NebGuide

Nebraska Extension

Research-Based Information That You Can Use

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Wintering and Backgrounding Calves

Aaron Berger, Extension Educator

Erin Laborie, Extension Educator

Karla H. Wilke, Cow-Calf, Stocker Management Specialist

Reasons to Background Calves

Growing or backgrounding weaned calves prior to entering the feedlot for finishing may be done for a variety of reasons.

1. To capture value from additional weight gain on the animal and market later in a historically more favorable market season.
2. To add value to cattle through completion of the weaning process and veterinarian recommended vaccination schedules including post-weaning booster shots.
3. To utilize economically available co-products, forages, and crop residues.
4. To hold/prepare the cattle for a spring/summer grazing program.
5. To develop replacement heifers.

There are a number of different methods for backgrounding or growing calves after weaning. The method which best meets a producer's goals will depend upon a number of factors, including cattle genetics, cattle weight, available feed resources, facilities, future grazing plans, and timing of marketing to name a few.

Nutritional Considerations of Steers and Heifers

Nutrition is a key factor in the success of a backgrounding program. Once a desired rate of gain has been determined, the diet must be balanced to provide the nutrients necessary to achieve that gain. Growing calves have a requirement for metabolizable protein (MP): a combination of rumen microbes and rumen undegradable protein (RUP) which is protein available at the tissue level for muscle and structural growth. If too much energy is fed and MP is limiting, calves will get fat without the desired structural growth. Achieving the intended gain is critically important to the success of the backgrounding program. Depending on the goal of the program, both calves that gain too little and those that gain too much can affect market time and possibly reduce the profitability of the backgrounding program. The following chart will help producers determine the nutrient needs for calves to achieve various rates of gain, keeping in mind that the MP requirement must be met. A 500 lb calf would need 240 g/d MP for maintenance up to 795 g/d to gain 3.5 lb/d, while a 700 lb calf would need 300 g/d for maintenance and only 775 g/d to gain 3.5 lb/d because the younger calf has a higher requirement for structural growth. Producers should feel free to contact extension personnel for ration balancing assistance.

Converting Dry Matter Intake to As Fed Intake

Dry matter intake must be converted to an "as fed" basis before the actual amount of feed necessary can be determined. Dry matter intake is a calculation that removes all moisture from the feed to create an equal comparison

Dietary Requirements for 500 lb medium frame steers

Daily Gain, lb/d	Dry matter Intake (lb/d)	Crude Protein (%)	NEg (Mcal/lb)	TDN (%)	Ca (%)	P (%)
0.5	11.5	8.5	0.25	54.0	0.25	0.17
1.0	12.3	9.5	0.31	58.5	0.32	0.20
1.5	12.8	10.5	0.38	63.0	0.40	0.22
2.0	13.1	11.4	0.44	67.5	0.47	0.24
2.5	13.0	12.5	0.51	73.5	0.56	0.27
3.0	11.8	14.4	0.64	85.0	0.69	0.32

Dietary Requirements for 700 lb medium frame steers

Daily Gain, lb/d	Dry matter Intake (lb/d)	Crude Protein (%)	NEg (Mcal/lb)	TDN (%)	Ca (%)	P (%)
0.5	14.8	7.9	0.25	54.0	0.22	0.18
1.0	15.8	8.6	0.31	58.5	0.27	0.18
1.5	16.5	9.2	0.38	63.0	0.31	0.20
2.0	16.8	9.8	0.44	67.5	0.34	0.21
2.5	16.7	10.5	0.51	73.5	0.40	0.22
3.0	15.2	11.7	0.64	85.0	0.49	0.26

Charts adapted from the NRC 2016

across ingredients. However, to determine the amount to feed, the moisture in the feed must be accounted for. For example, if 12.8 lb of dry matter were required, and meadow hay was the feed source and the meadow hay contained 11% moisture (89% dry matter) then 14.4 lb of actual hay would be fed (12.8/.89). On the other hand, if a producer wanted to supplement with 2.5 lb of wet distillers grains (dry matter basis), then 7.1 lb of actual feed would be fed (2.5/.35) because the dry matter of wet distillers grains is only 35%.

Determining the Amount of Gain to Target

Historically, many producers have targeted less than 1 lb/d winter rate of gain for spring born, fall weaned calves. The logic behind this was that calves will experience compensatory gain (or gain at a much faster rate of gain and make up the low rate of gain) once they have access to a higher plane of nutrition such as grazing summer grass. While this phenomenon is real, data would suggest that calves restricted under 1 lb/d winter gain, only compensate 35–50% of calves that were fed to target 1.5 lb/d winter gain. Calves supplemented to achieve approximately 1.5 lb/d during the winter, maintained a weight advantage over the restricted calves throughout the summer growing season and throughout the finishing phase as well (1999 NE Beef Report; 2014 NE Beef Report). These data as well as an additional study also indicated feeding calves to gain 1.5 lb/d rather than 0.5 lb/d in the winter resulted in an economical advantage as well as a biological advantage resulting in added weight (2021 NE Beef Report).

By-products as Feed Resources for Backgrounding Diets

Using by-products or alternative feeds can reduce the cost associated with backgrounding calves if those products can be purchased and delivered cheaper than traditional feedstuffs. However, certain considerations must be made. For example, distillers grains and corn gluten feed, wet or dried, are good sources of protein and energy for growing calves. Additionally, they are high in phosphorus, eliminating the need for additional phosphorus in the mineral supplement. When feeding these by-products, producers need to have the mineral supplement formulated without additional phosphorus or feed an inexpensive form of calcium such as limestone to make sure the Ca:P ratio is never less than 1.5:1 to prevent urinary calculi (waterbelly). Condensed solubles, another highly palatable by-product of the ethanol industry, provides a good source of energy and protein, but due to high sulfur content should be limited to no more than 1/3 of total dry matter intake. Additionally, a readily available copper source such as copper sulfate should be fed when feeding ethanol by-products as sulfur can inhibit copper uptake.

Sugar beet pulp and sugar beet tailings are another by-products available to producers in western Nebraska. While they are a highly digestible fiber source (76% in vitro digestibility, similar to TDN (total digestible nutrients)), crude protein is variable (6.6 -11.5%). Therefore, samples should be sent to a commercial laboratory for analysis prior to feeding and additional protein sources may be needed to achieve the desired gain. The dry matter content of beet pulp is roughly 24%. Therefore, for ease of ration handling,

it is recommended to limit its inclusion to 30% dry matter.

By-products can be instrumental in reducing the cost of gain. However, by-products vary, not only in energy and crude protein content, but in how much of that crude protein is rumen undegradable. Additionally, certain minerals, when high in concentration, can antagonize other minerals. Therefore, producers may want to get assistance from extension personnel to make sure rations are balanced for the desired rate of gain, and risks of antagonism are reduced.

Backgrounding on Forage

There are several approaches for backgrounding cattle on forages depending on the type of forage available. For example, winter annuals such as winter wheat, triticale, or cereal rye can be grazed in the fall, to some extent in the winter and again in the spring. During the vegetative stage, these forages are > 70% TDN and usually contain 18–22% CP. As long as forage quantity is adequate, these forages typically support gains of 1.5- 2 lb/d or more depending on genetics, environmental conditions, and forage quality. Adding brassicas to a cool season annual forage can extend the quality of fall grazing. For more information on cool season annuals and brassicas for growing calves, see NebGuide G2262. Cool season perennials, such as bromegrass, will support similar gains in the spring. Grazing fall regrowth of subirrigated meadows will generally support gains of 1–1.5 lb/d and contain 12–15% CP with TDN ranging from 57–62%. Grazing summer annuals, such as sudangrass, foxtail millet, or pearl millet, allows producers to stretch native range resources. Vegetative summer annuals are typically >60% TDN and 18–20% CP and usually support gains of 1–1.5 lb/d at the proper stocking rate. Both winter and summer annual hays are also acceptable for backgrounding calves. In the summer, the TDN of native range varies from 68% TDN in spring to 52% by fall with CP values ranging from 12.8% to 8.8%. This typically supports gains of 1–2 lb/d. Supplementation has been shown to improve gains on summer grass. However, economic return is dependent on marketing time (selling in the fall vs. retained feedlot ownership) and cost of supplement. Recent data supplementing dried distillers grains the last half of the grazing season on cool season grasses in the summer resulted in similar gains to season long supplementation and improved gains over no supplementation. Supplementing only the last half of the grazing season was the most economical strategy when evaluated against 10 years of supplement cost and gain value. Winter range is typically only 49–52% TDN with CP varying from 5% to 7%. Therefore, winter range generally must be supplemented with protein to maintain desired gains. Windrow grazing of harvested forages is also an economical approach to supplementing forage for backgrounding calves. For more information on windrow grazing, see NebGuide G1616.

Does It Pay to Background Calves?

There are two major components that determine the profitability of backgrounding calves: 1) the cost of gain, and 2) the value of gain. Recently, as feed grain prices have increased, cost of gains for grain-based diets in the feedlot have gone up dramatically. At the same time, the value of gain for backgrounding calves has increased. This increase in the value of gain provides backgrounding programs the potential opportunity to profitably utilize forage-based programs to grow cattle to heavier weights prior to entering the feedlot for finishing. However, if feed costs are high and the value of gain is low, profitability is decreased. Therefore, the cost of gain needs to be calculated prior to making the decision to background calves.

The value of gain is calculated by taking the projected animal's future weight multiplied by projected sale price minus the animal's current value based on weight and estimated sale price. This dollar value is then divided by the number of pounds that animal is expected to gain from now until the animal is sold which equals the projected "value of gain."

Example:

A 550 lb steer at $1.85 = $1,017.50. Six months from now, an 850 lb steer is projected to be worth $1.65 = $1,402.50

$1,402.50 850 lbs.

-$1,017.50 -550 lbs.

$ 385.00 300 lbs. $385/300 lbs of gain = a projected value of gain of $1.28/lb.

When the value of the gain for cattle exceeds the cost of gain, then there is an opportunity to profit by growing the cattle to heavier weights.

Evaluating Backgrounding/Growing of Calves in a Production System

When considering the potential profitability of growing or backgrounding calves, producers will want to consider the cost of gain through the whole production system. For example, growing calves through the winter where low average daily gains are combined with low daily feed and care costs may result in actual costs of gain which are fairly high. These high costs of gain may be justified in a

production system if additional value can be captured from grazing those calves on spring and summer grass where low costs of gain and compensatory gain may offset winter growing expenses. Producers who have access to cornstalks may find residue grazing reduces the cost of winter gain, as they are generally economical to obtain. Supplemental protein is necessary for growing calves utilizing residue fields. The EC 278 Grazing Crop Residues with Beef Cattle provides more information on grazing cornstalk residue.

Implant Strategies for Backgrounding/Growing Calves in a Production System

Growth implants are a tool that producers can effectively use to capture additional performance from growing or backgrounding calves. Implants cause a delay in fat deposition and an increase in lean tissue accretion while ultimately changing frame size. Typically, implants will return $5-$15 worth of gain for every dollar invested in the implant. There are a variety of implants available for nursing calves, stocker, and finishing cattle. The type of implant recommended will vary with the expected rate of gain, timing of marketing, age, weight, genetics, and sex of the cattle being implanted.

Plane of nutrition must be appropriate to support the increased lean gain potential of implanted cattle. Typically, cattle gaining less than 1.0 lb per head per day experience limited benefit from implants. Also, cattle previously gaining at a low rate of gain will frequently capture additional weight gain, (compensatory gain) when they have access to a higher energy diet, thus offsetting some of the benefit from the implant during the slow gain (wintering) period.

Implanting heifer or bull calves that are to be retained for breeding can result in reduced fertility. Producers will want to evaluate whether the use of implants will be beneficial in the entire production system. Implants should always be used according to label instructions.

Ionophores

Ionophores are feed additives that depress or inhibit the growth of specific rumen microorganisms. This selective inhibition alters rumen fermentation in three major ways:

1. Improves the efficiency of energy metabolism by changing the types of volatile fatty acids produced in the rumen and decreasing energy lost during fermentation of the feed. Improved animal performance results from increased energy retention during fermentation in the rumen.
2. Decreases the breakdown of feed protein and may also decrease microbial protein synthesis. This has minimal effects on the performance of cattle on high-grain diets but may have important implications with growing cattle fed high-roughage diets.
3. May reduce the incidence of acidosis, grain bloat, and coccidiosis. Reducing these stressors results in improved animal performance.

Depending on the energy level of the diet, feeding ionophores can improve feed efficiency 3%—10% at a cost of approximately a few cents per head per day.

Calves being wintered or backgrounded on forages are frequently fed an ionophore for its benefit as a coccidiostat to reduce the incidence of coccidiosis. The level of ionophore is also important when cattle are consuming low-quality forage diets. Feeding too high a level decreases the number of cellulolytic bacteria present in the rumen, which can cause reduced fiber digestion. Also, when protein is slightly below the animal's requirement, the ionophore may reduce the breakdown of feed protein resulting in a shortage of rumen nitrogen, which is needed by the rumen microbes for growth. This shortage of nitrogen results in reduced fiber digestion. Thus, the proper level of ionophore depends on the quality of the forage being fed. Producers should know the protein and energy value of feed being fed or grazed to determine the level of an ionophore that should be fed. The effects of ionophores and growth promoting implants are additive and can be routinely used together. Always follow label directions for use of ionophores in cattle diets.

Summary

Backgrounding calves can be accomplished using several management styles. Facilities, feed resources, and available labor will influence backgrounding decisions. Properly formulating diets for nutrient content and rate of gain and calculating profitability are critical. Contact local extension personnel for assistance.

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