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Texas Agricultural Extension Service
The Texas A&M University System

Supplementing Stocker Cattle

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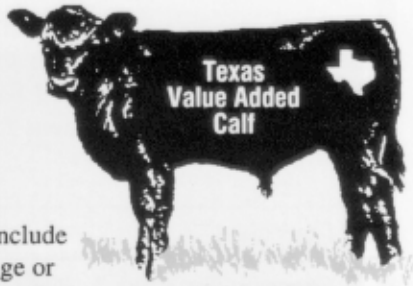

There are several reasons for supplementing stocker cattle on pasture. These include 1) improving average daily gain, 2) "stretching" forage supplies in times of limited forage or increasing stocking density when forage is adequate, and 3) providing a more balanced nutrient supply and feed additives such as ionophores and bloat preventive compounds (i.e., poloxalene). This article summarizes several supplementation strategies for summer stockers and stocker cattle on small grain pastures.

Summer Pastures

Dry weather and advancement in plant maturity during the latter half of the summer contributes to a steady decline in both quantity and quality of native summer pastures. Daily gains of cattle decline from mid-summer to early fall. Boosting cattle gains during this period is a goal of many producers. Research, as well as producer experience, has indicated a fairly simple yet successful supplementation program during the summer months for situations in which forage quantity is not limiting but quality (i.e., protein content) is poor. The program, in its simplest form, would be to provide approximately 1 lb./head/day of an all natural 38% protein range cube such as soybean meal or cottonseed meal containing 100 mg. (Rumensin) to 200 mg. (Bovatec) of an ionophore. Ionophores are growth promotants that increase efficiency of feed utilization by cattle. This program can increase daily gains by as much as .6 lb./head/day and the range cubes can be fed directly on the ground. With the addition of an implant, gains can be increased by another 10 to 15%.

Cattlemen sometimes wish to feed more than 1lb/day of supplement or may need to feed cattle on forages that are higher in protein than summer native range (eg., fertilized Bermudagrass pastures). Extension personnel are recommending adding about 1.5 lb of wheat middlings to a 38% protein supplement to form a 25% range cube. Specifically, the range cube contains: 25% crude protein (min., all natural), 0.7% phosphorous (min.), 1.0% calcium (max.), up to 20,000 IU supplemental vitamin A per day when needed (probably not needed in summer), and 100 grams/ton of Rumensin or Bovatec or 280 grams/ton of chlortetracycline. When this cube is fed at 2.5 lb/day, cattle are being provided 125 mg/day of Rumensin or Bovatec or 350 mg/day of chlortetracycline. Other situations where feeding the 25% protein supplement may be appropriate are 1) early intensive grazing of light-weight cattle on native range up to about July 15 and 2) heifer development programs when accelerated gains are necessary to achieve proper breeding rates.

These high-protein supplements can be modified to meet specific mineral and vitamin requirements of the cattle. For example, a producer may wish to incorporate additional salt, vitamins (A, D, and E), potassium, phosphorous, calcium, magnesium and trace minerals. Trace minerals, especially copper, zinc and selenium, can greatly affect the immune response of cattle. Reputable feed companies or county Extension Agents can assist in formulating a customized version of the protein supplements.

It should be noted that protein supplements stimulate intake of calves grazing low to medium quality pastures. Therefore, if forage quantity is severely limiting, higher energy supplements may be necessary to maintain daily gains.

Small Grain Pastures[2]

Both the total digestible dry matter (DM) and the crude protein content of small grain pastures are high. Wheat forage will commonly contain 75% digestible DM and 25 to 30% crude protein during the fall and early spring grazing periods. Accordingly, the digestible DM:crude protein ratio of wheat is about 3:1. Research suggests that the efficiency of nitrogen use in the rumen of cattle is hindered at ratios less than 4:1. Traditional thinking has been that supplemental energy may help increase the digestible DM:crude protein ratio in the rumen of cattle, thereby improving daily gains. University research supports this idea.

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[2]Much of the work relative to small grain pastures is based on the research conducted by the author and Dr. Gerald Horn at Oklahoma State University.

Energy Supplementation

There are two basic energy supplementation strategies to work from. The first is a "small package" energy supplement where cattle are fed at a rate of 2 lb./head/day. Milo (grain sorghum) or corn work well as the grain component of this supplement and an ionophore (Bovatec or Rumensin) can be included to improve feed utilization and possibly reduce the incidence or severity of frothy bloat. An example of this supplement is shown in Table 1.

Table 1. Composition (as-fed basis) of a "small package", energy supplement for cattle grazing wheat pasture.[a]

Ingredient	%
Ground milo	63
Wheat Middlings	21
Sugarcane molasses	5
Calcium carbonate	4.00
Dicalcium phosphate	2.54
Magnesium oxide	.75
Fine Mixing Salt[b]	4.00
Ionophore[c]	X[d]

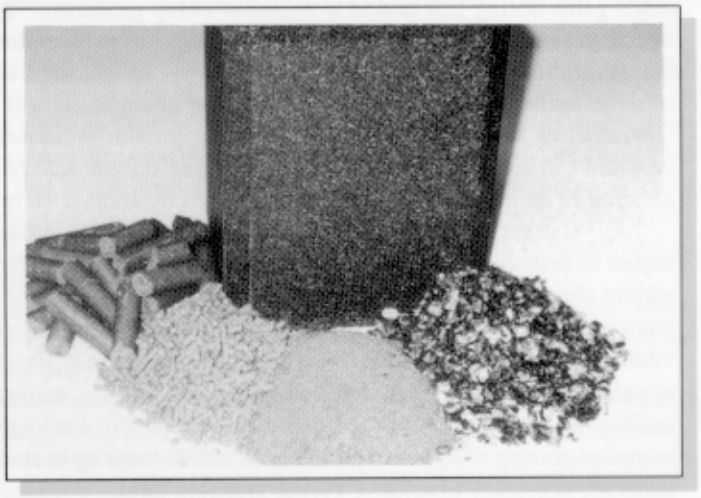
[a]Can be fed as a 3/16" pellet or in meal form.

[b]Depending on supplement intake, salt may need to be increased to 6%, at the expense of milo.

[c]Rumensin (monensin) or Bovatec (lasalocid). Salt and/or magnesium content may need to be adjusted to maintain the daily intake of Rumensin or Bovatec within the FDA approved levels as indicated in footnote d.

[d]Formulate to provide FDA approved levels of Rumensin (50 to 200 mg/head/day) or Bovatec (60 to 200 mg/head/day). Follow label directions.

This supplement has consistently improved gains of stocker cattle by .5 lb./day over non-supplemented cattle. Close management is strongly recommended to prevent over-consumption. Ionophores in large amounts can be toxic to cattle. In times of snow cover or low forage availability, hay should be available to the cattle to help prevent over-consumption. The bloat preventive compound poloxalene could be substituted for the ionophore in the energy supplement to help reduce the severity of frothy bloat.



The second strategy would be to feed a moderate amount of supplement in order to buffer large swings in forage availability and/or increase stocking rate. The target level of supplement intake is about .75% of mean body weight (or roughly 4 to 5 lb./head/day, depending on the weight of the cattle). The grain used in this supplement could be ground corn or milo or higher-fiber, by-product feeds such as soybean hulls and wheat middling. Cattle consuming a supplement consisting primarily of corn or a soybean hull/wheat middling mixture have shown similar performance on pasture. However, the soybean hull/wheat middling supplement may be preferred because these ingredients are relatively low in starch content, compared to corn or milo, and have less potential for causing lactic acidosis if over-consumption occurs. Secondly, it was observed in several years of research that the cattle tended to consume the soybean hull/wheat middling supplement more quickly (usually in one morning feeding) when it was hand-fed in bunks each day. Cattle offered the corn-based supplement usually consumed it over several feeding periods during the day. This can be important on days where precipitation could accumulate in the bunks. Additionally, the potential for contamination from bird excreta is greater for supplements remaining in the bunks for longer periods. An example of a high-fiber, 3/16" pelleted soybean hull/wheat middling supplement is summarized in Table 2.

Table 2. Composition (% as-fed) of a hand-fed, high-fiber energy supplement to be fed at a moderate level[a] to cattle grazing wheat pasture.

Ingredient	%
Soybean hulls	47
Wheat Middlings	42
Sugarcane molasses	5
Calcium carbonate	1.50
Micro-lite	4.15
Salt	.65
Ionophore[b]	X[c]

[a]Target level of consumption is .75% of mean body weight.

[c]Rumensin (monensin) or Bovatec (lasalocid). Salt and/or magnesium content may need to be adjusted to maintain the daily intake of Rumensin or Bovatec within the FDA approved levels as indicated in footnote d.

[d]Formulate to provide FDA approved levels of Rumensin (50 to 200 mg/head/day) or Bovatec (60 to 200 mg/head/day). Follow label directions.

An example of a high-starch, 3/16" corn-based supplement is summarized in Table 3. Producers should be aware that this supplement contains larger quantities of starch than the soybean hull/wheat middling supplement. **Therefore, the potential for lactic acidosis from over-consumption warrants careful management.**

In a three year study, feeding these supplements (Tables 2 or 3) allowed stocking rate to be increased by about 1/3 (i.e., from 2 to 1.5 acres/head) on wheat pasture and improved daily gains by .33 lb./head/day over non-supplemented steers. Conversion of the supplements (lb. of supplement [as-fed] per lb. of increased gain per acre) averaged about 5.

Stocking Rate Considerations

Determining the proper stocking rate for cattle on small grain pastures is a difficult task. Large variations in forage growth throughout the grazing season is typical due to weather conditions (i.e., temperature, moisture). In the western portion of Texas, general "rules of thumb" for stocking cattle on wheat are about 150 lb. of beef/acre, or more, for dryland wheat and about 400 lb of beef/acre, or more, for irrigated wheat pasture. Producers in areas of the state that receive more rainfall (30" +) often stock pastures at 2 acres/steer or roughly 250 lb of beef/acre. These figures should be used as guidelines only and producers should consider a "put and take" method of stocking pastures.

Table 3. Composition (% as-fed) of a hand-fed, corn based energy supplement to be fed at a moderate level[a] to cattle grazing wheat pasture.

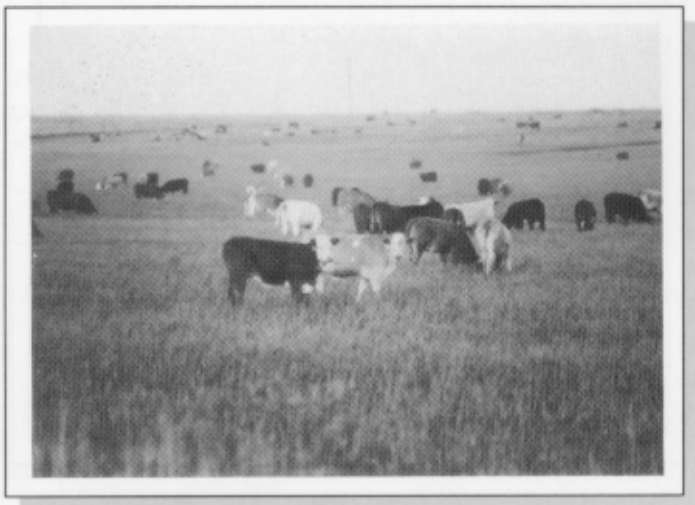
Ingredient	%
Ground corn	79
Wheat Middlings	9
Sugarcane molasses	5
Calcium carbonate	1.75
Dicalcium phosphate	.60
Micro-lite	4.15
Salt	.65
Ionophore[b]	X[c]

[a]Target level of consumption is .75% of mean body weight.

[b]Rumensin (monensin) or Bovatec (lasalocid).

[c]Formulate to provide FDA approved levels of Rumensin (50 to 200 mg/head/day) or Bovatec (60 to 200 mg/head/day). Follow label directions.

A logical question to ask is, "If energy supplement is provided how much can I increase stocking rate?" Scientists have not determined a specific answer for this question but existing research seems to support a 5-10% increase in stocking rate for each pound of supplemental energy fed per head per day. Again, this is only a guideline and should be combined with experience and common sense. Progressive stocker operators may wish to hand-clip forage samples 3-4 times during the grazing season to monitor forage availability. Recent research indicates that as dry matter forage availability falls below 20 lb/ 100 lb. of body weight/day, daily gains will decline as a result of depressed energy intake. Extension personnel can aid the rancher in interpreting this information into stocking rate decisions.



Silage and Low Quality Roughage

Corn, wheat or sorghum silage can also be good sources of supplemental energy for stocker cattle on small grain pastures. In general, feeding supplemental silage can allow stocking rate on small grain pastures to be doubled without decreasing weight gains of the cattle. Each pound of silage dry matter can be expected to decrease forage dry matter intake by about .6 lb. Field experience has shown that feeding silage with a good wheat pasture mineral mixed in helps insure proper daily mineral intake.

Low quality roughage such as wheat straw are sometimes fed free choice to stocker cattle on wheat pasture but studies have shown no real positive or negative responses to this practice. However, if cattle on small grain pastures do not have a dry place to lie down, availability of low-quality roughage may improve performance by providing bedding and aiding maintenance of normal body temperature during severe storms.

Minerals and Feed Additives

Small grain pastures are typically low in calcium and marginal in phosphorous and magnesium content for growing cattle. In the high-plains of Texas and in southwest Kansas phosphorous content will often be low in wheat forage. There is no evidence that supplemental magnesium will decrease the incidence and (or) severity of bloat of stocker cattle on small grain pastures. However, there may be a relationship between ruminal motility (and the ability of stocker cattle to eructate gases) and the calcium status of the cattle. Therefore, it is recommended that supplemental calcium be provided to the cattle (either in an energy supplement or in loose form) to help the animal meet requirements for growth and to possibly decrease the occurrence/ severity of bloat by augmenting ruminal motility. Magnesium, phosphorous, zinc and copper can also be incorporated into an energy supplement or provided free-choice in weather-vane type feeders.

Providing the feed additive poloxalene is a proven management practice that reduces the occurrence of bloat. When cattle are used to coming to bunks to consume supplement, poloxalene can easily be available to the cattle by mixing it with the feed. Poloxalene should be provided at the rate of 1-2 g/100 lb. body weight/day.

As previously mentioned, ionophores have been shown to reduce the incidence of bloat and should be considered as a feed additive. Even if the potential for frothy bloat is minimal, ionophores are cost effective because they increase feed efficiency.

Summary

The key to maximizing gains, regardless of the type of forage being grazed, is to match the nutrients provided by the forage to the requirements of the animal. Nutrients that are deficient should be provided to the animal in some form of supplement. These nutrients might include protein, energy and both macro and trace minerals. Ionophores and growth promoting implants have been proven again and again as cost effective means of increasing cattle performance. Today's cattleman cannot afford the potential loss in income from ignoring these opportunities.

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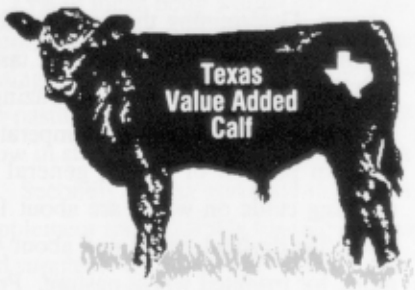

THE BOTTOM LINE ADVANTAGE

FOR PASTURE CATTLE, REPLACEMENT HEIFERS AND FEEDLOT CATTLE

Extension programs serve people of all ages regardless of socioeconomic level, race, color, sex, religion, disability or national origin.
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