Coping With A Short Forage Supply – Volume II

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Hay supplies across the region are in short supply, and if hay can be found, it is expensive. Some producers have been supplementing cows on droughty pastures with hay to maintain cow weight and support lactation making a short hay supply even shorter. When forage supplies are limited, producers must decide how to best utilize local feed resources. Unfortunately, there are no cheap, easy fixes for producers that have both short pastures and limited hay supplies.

Management Strategies for consideration:

1) Body condition score cows.
2) Analyze forages for nutrient profile.
3) Inventory hay and other feed resources.
4) Pregnancy checking, culling and marketing cows.
5) Divide cow herd into management groups based on nutrient needs.
6) Utilization of crop residues.
7) Alternative feeding strategies using some combination of by-product feeds.
8) Limit feeding of nutrient dense feeds to meet requirements.
9) Minimize hay waste.
10) Adjust rations for “cold stress”.

Body condition score (BCS) cows. Body condition scoring is a valuable tool that allows producers to monitor and adjust level of nutrition without the need to weigh cows. My experience is that we “check” our cows nearly every day, but it is difficult to see a daily weight/body condition change. My recommendation is to pick one day each month to really “look” at cows and assign a BCS. At a minimum, evaluate a group of cows that are representative of your cow herd (age, breed, physiological state, etc.) and write the scores down. Next month, find those same cows and assign a BCS and then compare across months. If cows are gaining or losing more than you think they should, evaluate your rations and make adjustments.

With the summer we have just experienced, many producers with spring calving herds will have thin cows going into the fall. We know that cows calving in thin body condition (BCS 2-4) will have a longer interval between calving and first estrus and lower pregnancy rates than BCS 5-6 cows. It is difficult nutritionally to get thin cows to rapidly gain condition in late pregnancy, during early lactation and when the winter wind chill factor is well below 32^{o} F. Fat cows (BCS 7-8) can afford to lose some weight, but thin cows should be fed to gain weight before they enter the last trimester of pregnancy and the coldest part of the winter. Immediately post-weaning is an ideal time to make cow condition adjustments because nutritional requirements are low (non-lactating, middle trimester of pregnancy) and cows can more easily gain weight and condition without a lot of expensive supplemental feeds.

Analyze forages for nutrient profile. It’s always a good recommendation to know what your feeds contain, but this year it is even more important. Assuming that your available feed resources contain a certain nutrient profile could cost dearly not only next year when calving and breeding seasons roll around, but also this year if nutrients are over-fed. Corn, and soybean meal, and even most of the by-products, have a relatively stable nutrient

profile from batch to batch, but forage quality can be highly variable. As a minimum, have forage samples analyzed by NIR for dry matter, crude protein, and energy (TDN, NEm, NEg). Once forage nutrient profiles are know, rations can be developed that will meet, but not exceed, what cattle need. This analysis also helps in deciding when, where, and how much forage can be fed to best utilize available resources.

Inventory hay and other feed resources.
Step 1. Determine know how much dry matter (DM) is in a large round bale. Just because the manufacturer says, for example, that it's baler can produce a 1500 lb bale, it most likely won't be 1500 lb of DM and cows eat to a DM intake. A representative sample of bales from each cutting and field should be weighed and a sample taken to determine a DM value and nutrient profile. For inventory purposes one could assume that bales stored inside will be about 88% DM (ex. 1300 lb bale x .88 = 1144 lb of DM/bale), while bales stored outside will be about 80% DM (ex. 1300 x .80 = 1040 lb of DM/bale).

Step 2. Determine how much forage is needed per cow/day so a total winter feed need can be calculated. Dry matter intake of cows varies by forage quality and physiological stage (gestation vs. lactation). When properly supplemented to meet protein requirements, DM intake of gestating cows can range from 1.8% of body weight on low quality forages to 3% of body weight on high quality forages. For inventory purposes, if we assume good quality large round bales of forage throughout the fall/winter feeding period, a cow could consume about 2.5% of her body weight in dry matter per day. In addition, we also need to account for some waste. For large round bales stored outside, the difference between original bale weight and what is actually consumed (waste) could be estimated at 20%. Waste of bales stored inside should be less than 10%. Let's work through an example using a 1300 lb cow eating 2.5% of her body weight of good quality forage with 20% waste. In this example, we need to budget 2.5% x 1.2 = 3% of the cows body weight/day in DM. Daily DM disappearance of hay is then calculated as 1300 lb x .03 = 39 lb of DM/cow.

Step 3. Calculate how much hay will be needed/cow for the fall/winter feeding period. Let's assume we will feed hay from November 1 to April 20 (200 days). Using the example numbers already calculated above, we need to budget 39 lb of DM/day for 200 days, or 7800 lb of DM/cow. If bales are stored outside (1300 x .80 = the 1040 lb of DM/bale), then 7800/1040 = 7.5 bales are needed per cow for the feeding period. It's easy to see from this example calculation why one should give serious consideration to management of resources that will extend the grazing season using stock piled forages and/or crop residue to minimize the period of time that harvested forages are fed.

Step 4. Calculate how many days of hay are on inventory. For this example, let's assume there are 30 cows in the herd that average 1300 lb, and there are 100 large round bales of good quality hay stored outside that each contain 1040 lb of DM. Total hay DM is calculated as 100 bales x 1040 lb/bale = 104,000 lb. Daily DM disappearance is calculated as 30 cows x 39 lb of hay DM/d allotment = 1170 lb. In this example, the hay supply should last 104,000 ÷ 1170 = 88.8 days.

Step 5. Decide how and when the hay should be fed. Our long-standing recommendation has been to feed the lowest quality feeds when the nutrient requirements are lowest (mid-gestation, after weaning) and the highest quality forages when nutrient requirements are highest (late gestation/early lactation). Limit feeding of hay and supplementing with other

nutrient dense feeds to meet the animals requirements is an option and will be discussed later in this document

Pregnancy checking, culling and marketing cows. If not already completed, now would be a great time to consider pregnancy checking spring calving cows. Open cows will consume a lot of high priced feed this winter and should be considered prime candidates for culling. Pregnancy checking cows can be accomplished by most large animal veterinarians on cows that are at least 35-days pregnant. A sound management strategy this year would be to only feed cows through the winter that are diagnosed pregnant.

No one likes to sell pregnant cows, but this year we need to prioritize cows by their potential for both making money and reducing the winter feed bill. Young cows in the herd (2-3 year olds) have the potential for having a long productive life and should represent some of the better genetics in the herd. These young cows are not yet mature (teeth, skeleton, weight and capacity to consume large quantities of low quality forages) and will require a more nutrient dense ration than older cows. Cows that are 4-10 years old are in their prime and should be able to handle a bit more nutritional stress than either younger or older cows. Old cows (>10 years) are typically past their prime and are more prone to soundness problems such as arthritis, broken mouths, bad udders, etc.

In addition to open cows, consider culling cows that have lost their calf (fall calving), unsound cows (bad udders, arthritic, stifled, blind in one or both eyes, cancer eye, etc.), cows with broken mouths (lost teeth), old cows that are near the end of their productive life, tail-end performing cows that have a history of weaning lightweight calves, and late calving cows.

Divide cow herd into management groups based on nutrient needs.
The cow herd should be divided into at least three management groups: 1) replacement heifers; 2) young (1^{st} calf heifers) and other thin cows; and 3) mature moderate conditioned cows. These groups differ in their capacity (volume) to consume feeds, the nutrient density of the rations they consume, and their ability to compete at the feeder due to dominance/subordinate relationships. Younger females need higher quality feeds, while older cows have the ability to consume larger quantities of lower quality feeds.

Utilization of crop residues. Baled corn stover, wheat straw, and soybean straw can be used to stretch forage supplies. Nutritionally, corn stover can provide more nutrition than wheat straw. Soybean straw provides the lowest level of nutrients and is the least palatable. None of these crop residues are a direct substitute for high quality pasture or hay, but if properly supplemented, gestating cow requirements can be satisfied. When using low quality forages, make a conscience effort to watch cow body condition. If cows start loosing condition, additional energy and protein supplementation will be needed.

There is no question that grazing corn stover is more economical than harvesting as large round bales. Begin thinking about how corn stalk grazing might fit into winter feeding strategies. Consider grazing corn stover in areas that can be fenced and that have water available. A single “hot” wire can be used as both perimeter and dividing fences if cows have been trained to respect an electric fence. Corn fields should be divided with a “hot” wire and strip grazed to maximize utilization and minimize trampling of shucks and leaves. If there is significant ear drop in a field, cows should be supplemented with increasing levels of corn before grazing to adapt the rumen and minimize the risk of acidosis. The nutrient profile of corn plant residues is highest immediately after grain harvest, and they have

higher nutrient profiles when grain is harvested earlier, rather than later in the season. During the first 30 days of corn stover grazing, a mid-gestation, spring calving beef cow can probably come close to meeting her nutrient requirements if provided free-choice access to water and a high quality mineral mix fortified with vitamins. After 30 days, residue quality will decrease and a protein supplement is usually needed.

Wheat straw and Grazing or baling of corn residue. The chopper should be disengaged when harvesting grain to allow shucks and cobs to fall directly behind the combine. This will help to minimize their deterioration, since shucks and leaves have more nutrient value than the stalks. If corn residues are to be baled, consider baling only those 3-4 rows directly behind the combine where shucks and leaves have been dropped. This will be a higher quality forage resource compared to harvesting all residue material in the field.

Alternative feeding strategies using some combination of by-product feeds.
Crop residues and other low quality forages are a source of nutrients that should be considered, but they are characteristically low in protein (typically 4-5% CP) and energy (45-55% TDN). For comparison, the CP requirement of beef cows is about 8% during gestation and 12% during lactation, while the TDN requirement is about 53% and 63%, respectively. When feeding crop residues, corn byproducts (such as corn gluten feed and distiller's grains), become attractive sources of both energy and protein. On a dry matter basis, corn gluten feed contains about 23% CP and 80% TDN, and distiller's grains plus solubles contain about 28% CP and 88% TDN. Feeding of corn byproducts to cows, however, should not be done without caution. Over-feeding of these byproducts can result in excessive amounts of fat (which can affect rumen fermentation), sulfur (which can bind with copper and cause a copper deficiency), and nitrogen (which could lower fertility and reduce embryo survival). Sample rations are shown in Table 1 that can be used safely with cows.

Table 1. Sample dry, mid gestation wheat straw rations (lb/day as-fed basis[a)] .

Ingredient[b]	**Ration 1**	**Ration 2**	**Ration 3**	**Ration 4**
Wheat straw	free choice	free choice		
Dry corn gluten feed	9		6	
Dry distiller's grains		7.5		5
Limestone	.30	.20	.20	.10
TM salt	.20	.20	.20	.20
Magnesium oxide			.05	.05
Vitamin A	30,000 IU/d	30,000 IU/d	30,000 IU/d	30,000 IU/d

[a] Assumes a 1250 lb non-lactating, crossbred cow, 4-6 mo. pregnant, gaining .5 lb/d.
[b] Ingredients within ration are listed as lb/d on an as-fed basis.

Table 2. Sample dry, mid gestation corn stover rations (lb/day as-fed basis[a)] .

Ingredient[b]	**Ration 1**	**Ration 2**	**Ration 3**	**Ration 4**
Corn stover	free choice	free choice	free choice	free choice
Corn grain, cracked			2.7	
Dry corn gluten feed	5.8			
Dry distiller's grains		4.8		5
Soybean hulls				
Soybean meal, 48%			2.0	
Limestone		.20	.20	.10
TM salt	.20	.20	.20	.20
Magnesium oxide			.05	.05

Vitamin A	30,000 IU/d	30,000 IU/d	30,000 IU/d	30,000 IU/d

[a] Assumes a 1250 lb non-lactating, crossbred cow, 4-6 mo. pregnant, gaining .5 lb/d.
[b] Ingredients within ration are listed as lb/d on an as-fed basis.

Limit feeding hay. Purdue data suggests that limiting daily hay intake can also meet cow requirements if a properly formulated grain-mix is fed. In essence, we are limit feeding a high concentrate ration that would be similar to a feedlot finishing diet. This strategy requires careful management and 30 inches of bunk space per cow to provide all cows equal access to limited amounts of feed. Cows should be separated into at least two feeding groups – a) young, timid, and old cows and b) mature cows. Producer observation of dominance/subordination when cows are fed is important and animals may need to be re-assigned to another feeding group. Similar to starting feedlot cattle, they need to be started slowly on the concentrate mix and the amount delivered per cow increased over time. A good rule of thumb is to feed hay free-choice and start concentrate feeding at 4-lb/cow. Increase the concentrate amount by 1 lb/head on an every other day basis. When cows reach the desired level of concentrate feeding, begin to reduce the amount of hay fed to the designated level. When limit-feeding is started, expect cows to bawl and think they need to be fed more, but they will adapt to not having a full rumen in several days.

Sample rations for a 1250 lb crossbred cow, 4 months pregnant, gaining .25 lb/d have been formulated and are shown in Tables 2 (dry cow) and 3 (lactating cow). Note that free-choice trace mineralized salt will not meet the mineral or vitamin requirements. Magnesium and Vitamin A are deficient in all of these limit-fed diets and therefore, a mineral containing Vitamin A and higher levels of magnesium is needed. When corn-based byproducts are in the diet, a mineral mix that contains additional calcium (limestone or calcium carbonate) is important to balancing the calcium:phosphorus ratio. In contrast, when corn-based byproducts are not included in the diet, additional phosphorus (such as dicalcium phosphate) is typically needed in the mineral mix.

Table 2. Sample limit-fed, dry cow rations (lb/day, as-fed basis[a,b,c]).

Ingredient[b]	**Ration 1**	**Ration 2**	**Ration 3**	**Ration 4**
Grass hay[d]	5	5	5	5
Corn	8.70		4.25	5
Soybean meal, 48%	.90			
Dry corn gluten feed			6	
Soybean hulls		10.75		
Dry distiller's grains				4.60
Limestone			.30	.20
Dicalcium phosphate	.05	.05		
TM salt	.25	.10	.10	.10
Magnesium oxide	.05	.02	.02	.05
Vitamin A	30,000 IU/d	30,000 IU/d	30,000 IU/d	30,000 IU/d

[a] Assumes a 1250 lb non-lactating, crossbred cow, 4 mo. pregnant, gaining .25 lb/d.
[b] Ingredients within ration are listed as lb/d on an as-fed basis.
[c].When limit feeding, we recommend feeding 200-250 mg of Rumensin per cow/day
[d] Assumes moderate quality grass hay.

Minimizing hay waste. Results from several Purdue studies with dry, gestating beef cows suggest that moderate quality orchardgrass-alfalfa hay supplies can be stretched by limiting cow access time to large round bales. In those 90 day, late gestation studies, cows were

allowed 4-, 8-, 12-, and 24-hour access time per day to large round bales fed in a hay feeder. Feeder space was adequate to allow all cows in each treatment simultaneous access to hay. Cow weight change and body condition score change were not significantly affected by length of access time. Average cow weight gain on the 12 and 24 hour treatment were similar at approximately 58 lb. Weight gain for the 8-hour treatment tended to be highest at approximately 65 lb, while weight gain for the 4-hour treatment tended to be lowest at approximately 49 lb. There was a 37.2%, 17.6% and 4.4% reduction in total hay dry matter disappearance for the 4, 8 and 12 hour treatments, respectively, compared to the 24 hour treatment. This study would suggest that allowing cows only 4-8 hours/day of access time to moderate quality, large round bales of hay can reduce total hay needs by 17-37 % (DM basis) without adversely affecting cow performance.

Adjust rations for "cold stress".

For each 10^{o} drop in wind chill factor below 30^{o} F increases the energy requirements:

13% for moderately conditioned cows with a dry winter hair coat

30% for cows that are either thin or have a wet hair coat

For example, if we have a 10^{o} F wind chill factor and a group of moderately conditioned cows with a dry winter hair coat, then the nutrient requirements increase by 26% above their maintenance requirement (30-10 = 20^{o}; 2 units of 10^{o} x 13% = 26%). If this is a thin or wet cow, the requirements increase by 60% (30-10 = 20^{o}; 2 units of 10^{o} x 30% = 60%). Putting out more hay will not meet this increase in energy need. An easy way to meet these requirements for cold stress is to supplement corn when wind chill drops below 30^{o} F. It takes about 1 lb of corn for each 10^{o} drop in wind chill below 30^{o} for moderately conditioned cows with a dry winter hair coat, but it takes 2.3 lb of corn for wet or thin cows. In the example above with a 10^{o} wind chill, the moderate cows would need 2 lb of corn and the thin cows would need 4.6 lb of corn to maintain body temperature, weight and condition.

Summary.

There are a number of feeding and management strategies that need to be considered both individually and collectively. For example, it may be significantly more economical to cull open and unproductive cows, limit feed hay (access time or quantity) to remaining cows and to supplement with nutrient dense feeds to meet their requirements. Each operation needs to develop a strategy that reduces costs and optimizes return on investment.

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Table 3. Sample limit fed, lactating cow rations (lb/day, as-fed basis[a,b,c]).

Ingredient[b]	**Ration 1**	**Ration 2**	**Ration 3**	**Ration 4**
Grass hay[d]	7	8	6	7
Corn	14.50	4.25	9.10	9.50
Soybean meal, 48%	2.10	.90		
Dry corn gluten feed			9.10	
Soybean hulls		12		
Dry distiller's grains				7
Limestone	.20		.50	.30
Dicalcium phosphate	.10	.20		
TM salt	.20	.20	.20	.20
Magnesium oxide	.10	.05	.05	.05
Vitamin A	40,000 IU/d	40,000 IU/d	40,000 IU/d	40,000 IU/d

[a] Assumes a 1250 lb non-lactating, crossbred cow, 4 mo. pregnant, gaining .25 lb/d.
[b] Ingredients within ration are listed as lb/d on an as-fed basis.
[c].When limit feeding, we recommend feeding 200-250 mg of Rumensin per cow/day.
[d] Assumes moderate quality grass hay.

Stockpiling forages. Application of 50 lb of nitrogen per acre before late August, if the rains return, can boost fall regrowth of cool-season grasses. In a normal year, this works well for building a stockpiled forage resource that can be used in late fall to extend the grazing season. If urea is the nitrogen fertilizer of choice, apply it when rain is predicted since it volatizes to the atmosphere in hot, dry weather.

Drought stressed corn for grazing, green chop or silage. Drought stressed corn, sudangrass, and sorghum-sudangrass, in addition to certain weeds such as pig weed, lamb's quarters, and Johnson grass can contain high levels of nitrates. The nitrate levels in plants can go up and down rapidly. Nitrate levels tend to accumulate in the lowest part of the stalk, not in the grain or fruit. Cool season grasses such as tall fescue, orchardgrass, and timothy typically do not accumulate nitrate, and legumes are seldom a problem. Green chop made from drought stressed crops such as corn grown on highly fertile soils is the most dangerous. Nitrate accumulation is usually not excessive unless adequate soil moisture is present. Drought stressed crops that receive rain within 5-7 days before harvest can accumulate significant levels of nitrate.

Ensiling typically reduces nitrate levels by 40-60%, and in some cases 80-90%. Toxic gasses such as nitrogen dioxide ($N0_2$) and nitrogen tetroxide (N_20_4) are produced in the ensiling process and may form a brown colored gas on top of the silo. Livestock and people have been killed when this gas, which is heavier than air, floats down a silo chute and into a barn or confined area. Crops that are put in a silo in an extremely dry condition may lose only 20% of the nitrate.

Symptoms of acute nitrate poisoning in animals are related to the lack of oxygen in the tissues. These include muscular weakness, incoordination, accelerated heart rate, difficult or rapid breathing, cyanosis, coma, and death. Less severely affected animals may be listless and only show rapid respiration when exercised. A drop in milk production, abortion due to lack of oxygen getting to the fetus, poor performance and feed conversion can be observed in chronic cases. Of the crop plants, drought stressed green chop corn is the

most likely to cause nitrate toxicity. Sorghum/Sudan harvested or grazed under the same conditions may also cause problems. Oat hay harvested from land that has had heavy applications of nitrate fertilizer and a rapid regrowth from rain just prior to harvest has caused a few cases of nitrate poisoning.

If there is concern about nitrate levels in feeds, consider the following:

1. Those who intend to feed drought stressed green-chopped corn from high fertility soils should consider testing for nitrates, especially if a short period of rapid growth has occurred just prior to harvest.
2. Thin cattle in poor health, or those suffering from respiratory disease are more susceptible to nitrate poisoning.
3. Do not allow hungry cattle access to suspect feeds. Take time (1 to 3 days) to make sure cattle are full and consuming a significant quantity of a bulky forage such as good quality grass hay and then introduce suspect feed slowly into the diet.
4. Gradually introduce cattle to suspect forages over a period of several days. The objective is to give the ruminal microorganisms the opportunity to adapt to high nitrate intake.
5. Dilute high nitrate suspect feeds with low nitrate feeds. Dilution is one method that can be used to help ruminal microorganisms adapt to high nitrate feeds. This can be accomplished by blending suspect feeds with low nitrate feeds such as grass hay or concentrates. Grain feeding has the additional benefit of providing ruminal energy to stimulate the conversion of nitrate to nontoxic nitrogen compounds in the rumen.
6. Green chopped suspect forages should be harvested daily in the amount to be fed that day. Storing green chopped forages on wagons for later use can result in feeds that are more dangerous.
7. When grazing high nitrate forages, provide a palatable, low nitrate hay or concentrates to dilute the nitrate. In addition, consider limiting the time allowed for grazing suspect forages for the first 6 to 8 days by increasing the grazing time each day. For example, cattle that have their rumens full of hay might be allowed to graze high nitrate forage for 2 hours on the first day and increase by 2 hours each day over the next 6 days. Remember, nitrate levels are highest shortly after a drought-ending rain.
8. When grazing suspect forages, stock lightly so animals can choose lower nitrate leaves over higher nitrate stems.
9. Provide large quantities of fresh drinking water. Water dilutes nitrate concentrations in the rumen and reduces the potential of toxicity.

Creep feeding. Providing the nursing calf with supplemental feed takes some pressure off of the cow and can boost calf weaning weights. Purdue data suggests that creep feeding calves can increase calf weights by 30-50 lb (range 0-125 lb) and cow weights by 30-50 lb (range 0-200 lb) at the time of normal weaning. The response to creep feeding is dependent on forage quality, forage availability, and location of the creep feeder. In years where forage quality and/or quantity are limited, the response to creep feeding is higher than when forage quality and quantity are high. Location of the creep feeder can impact calf use and feed intake. Creep feeders should be located where cows congregate such as near water, mineral feeder, and shade. Sample creep rations (Table 4; 15% CP on a dry matter basis) have been created that should support gains of at least 2 lb/d. Rumensin should be added to these creep rations to stabilize intake, minimize coccidiosis, and improve feed efficiency. Tylan should also be added to minimize the potential for liver abscesses. Calves should be vaccinated for over-eating disease (clostridia type C&D

toxoid). Once creep feeding is started, make sure creep feeders do not run empty. This can cause over eating, digestive upsets, acidosis, and founder when feed is reintroduced.

Table 4. Sample creep rations (%, as-fed basis)

Ingredient[a]	Ration 1	Ration 2	Ration 3	Ration 4
Corn	40			28
Oats	40			
Soybean meal, 48%	16			
Dry corn gluten feed		30		40
Soybean hulls		66	70	28
Dry distiller's grains			25	
Limestone	2	2	2	2
TM salt	2	2	2	2

[a] Ingredients are listed as a percent (%) on an as-fed basis.
Add 0.5 lb of Rumensin 80/ton to = 20 mg of Rumensin per lb of ration.
Add 1.5 lb of Tylan 10/ton to = 7.5 mg of Tylan per lb of ration.
To be fed with free choice, high quality cow mineral, fortified with Vitamins A and E.

Early weaning. Early weaning calves is a viable option for conserving short forage supplies. Early weaning not only lowers forage intake of the cow by removing the lactation requirement, but also eliminates the forage intake and trampling losses associated with the calf. Based on Purdue data, early weaned cows will consume 25% less dry matter than cows nursing a calf. When all factors are considered collectively, over a 30% conservation of pasture resources could be expected if calves are early weaned.

When forage resources are limiting, non-lactating cows in late first trimester/early second trimester of pregnancy can maintain, or gain body weight and condition much more easily than lactating cows. In a normal year, it is not uncommon for cows with early weaned calves to enter the winter with a .5-1.0 body condition (40-80 lb) advantage over cows that have normal weaned calves. In addition, early weaned calves are much more efficient in converting feed to gain (~4:1) than when the cows are fed to support lactation and gain. Based on Purdue research, the recommendation is that individual calves need to be at least 70 days of age when weaned. Calves weaned at younger ages tend to have stunted growth and look like pot-bellied, orphaned calves. Sample early wean rations (Table 5; 15% CP on a dry matter basis) have been created that should support gains of over 2 lb/d when fed to appetite with free choice hay, minerals and water. Rumensin should be added to the early wean ration to stabilize intake, minimize coccidiosis, and improve feed efficiency. Tylan should also be added to minimize the potential for liver abscesses. If calves were not creep-fed before weaning, begin feeding the grain mix at 0.5% of body weight/day (i.e. 300 lb calf x .005 = 1.5 lb/head daily). Increase grain mix gradually (approximately 1lb/head on an every other day schedule) over the next 7-10 days to equal approximately 1.5% of body weight (i.e. 300 lb calf x .015 = 4.5 lb/head daily). If calves were creep fed prior to weaning, begin feeding grain mix at 1% of body weight.

Table 5. Sample early wean rations (%, as-fed basis[a]).

Ingredient	Ration 1	Ration 2	Ration 3	Ration 4
Corn	46	43.5	21	32.75
Oats	35			
Soybean meal, 48%	14.5			
Dry corn gluten feed		52	44	

Soybean hulls			32	32
Dry distiller's grains				33
Limestone	1.50	3	1.5	.75
Dicalcium phosphate	1.50			
TM salt	1.50	1.50	1.5	1.50

[a] Ingredients are listed as a percent (%) on an as-fed basis.

Add 0.5 lb of Rumensin 80/ton to = 20 mg of Rumensin per lb of ration.

Add 1.5 lb of Tylan 10/ton to = 7.5 mg of Tylan per lb of ration.

To be fed with free choice, high quality mineral fortified with Vitamins A and E.

To be fed with free choice, high quality grass or grass-legume hay.