Calculating Intake based on Animal Demand

Animal Units (AU): In the early days of rangeland management, a system was devised to convert groups of cattle, sheep, and horses into common animal units so that herds and flocks could be easily compared in terms of how much forage they would consume. The standard unit created was the **Animal Unit (AU)** which was designated as a 1,000-pound cow and her calf. However, many grazing animals weigh more or less than 1,000 pounds and are not ruminants, so these early rangeland managers developed the concept of the Animal Unit Equivalent (AUE) to reflect such equivalencies as 5 sheep = 1 AU or 1 horse = 1.25 AU. However, modern ranchers have scales to weigh their livestock and the idea of an Animal Unit has evolved to simply mean 1,000 pounds of grazing ruminant animal.

Animal Unit Months (AUM): To express how much forage is on the land, a concept called an **Animal Unit Month (AUM)** is used based on the amount of forage that an animal unit will eat in a month. A large grazing ruminant animal, like cows or bison, eats about 2.5% of their body weight each day while foraging on rangeland. Therefore, a 1,000 lbs ruminant (i.e., an AU) would eat 25 pounds/day (i.e., 1,000-pound animal × 2.5% = 25 pounds) and in a month an AU would eat 750 pounds (i.e., 25 pounds/day for 30 days in a month). Therefore, an **AUM = 750 pounds** of dry forage.

Animal Forage Consumption: The amount a grazing animal eats depends on forage quality, physiological state of the animal, climatic conditions, and many other factors. However, in the CDE we will focus on two important factors: 1) the size of the animals, and 2) whether the animal is a ruminant (i.e., cow, bison, moose, elk, sheep, deer, pronghorn, etc.) or an equid (i.e., horse, donkey, or burrow).

Ruminant animals vary greatly in size from small deer to large bulls. Weight matters when figuring out how much an animal, flock, or herd will eat while grazing on a piece of land.

- Large ruminants like a beef cow or big bison or moose bull, weighing 1,000 pounds or more, would be expected to eat about 2.5% of body weight each day.
- Medium-sized ruminants weighing 500 to 1,000 pounds like growing beef steers or heifers or elk cows would eat about 3.0% of their body weight each day.
- Small ruminants like sheep, goats, pronghorn, deer, or bighorn sheep weighing 100 to 500 pounds would eat 3.5% of their body weight each day.

To determine how much a ruminant eats each day first determine their average weight and multiply their weight times 2.5% if they are a large ruminant (1,000 or more), 3.0% if a medium-sized ruminant (500-1,000 lbs), or 3.5% for a small ruminant (100-500 lbs). For example, a cow weighing 1,200 pounds would eat 30 lbs/day, a bull elk weighing 700 pounds would eat 21 lbs/day, and a domestic sheep that weighs 200 pounds would eat 7 lbs/day.

Equids are a group of animals that include horses, donkeys, and burrows. Equids do not have a rumen, but they can eat rangeland grasses and forbs because their digestive system is adapted for grazing. The digestive track of equids has an enlarged cecum/colon which houses microbes and breaks down cellulose just like a rumen. This so called “hindgut” fermentation system works like a rumen, but it is less efficient, so equids eat about 25% more than ruminants on an average day. Therefore, to estimate how much a horse would eat just calculate consumption as if the horse was a ruminant, then multiply by 1.25 to estimate the greater amount the equid would eat because of its less efficient digestive system. For example, a wild horse weighing 800 pounds would eat 3% of its body weight per day (because it weighs between 500 and 1,000) or 24 lbs/day plus 25% more because it is equid or 30 lbs/day (24 × 1.25 = 30).