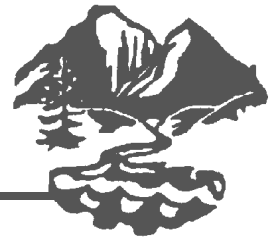




LIVESTOCK AND NATURAL RESOURCES



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A YEAR IN THE LIFE OF ANNUAL RANGE

No one knows from year to year how much growth we will have. Generally, adequate rainfall that is distributed throughout the growing season will translate to adequate forage supplies.

While we are unsure of what the future will bring, there are certain trends that we can predict with certainty regarding forage quantity and quality.

Quantity refers to the amount of growth. **Quality** refers to the energy and protein contained in the forage.

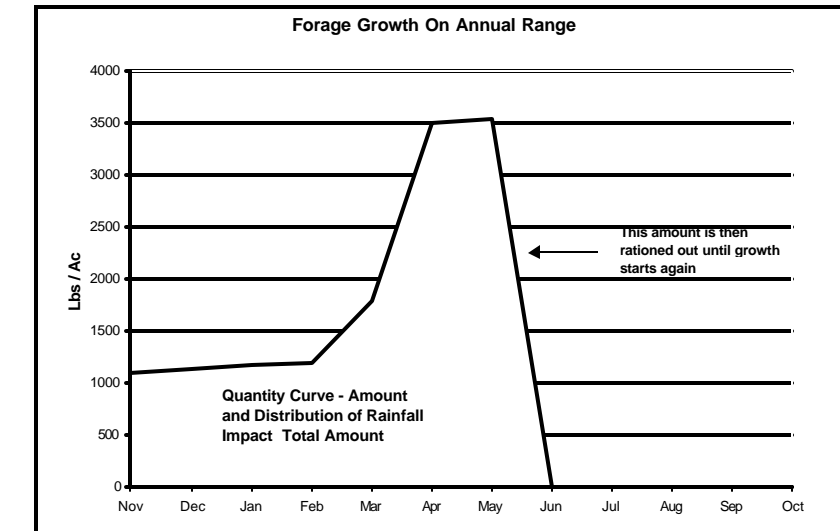
The information that follows is based on monthly forage sampling at the Sustainable Ranching research site.

Quantity

While we cannot predict how much total production we will see for the 1998-99 year, we do know when that growth will occur. Right now as this article is being written, there has been enough rainfall to germinate plants.

We currently have a mix of last year's brown residual and this year's green growth. Over the next few weeks, the brown residual will disappear into the soil leaving new green growth.

Quantity gets started in fall with greenup, slows to a near



standstill from early to mid winter (**low quantity**), and then takes off in late winter through mid spring (**high quantity**). From mid-spring to mid-fall, growth has stopped.

One challenge for people who run livestock year round on annual range is to accumulate as much feed as possible during the growing season, and then ration it out until growth starts again.

Quality

Quality has a different pattern than quantity. Quality is highest during the slow growth period of late fall-mid winter. From late winter-mid spring, quantity will start to decline. Once growth stops, quality will decline throughout the summer and fall.

What Happens To Protein?

From a high of over 20% in late winter, protein will decline to around half that by the end of the growing season in May. Protein will continue to decline throughout to the summer to less than 6% in August. By fall, protein may decline to less than 4%.

What Happens to Energy?

Energy declines slightly from March to May. By July, energy content will have declined anywhere from 33 to 40%. Energy levels seem to stay fairly consistent throughout the rest of the summer and fall. Once fall green-up occurs, energy and

protein levels start to increase.

Implications

During winter, feed quality is excellent. The lack of quantity poses a problem if animal demand is high — for example, a lactating cow. If the cow loses too much weight, you may have trouble getting her bred. Substitution feeding (*to make up for the lack of quantity*) will be needed to keep the cow in adequate condition to re-breed.

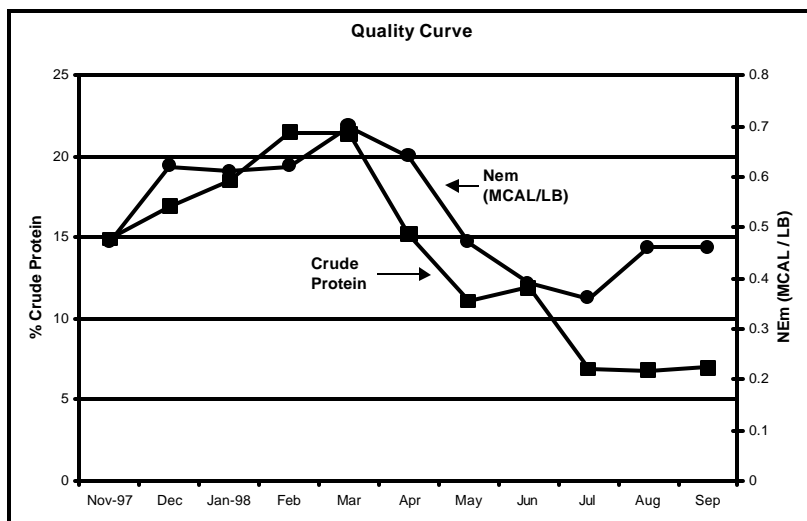
During spring, quality starts to decline as quantity reaches its highest level. By the onset of seed formation, growth has peaked for the year. The amount of that peak will depend on rainfall amount and distribution along with the effectiveness of the water cycle on your land.

Quality will continue to decline over the next few months. The biggest concern for the rancher is the protein decline.

The annual range forage is primarily cellulose. We can't digest cellulose and neither can the cow. Luckily, the cow has a fermentation vat called the rumen that houses microbes. Microbes can break down the cellulose and re-form the energy and protein volatile fatty acids and microbial protein. These end products are used to satisfy microbial requirements with the rest being available for the cow.

Two Kinds of Protein

Forage contains two kinds of protein, degradable and escape.



Degradable protein is fermented in the rumen, broken down, and then re-formed as microbial protein to be used by the microbes and the animal. Forage protein is approximately 80% degradable. Since the breaking down and re-forming processes are not 100% efficient, there is an adjustment of 90% to degradable protein values. The degradable protein in the forage is 72% (.80 degradable protein X .90 efficiency) of the total protein.

Escape protein makes up the other 20% of the total forage protein. This protein passes through the rumen without being broken down. This protein can be directly used by the animal.

Feed the Microbes

The drop in protein contained in the forage causes a decline in microbial numbers. They need protein to grow and multiply just like we do. If protein is inadequate and we choose not to

supplement, then the feed energy in the forage (MCAL) will not be fully utilized. Considering the high cost of supplying external energy (hay, grain, infrastructure and labor needed to feed to the cows), we simply cannot afford to let this happen.

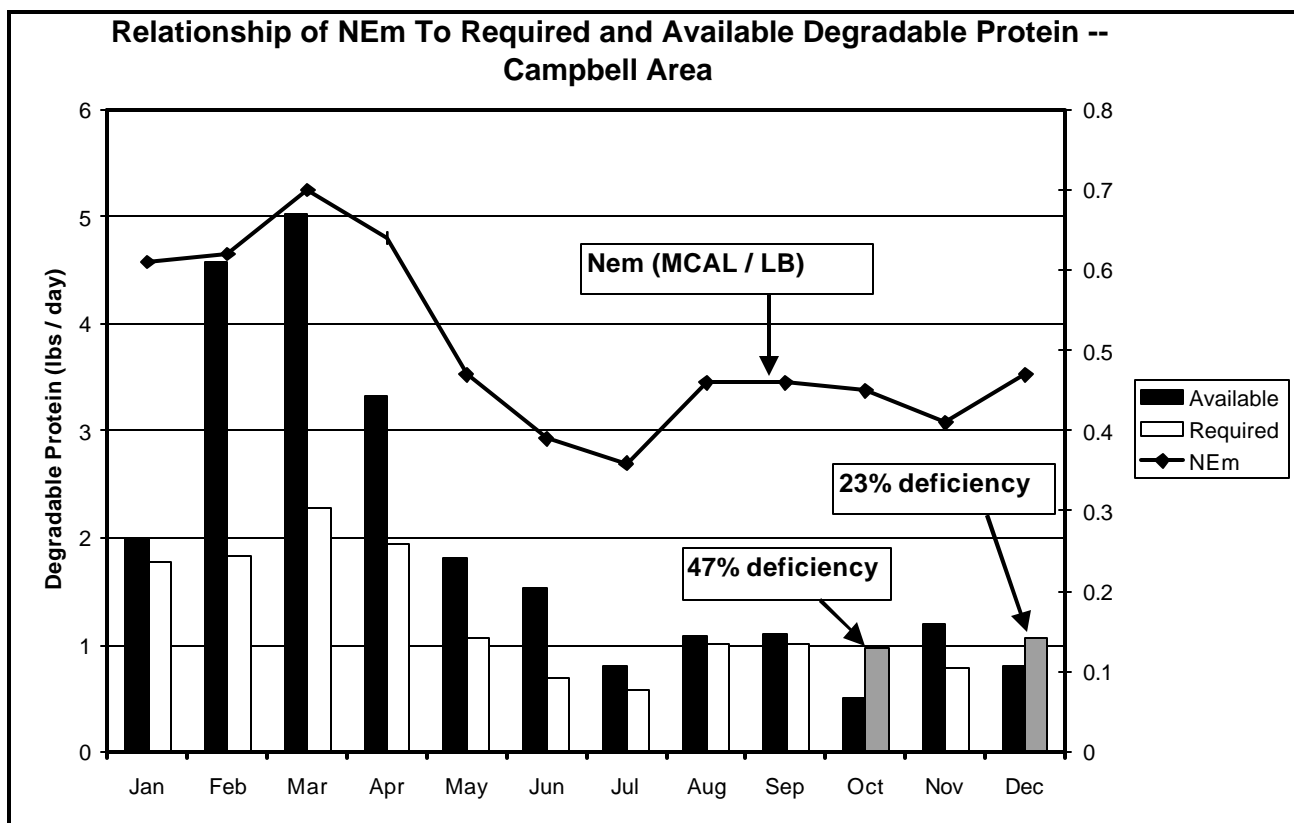
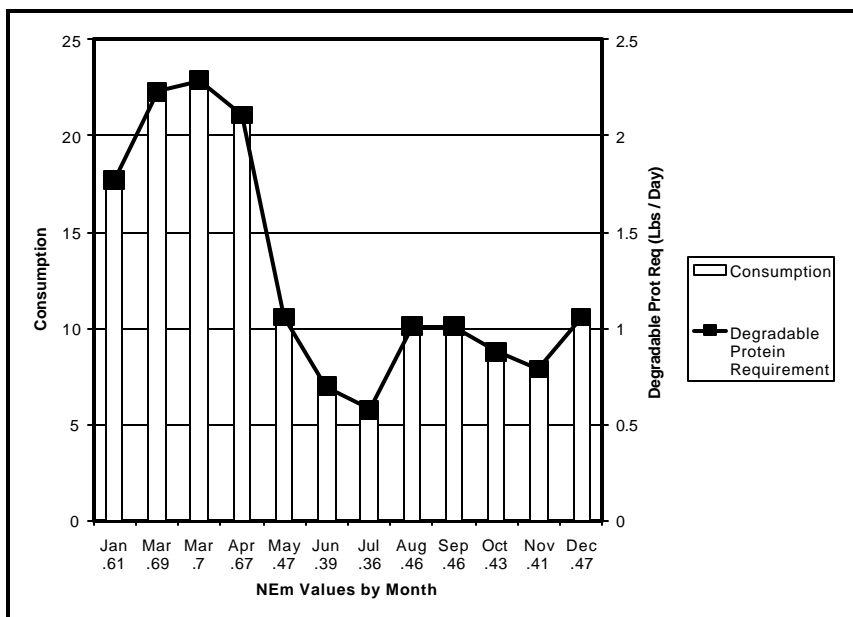
Conversely, if we choose to supplement protein, then we can fully utilize the energy in the feed. A common low cost way to provide protein is urea fed as part of an overall mix that also contains trace minerals.

Let me repeat this again — when forage protein levels drop below requirements in summer and late fall, we must feed the MICROBES protein to keep populations from declining. If microbe numbers stay stable, this enables the cow to get at all the energy contained in the forage. (See graph to right.)

The graph below illustrates our project site for the 1998 year. We did not need to supplement with protein until October. However, we have

been real close to the requirement since August. We started supplementing in late July.

For more nutrition information, see the Sustainable Ranching Web Site.



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