumb** says that **Na x 2.5 equals NaCl (salt)**.

Salt Rule of Thumb: if the feed analysis shows that Na is over 0.1 per cent, which equates to salt over 0.25 per cent, livestock will receive all their salt requirements from the feed and therefore will not consume commercial minerals with added salt. High salt levels are very prevalent in cereal greenfeed and their associated feed analysis.

The Next Step

Once producers understand the quality of their individual feeds, the next step is to determine the quantity of feed required, both for individual animals per day and for the herd for the winter. Several Rules of Thumb apply to feed quantity.

Rule of Thumb for consumption

All beef cattle will consume approx 2.5 per cent dry matter (DM) of their body weight per day of average quality feed. For example, a 1,000 pound cow will eat 25 lbs of dry matter feed per day. Moisture and feed waste must be factored in on top of this number.

The following table, taken from Cowbytes, shows different consumption levels based on forage quality (Table 1).

Table 1. Forage intake guidelines [as per cent of body weight (BW)]			
	Straw and poor forage	Medium quality forage	Excellent quality forage
Growing and finishing cattle	1.00%	1.8 to 2.0%	2.5 to 3.0%
Dry mature cows and bulls	1.4 to 1.6%	1.8 to 2.0%	2.3 to 2.6%
Suckled cows	1.6 to 1.8%	2.0 to 2.4%	2.5 to 3.0%

Cold stress

Under cold stress, for every 10 degrees Celsius (C) below minus 20 degrees C, feed 3 kg of hay or 6 kg of silage or 2 kg of grain AS FED to cows.

Rule of Seven: for quick calculation purposes, this rule says that in an average operation, a combination of tons of silage, average size round bales of hay and average size round bales of straw all need to add up to **seven per mother cow**. For example, you may need three tons of silage, two bales of hay and two bales of straw per cow per winter. Cow size, length of winter-feeding season and feed wastage contribute to variations in this rule.

Backgrounding feeder calves require, as a **Rule of Thumb**, an additional 3 tons of silage or 1 ton of hay per 90 days of feeding.

Feed wastage

With respect to feed wastage, the **Rule of Thumb** says that if you see feed on the ground, you have 15 per cent waste. Many operations have over 20 per cent feed waste every winter, and the producers may not realize that this waste costs in excess of \$40/cow.

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