

Beef Cow Rations and Winter Feeding Guidelines

October 2021



Feeding beef cattle during Saskatchewan winters can be a challenging experience. Frame size, body condition, stage of production, feed quality, types of feed and fluctuations in air temperatures all impact feed consumption and rates of gain.

Over-feeding is costly and wastes feed while underfeeding affects body condition and may cause poor performance in the breeding herd.

The CowBytes® Ration Balancing software, developed by Alberta Agriculture and Forestry, was used to develop the rations in this guide. It uses prediction equations based on the National Research Council "Nutrient Requirements of Beef Cattle - 2000 Update." Long-term average feed nutrient values were used.

More accurate rations can be developed by having your feed analyzed at a feed testing laboratory. The results of the feed analyses can then be incorporated into the CowBytes® software. The services of a regional livestock and feed extension specialist or a beef nutritionist in the private industry can assist in developing rations. A Ration Preparation Worksheet (Appendix M) should be filled out in advance of developing rations to ensure they are specific to your livestock's needs.

The rations contained in this guide were designed to provide an acceptable level of nutrients required by 1,400 lb. cows with an expected calving date of April 1. The following information and rations are intended to be used as general guidelines. Responsibility for interpretation of the rations rests with the user.

Body Condition of the Cows

The body condition of cows at the start of the winter feeding period has a major effect on the amount and quality of feed required. Cows have greater difficulty gaining weight in cold winter conditions than during fall when temperatures are warmer. Thin cows must gain weight throughout the winter feeding period. They require a good quality forage or average quality forage with supplemental grain or pellets.

Cows in good condition in the fall do not need to gain actual body weight. They need enough feed to gain weight equal to the weight of the calf and calf bed. This usually amounts to 150 to 180 pounds of gain in an average sized cow. This mass is lost the day the calf is born. Average quality hay fed with small amounts of grain or pellets should meet the winter feed requirements of these cattle. If your cows are in good condition (a body score of three to three and a half on a five-point scale), select rations that will give a modest average daily gain.

The rations in this guide have been designed to account for the weight of the fetus and calf bed.

Low Quality Feeds - Cold Weather Feeding

Sudden drops in temperature during the winter months will cause cows to consume more feed. If cows are fed poor quality feeds such as straw, they will attempt to consume more than they can digest and may become impacted. Processing the poor quality feed through a hammer mill or tub grinder will only increase feed intake which increases the potential for impaction when a sudden drop in temperature occurs.

During periods of cold temperatures, increase the energy component of the ration by feeding additional grain or pellets at a rate of one lb. per head per day for every -5 C that the temperature is below -20 C at mid-day. For example, if the afternoon air temperature was -35 C, feed an additional three pounds of grain or pellets per cow.

Divide the Herd into Different Feed Groups

- **Group I - Mature Cows in Good Condition**
Average quality hay supplemented with grain or pellets, minerals, fortified salt and vitamins will generally meet the nutritional needs of this group.
- **Group II - Bred Replacement Heifers and Second Calf Heifers**
These young growing animals do not compete effectively for feed with the mature cows. The heifers require good quality hay and extra grain to meet their needs for growth and development. These animals are gaining body weight in addition to the developing fetus.
- **Group III - Thin and Old Cows**
These cows will need extra energy to get them through the winter. Some older cows may have hardware disease or may not have sound teeth.

Feed analyses provide important information on the nutrient levels of the feed and should be used to accurately formulate rations.

If the ration is based on straw or low quality hay, or if feed intake is limited, it is more important to separate the herd into different feeding groups to match the nutritional needs of each group.

If the cow herd cannot be divided into three groups, heifers and the thin or old cows could be fed together. A second option is to cull the thin or old cows rather than trying to feed them over the winter.

Low Feed Inventory

Cull any non-productive animals as soon as possible. Use ration projections to estimate feed needs and cull additional animals if needs exceed feed availability.

Salt and Minerals

All winter feeding programs for cows require the use of additional salt and minerals. Trace Mineralized Fortified Salt (TM Fortified Salt) is a popular option for mineral supplementation. It contains similar levels of iodine and cobalt as found in blue salt while also containing a number of important and necessary trace minerals (copper, zinc, manganese and sometimes selenium). These trace minerals are commonly deficient in Saskatchewan grown forages and grains used for beef production.

Grass or legume-hay rations generally require the addition of a 1:1 mineral (equal parts of calcium and phosphorus). Rations based on greenfeed, cereal silage, straw-grain mixtures or rations containing high amounts of grain or pellets, often require additional levels of calcium. Provide a 2:1 mineral (two parts calcium to one part phosphorus) or a 3:1 mineral. Most cows require two to four ounces of mineral per head per day. The required amount will depend on the type of mineral being fed; check the label for specific guidelines. Some producers provide a 1:1 mineral and add additional limestone which contains about 36 per cent calcium. Feed grade limestone is available at most feed supply outlets and is inexpensive.

TM Fortified Salt can be mixed with most minerals, but not all. Weather protected products should not be mixed with salt. Consult with the product retailer to confirm before adding salt. Adding salt will encourage the cows to consume the mineral on a free-choice basis. A common mixture is one part loose salt to two parts mineral. All other sources of salt must be removed to ensure that the cows will consume enough of the salt-mineral mixture. Commercially available minerals can be purchased that have salt pre-mixed with the mineral.

The cow's daily requirement for mineral increases after calving and throughout the lactation period. A 1:1 or 2:1 mineral is usually required. Heavy milking cows may require additional calcium and phosphorus. Feed grade limestone or 3:1 mineral can be used. The mineral should be mixed with grain or concentrate to ensure adequate intake.

Another option is to feed fortified pellets. These pelleted products are fortified with minerals, trace minerals, vitamins and salt. They are often competitively priced against barley.

Remember, cows eat what they like, not what they need. Cows will eat until full, given voluntary free-choice access to feed. Cows do not balance their nutrients or nutritional needs, only their intakes. In fact, cows can only balance four things:

- the air they breathe;
- the water they drink;
- the amount of feed they consume each day (given voluntary free-choice access to feed); and
- salt (and only when sodium levels are not excessive in the water or feed).

On a free-choice basis, feed supplements and minerals are consumed in a hit and miss fashion. Some cows will eat the required amount, some cows will consume excessive amounts and others will ignore the supplement or mineral. It is better to mix the feed supplement or mineral into a small amount of grain or pellets (three to four pounds per head per day) to help ensure that each cow receives her share. The other option is to feed fortified pellets containing a balance of minerals, vitamins and supplements.

If feeding a Total Mixed Ration (TMR), mineral supplements can be added to the mix and metered out according to label directions.

Having the feeds analyzed will give a much more accurate account of the amount and type of minerals and supplements that your cows will require. This is even more important when feed stores have limited options available.

TM Fortified Salt was used to formulate the rations in this guide. If selenium is being supplemented, use a single source of selenium. If selenium is contained in more than one source of supplement (example: fortified salt and mineral), check with a regional livestock and feed extension specialist or beef nutritionist to ensure that a safe level of selenium is being fed. Excessive amounts of selenium can be toxic.

Vitamins

Vitamins are measured in International Units (IU's). Grains contain little or no vitamins. Forages and silage contain highly variable levels of vitamins.

Vitamin levels decrease as storage times increase. It is best to assume that cut forages do not supply vitamins A, D or E.

Prior to calving, beef cows require 40,000 to 50,000 IU's of vitamin A, 4,000 to 5,000 IU's of vitamin D and 300 IU's of vitamin E per head per day. After calving and prior to grazing green grass, each cow needs 70,000 to 90,000 IU's of vitamin A, 7,000 to 9,000 IU's of vitamin D and 500 IU's of vitamin E daily.

Vitamins A, D and E are stored in the liver and fatty tissue and are used when needed. They can be fed daily, weekly, monthly or injected once every two to three months. The vitamin pre-mix can be blended with grain or concentrate. Many mineral and beef supplements also contain varying levels of vitamins.

A common source of vitamin supplementation is a pre-mix of vitamin A-D-E containing 10,000,000 IU's of vitamin A per kg. One-quarter (0.25) ounces of this vitamin supplies 71,000 IU's (1.0 ounce of this vitamin pre-mix supplies 284,090 IU's). Exercise caution if using triple strength vitamin. These products contain 25 million to 30 million IU's of vitamin A per kg and they often contain high levels of selenium (1,000 to 1,200 mg per kg). Over feeding this supplement can lead to selenium toxicity problems in cattle. Ensure that proper levels are being provided.

The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A and 10,000 IU's of vitamin E per kg. Vitamin pre-mixes from different manufacturers contain varied levels of vitamin A-D-E. Follow label directions carefully. Measure and be sure.

Water

During winter, a mature cow will consume 10 to 15 gallons of water per day. It's important to have the water analyzed to determine levels of dissolved minerals. Minerals contained in water are additive to minerals contained in feeds;

- sulphates can impair copper absorption causing copper deficiency;
- nitrates can cause production problems;
- high levels of Total Dissolved Solids can reduce weight gains and causes scouring; and
- watch for other contaminants.

Ministry of Agriculture Regional Offices can assist livestock producers with water testing and interpretation of the results.

Analyze the Feeds and Monitor the Cattle

The rations provided in this package of information were formulated using long-term average feed values. It is advised to feed test each of the feed components prior to the start of your winter feeding program. Analyses of the hay and silage are most important as the nutrient levels can vary dramatically. The nutrient levels in straws and grains tend to have less variability but a feed analysis could be performed to confirm nutritional value, especially if they make up a significant portion of the ration. Where alternative or high risk feeds are used, additional testing options such as nitrate, sulphur or mycotoxins should be considered. Consult a nutritionist or livestock and feed extension specialist for assistance in selecting test options. During the winter feeding period, the condition of the cattle must be observed and monitored. Adjust the rations to accommodate the body condition and appetite of the cattle, changes in the weather and differences in feed sources. The sample rations in this package are based on feeding cattle during normal winter temperatures which range from -5 C to -20 C. Feed an additional one pound of grain or pellets per head per day for every five degrees that the temperature is below -20 C at mid-day.

60 Days Prior to Calving

Decrease the amount of roughage fed by approximately 15 per cent and increase the amount of grain or pellets fed by 15 per cent. The capacity of the rumen decreases as the fetus develops, especially during the last half of the third trimester. As the unborn calf develops, it occupies more and more space within the body cavity reducing the space available for bulky feed. Grain or pellets take up less room and are more nutrient dense than roughage. Whenever possible, choose hay over straw as a source of roughage in late gestation.

After Calving - Lactation

Milk production places a significant increase on the cow's requirements for energy, protein and minerals. When feeding high grain rations or high volumes of pellets, feed one-half of the grain or pellets in the morning and the other half in the afternoon.

A 1,400 pound cow can safely eat about eight pounds of grain or pellets at one feeding. Ensure there is adequate feed bunk space to minimize crowding. The larger or more aggressive cows will often eat more than their share of concentrate. Smaller or less aggressive cows may not have access to their share.

Reduce or eliminate forced feeding of straw after calving. Most straw rations do not provide adequate levels of energy during the lactation period. If cattle are fed a straw-grain ration, provide a good quality protein supplement such as canola meal, alfalfa pellets or a commercial beef protein supplement after calving. Adding any type of hay, even slough hay, to a straw ration will improve the nutrient supply to the cow.

Make Allowance for Feed Wastage

No allowance was made for feed wastage in these rations. Wastage can range from five to 25 per cent or more depending on the type of feeding system used.

Limit Feeding or Restricting Feed Intakes

Feed about one per cent of the cow's body weight as dry matter forage per cow per day. The energy and protein must be balanced by feeding an appropriate amount of grain or fortified pellets.

To avoid digestive problems, the forage should be fed whole or if processed, it should not be shredded shorter than three inch lengths.

The forage should be fed in the morning prior to feeding the grain or pellet concentrate.

Do not feed more than eight pounds of concentrate at one feeding. Ideally, provide some straw or poor quality roughage such as slough hay prior to the afternoon feeding of concentrate to reduce digestive upset.

It is important to supply a balanced ration that meets all mineral, vitamin and salt requirements. Cows on this type of a feeding program will be hungry as their dry matter intake is not being met.

Ensure adequate space so that each animal has access to its share of forage and concentrate.

Cows should be in good body condition prior to the onset of cold weather. Adjustments to the feeding program should reflect changes in outside air temperatures.

Provide adequate bedding and shelter from the wind to reduce effects of cold stress.

Moulds and Moulded Feeds

The nutritional value of moulded feed is reduced. Mouldy feeds can be very dusty due to the presence of mould organisms and spores. When the dust is inhaled, a type of fungal pneumonia may develop. This type of pneumonia is difficult to treat. Mould and certain types of fungi can produce mycotoxins which can be extremely harmful if ingested.

Some mould spores may pass through lesions in the rumen wall and are carried by the bloodstream where they can settle in the pregnant uterus, causing uterine infections and mycotic abortions. Some spores produce toxins which can be extremely potent, causing abortions or weak, deformed calves. Other symptoms include internal bleeding, vaginal and rectal prolapse, gangrene-like symptoms and paralysis. Estrogenic compounds produced by some moulds may affect lactation and cycling.

Ideally, do not provide mouldy feeds or mycotoxins to pregnant or lactating cows. Diluting these contaminated feeds with good quality feeds may help reduce the potential for problems. Ensure adequate levels of vitamin A if mouldy feed must be used. There are several tests available to screen for the presence of mould organisms and mycotoxins.

Poisonous Plants and Weeds

Poisonous plants are present in Saskatchewan. Common examples of poisonous plants include water hemlock and seaside arrowgrass. Identify unusual plants before baling them.

In addition to poisonous plants, noxious and invasive weeds can easily be brought in to an operation through purchased feed or ditch hay. Once established, weeds like burdock, absinthe and leafy spurge are very difficult to eradicate and can negatively impact forage production.

Average Values of Feeds and Supplements

A table of average values of feeds and supplements used to develop the sample beef cow rations is provided (see Appendix A).

The following are considerations and precautions with some types of feeds. Additional considerations can be found in Appendix B, Feed Management.

Considerations/Precautions: Alfalfa Hay

- Potential for frothy bloat.
- Tends to have high protein and energy levels.
- Typically use a 1:1 mineral.

Considerations/Precautions: Alfalfa - Grass Hay

- Usually contains good levels of protein and energy.
- Typically use a 1:1 mineral.
- Example rations using alfalfa grass hay (see Appendix C).

Considerations/Precautions: Canola Hay

- Canola hay makes a surprisingly palatable and nutritious hay.
- Cut in the late-bloom to mid-podded stage, crude protein averages about 15 per cent, total digestible nutrients (TDN or energy) 60.4 per cent, acid detergent fibre (ADF) 35.8 per cent, and calcium 1.16 per cent (values on a dry matter basis). This hay is similar to a good quality alfalfa grass hay.
- Cut at a later stage of development, canola that is fully podded and stemmy with little or no leafy material left on the plant, crude protein averages about 10 per cent, TDN 49.8 per cent, ADF 45.9 per cent and calcium 1.1 per cent. This feed is less palatable and, nutritionally, is more like slough hay.
- Canola can accumulate high levels of nitrates and has high levels of sulphur. Testing is recommended, ensuring that dietary levels are not exceeded through other feeds or water.
- The National Research Council "Nutrient Requirements for Beef Cattle" recommends that the total dietary intake of sulphur should not exceed 0.4 per cent of dry matter intake. Sulphur levels of canola can range from 0.5 per cent to 1.3 per cent or higher. High levels of total dietary sulphur initially reduce feed intakes and lower

rates of gain. As sulphur levels increase in the rumen, the production of thiamine (vitamin B1) is impaired, and scouring may become evident in affected animals. Thiamine deficiency may develop, especially in younger animals.

- High levels of dietary sulphur can also result in polioencephalomalacia (PEM). If left unchecked, death can occur.
- High levels of dietary sulphur can inhibit copper absorption and cause copper deficiency. Producers using canola as hay or silage should provide trace mineralized salt containing copper levels of 2,500 mg per kg or higher, and selenium at 90 to 120 mg per kg. Minerals should contain copper levels of at least 2,500 mg/kg or higher. If no selenium is present in the salt being provided, be sure to supply a mineral that contains selenium at 25 to 60 mg/kg.
- Canola hay or silage can be an excellent feed, but as a precaution, producers should limit its total intake to 40 to 50 per cent of the total ration on a dry matter basis.
- Typically use a 1:1 mineral.
- Example rations using canola hay found in Appendix D.

Considerations/Precautions: Canola Silage

- Canola cut for silage during the early to mid-podded stage of development, averages about 16 per cent crude protein, 56.3 per cent TDN, 36.8 per cent ADF, and 1.2 per cent calcium (dry matter basis).
- Swathed canola may have to cure for several days to dry down to 60 to 65 per cent moisture.
- Canola makes excellent quality silage (baled or chopped and packed in a pit).
- Same feeding precautions as canola hay.
- Typically use a 1:1 mineral.
- Example rations using canola silage are found in Appendix E.

Considerations/Precautions: Cereal Greenfeed

- Cereal greenfeed can accumulate high levels of nitrates during times of drought, frost or hail. A test for nitrates is recommended.
- Greenfeed can also accumulate high levels of potassium. High dietary levels of potassium have been associated with milk fever (hypocalcaemia).
- Greenfeed contains low levels of calcium. It is important to supplement cereal greenfeed rations with extra calcium to avoid milk fever problems in cows.
- There may be rodent problems in hay stacks of greenfeed when stored over the summer.
- Greenfeed can be stemmy. Crimping during swathing and grinding or bale processing may help to reduce feed wastage.
- Typically use a 2:1 or 3:1 mineral and add additional limestone if required.
- Example rations using cereal greenfeed are found in Appendix F.

Considerations/Precautions: Cereal Silage

- Same precautions as cereal greenfeed.
- Typically use a 2:1 or 3:1 mineral and add additional limestone if required.
- Example rations using cereal silage are found in Appendix G.

Considerations/Precautions: Cereal Straw

- Straw has low levels of protein and energy. It is less digestible than hay or greenfeed.
- A cow might consume 25 to 30 pounds of straw in a 24-hour period but the microbes in the rumen can only digest about 1.25 per cent of the cow's body weight as dry matter straw.
- Example: 1,400 lb. cow x 1.25 per cent = 17.5 lb. of dry matter straw per day, adjust for moisture content of straw (12 per cent moisture content or 88 per cent dry matter). 17.5 pounds divided

by 0.88 equals 20 pounds of straw (as fed) per day, maximum straw intake suggested.

- Impaction may occur if properly balanced rations are not provided.
- Ensure adequate levels of vitamin A are fed.
- Provide a good source of energy (grain or pellets).
- Ensure that adequate protein is supplemented.
- Generally, straw rations are not good rations for lactating cows. Use caution with other herd groups, depending on their condition.
- Typically use a 2:1 mineral and additional limestone if required.
- Example rations using cereal straw are found in Appendix H.

Considerations/Precautions: Clover Silage

- As with moldy sweet clover hay, moldy sweet clover silage can result in the formation of dicoumarol which causes bleeding diseases in cattle. Do not feed mouldy sweet clover silage to pregnant cows.
- Other types of clovers do not form dicoumarol.
- Typically use a 1:1 mineral.

Considerations/Precautions: Grass Hay

- Some grass hays can be dusty.
- Typically use a 2:1 mineral.
- Example rations using grass hay are found in Appendix I.

Considerations/Precautions: Lentil, Pea or Chickpea Hay

- Quality will be reflective of stage maturity and pod development in the crop.
- These forages are legumes containing good levels of calcium.
- These crops can be infected with various fungal diseases which can make the feeds dusty. Diseased crops do not contain toxins and are not harmful to the cows (other than being dusty

which might cause problems in the lungs).

- Typically use a 1:1 mineral.
- Example rations using lentil, pea or chickpea hay are found in Appendix J.

Considerations/Precautions: Lentil, Pea or Chickpea Straw

- Dry matter intakes are generally higher than cereal straw.
- Maximum daily intakes are approximately 1.6 per cent of the cow's body weight on a dry matter basis.
- Example: 1,400 lb. cow x 1.6 per cent = 22.4 lb. dry matter straw per day, adjust for moisture content of straw (12 per cent moisture content or 88 per cent dry matter), 22.4 pounds divided by 0.88 equals 25.5 pounds of straw (as fed) per day.
- This straw can be dirty and dusty. It is often stemmy with less leaf material than the same material cut as hay. Palatability may be less than desired. Grinding or processing this feed often increases consumption levels with less feed wastage.
- Typically use a 1:1 mineral.
- Example rations using lentil, pea or chickpea straw are found in Appendix K.

Considerations/Precautions: Slough Hay

- Often lower in protein and energy than grass hay.
- Usually provides adequate levels of nutrients to winter a pregnant cow.
- Cold weather and lactation rations always require additional grain or pellets.
- Watch for poisonous plants. Avoid grinding or processing bales if poisonous plants are a concern. Roll out those bales and allow cows to selectively eat the hay.
- Typically use a 2:1 mineral.
- Example rations using slough hay are found in Appendix L.

Appendix A - Average Values of Feeds and Supplements

Nutrient values of feeds and supplements used to develop the example beef cow rations. These are average values. A feed analysis will provide the actual nutrient value of a given feed and can be used to develop a more accurate ration.

	Dry Matter	DE	TDN	Protein	Ca	P	Mg	K	S
Feed Name	%	Mcal/lb.	%	%	%	%	%	%	%
Alf-Grass Hay	87.4	1.20	60.00	14.0	1.22	0.19	0.26	1.65	0.17
Canola Hay	85.0	1.21	60.40	15.1	1.16	0.27	0.39	1.64	0.55
Grass Hay	89.9	1.24	62.26	10.7	0.53	0.17	0.17	1.32	0.18
Cereal Greenfeed	85.8	1.17	58.40	10.9	0.36	0.21	0.24	1.89	0.23
Lentil Hay	85.7	1.18	59.00	14.2	1.28	0.23	0.36	1.28	0.14
Slough Hay	90.0	1.06	53.11	7.2	0.44	0.12	0.14	1.27	0.19
Canola Silage	35.0	1.12	56.34	16.2	1.29	0.33	0.45	2.16	0.55
Cereal Silage	39.2	1.23	61.67	11.0	0.37	0.25	0.22	1.64	0.19
Cereal Straw	89.1	0.90	45.04	4.2	0.17	0.09	0.14	1.45	0.12
Pea Straw	89.2	1.00	50.00	6.5	0.85	0.08	0.23	1.30	0.15
Barley	88.5	1.66	83.10	12.5	0.07	0.38	0.14	0.54	0.14
11% SCR Pell	90.0	1.43	71.65	12.2	0.20	0.78	0.17	0.33	0.14
32:11% Prot Supp	90.0	1.28	64.09	35.6	5.56	1.11	0.22	0.44	0.44
Alfa Suncure	90.0	1.24	62.13	16.6	1.52	0.20	0.29	1.62	0.21
Canola Meal	91.9	1.40	70.03	38.3	0.75	1.26	0.62	1.31	1.16
18:18 Mineral	99.0	0.00	0.00	0.0	18.18	18.18	0.00	0.00	0.00
19:9 Mineral	99.0	0.00	0.00	0.0	19.19	9.09	0.00	0.00	0.00
Limestone 1	99.0	0.00	0.00	0.0	38.38	0.00	0.00	0.00	0.00
TM Salt+SE	99.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00
ADE 10 M	99.0	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00

Appendix A - Average Values of Feeds and Supplements Continued

	Salt	Vit . A	Cu	Mn	Zn	Se	I
Feed Name	%	KIU/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Alf-Grass Hay	0.00	0	6	40	23	0.03	0.00
Canola Hay	0.00	0	3	45	25	0.03	0.00
Grass Hay	0.00	0	6	75	24	0.21	0.00
Cereal Greenfeed	0.00	0	6	38	26	0.03	0.00
Lentil Hay	0.00	0	7	46	29	0.03	0.00
Slough Hay	0.00	0	5	33	20	0.03	0.00
Canola Silage	0.00	0	3	45	25	0.03	0.00
Cereal Silage	0.00	0	5	36	25	0.03	0.00
Cereal Straw	0.00	0	3	30	16	0.03	0.00
Pea Straw	0.00	0	4	41	18	0.03	0.00
Barley	0.00	0	6	17	40	0.03	0.00
11% SCR Pell	0.00	0	6	17	40	0.03	0.00
32:11% Prot Supp	5.56	111	222	444	667	2.22	22.2
Alfa Suncure	0.00	0	5	37	21	0.03	0.00
Canola Meal	0.00	0	9	58	97	0.60	0.00
18:18 Mineral	0.00	505	3182	5303	10227	30.30	90.90
19:9 Mineral	0.00	505	505	4200	3030	30.00	90.90
Limestone 1	0.00	0	0	0	0	0.00	0.00
TM Salt+SE	97.47	0	2525	5051	7576	121.21	70.70
ADE 10 M	0.00	10101	5	20	20	0.01	0.00

Appendix B – Feed Management

It is always important to test your water and feed sources. Nutrient content of feedstuffs varies greatly based on season, agronomics and maturity. Additional minerals from livestock water sources can have significant impacts on health and performance. Lab analysis of both water and feed are critical steps in creating a balanced feed ration. Your nutritionist or local livestock and feed extension specialist are available to help ensure that your feed rations meet the animals' changing requirements.

Alternative Feed	Benefit	Concern	Recommendation
Ammoniated straw	Could increase protein digestibility.	Ammonia pockets could arise with improper application.	Anhydrous ammonia must be applied by a trained individual using safety equipment and specialized application tools.
Annual cereals	Feed value similar to good grass or grass/legume hay.	Potential for high levels of nitrates.	Cut oats at late milk stage. Cut barley, triticale and wheat at soft dough stage. Be aware protein content declines after early heading.
Brassicas (turnips, etc)	Good source of protein and rapid fall growth.	Bloat, sulphur and nitrates.	Introduce livestock gradually over three to five days. Ensure cattle have access to dry hay, straw or a similar roughage.
Canola meal	High protein and energy content.	Low in calcium and high in sulphur.	Ensure mineral program addresses any mineral imbalances.
Canola regrowth (grazing or hay)	At the late bloom, mid-podded stage, it is comparable to grass/alfalfa hay.	Potential for high levels of nitrates and sulphur.	Test the forage for sulphur and nitrate levels.
Canola seeds	High energy content.	High oil content.	Seed should be rolled prior to feeding and limited to 10 per cent or less of ration dry matter.
Cereal straw	Can help to extend your feed. Generally a cheap feed source.	High fibre, low quality and high risk of impaction.	Grinding or shredding can increase intake. Limit to 1.2 per cent of the animal's body weight. Supplement with energy, protein and minerals. Ensure in-crop treatments are compatible for livestock use.
Corn grazing	Great energy source and lower labour demands during feeding.	High phosphorus, acidosis risk and mycotoxins.	Feed test and ensure mineral program addresses any imbalances. Use fence to manage grazing, ideally into three-day allotments. Provide an alternative forage source; introduce them to field on a full rumen. If mature, gradually introduce and limit area to be grazed to ensure they graze the whole plant and avoid grazing of cobs alone.
Field peas	High protein and energy content.	Treated with seed treatments.	If greater than 25 per cent of the ration, the hull needs to be cracked. If treated, ensure to check label for feeding precautions.
Flax straw	Cost effective source of high fiber forage.	Impaction and prussic acid.	If possible, wait a couple years prior to feeding to improve palatability. Limit to less than 1.25 per cent of the animal's body weight.
Hailed out annual cereals	Feed value similar to good grass or grass/legume hay.	Nitrates, variable nutrient content and acidosis risk if mature.	Feed test and test for nitrate levels. Ensure mineral program addresses any mineral imbalances. If mature, limit intake and gradually introduce any increases in amounts.

Appendix B – Feed Management Continued

Alternative Feed	Benefit	Concern	Recommendation
Hay	If good quality, as determined through a feed test, it is often suitable to be the sole feed source.	Varied quality. Heating can reduce protein availability.	Feed test as quality varies widely. If heated, feed test to see how much protein is available.
Kochia	Nutrients could be similar to alfalfa hay if cut before plant is mature.	Oxalates, nitrates, laxative effects, bloat and sulphur.	Cut before flowering. Feed at no more than 25 to 30 per cent without a feed test. Do not graze pure kochia.
Mustard hay and silage	Good source of protein and energy for dry cows and bulls.	Nitrates, sulphur, palatability and high in moisture.	Include at no more than 40 to 50 per cent of the total feed intake. Crimping can decrease drying time.
Pelleted grain screenings	Can get them fortified with minerals and vitamins.	Ergot and weed seeds.	Test for mycotoxins. Compost resulting manure piles.
Treating straw with molasses	May improve palatability of straw.	Digestibility isn't increased. Potential for uneven application. Often need to supplement with additional minerals and vitamins, especially calcium.	Test for quality and supplement with good quality hay or grain and minerals/vitamins. Cattle can still only consume straw at 1.25 per cent of their body weight.
Feed grade urea	Alternative nitrogen source for ruminant animals.	May only be used to provide up to 30 per cent of daily protein requirements. Needs to be mixed thoroughly in complete diet. Not suitable for younger animals.	Amount to be used is dependent upon stage of production, size of animal and energy availability in diet; ranges from 0.05 to 0.25 pounds (25 to 110 grams) of urea per head per day.

For more information, contact the Agriculture Knowledge Centre at 1-866-457-2377.

Appendix C – Samples Rations Using Alfalfa - Grass Hay

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **alfalfa grass hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Alfalfa Grass Hay	16 lb.	9 lb.	10 lb.	30 lb.
Cereal Straw	16 lb.	18 lb.	15 lb.	
Barley Grain		4 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			5 lb.	
18:18 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.06 lb.	0.06 lb.	0.06 lb.	0.06 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	28.4 lb.	27.6 lb.	26.8 lb.	26.4 lb.
Average Daily Gain	0.3 lb.	0.3 lb.	0.3 lb.	0.8 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix C – Samples Rations Using Alfalfa - Grass Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **alfalfa grass hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Alfalfa Grass Hay	27 lb.	13 lb.	15 lb.	35 lb.
Cereal Straw	8 lb.	18 lb.	15 lb.	
Barley Grain		5 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			5 lb.	
18:18 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.06 lb.	0.06 lb.	0.06 lb.	0.06 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	30.9 lb.	32 lb.	30.2 lb.	30.8 lb.
Average Daily Gain	0.3 lb.	0.3 lb.	0.2 lb.	0.7 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix C – Samples Rations Using Alfalfa - Grass Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **alfalfa grass hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4**	5
Alfalfa Grass Hay	34 lb.	26 lb.	18 lb.	38 lb.	30 lb.
Cereal Straw		4 lb.	10 lb.		
Barley Grain	5 lb.	8 lb.	10 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)					8 lb.
18:18 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	34.4 lb.	33.6 lb.	33.7 lb.	3.7 lb.	33.6 lb.
Average Daily Gain	0.5 lb.	0.4 lb.	0.2 lb.	-0.2 lb.	0.3 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**This ration example is energy deficient and is not recommended. For demonstration purposes only.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix D - Samples Rations Using Canola Hay

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **canola hay** as the main feed ingredient. Due to the limitations of canola hay, noted previously in this document, it has been limited to 50 per cent or less of the diet in these rations.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5	6	7
Canola Hay	14 lb.	14 lb.	16 lb.	10 lb.	14 lb.	10 lb.	14 lb.
Cereal Straw	14 lb.	14 lb.	16 lb.	10 lb.	14 lb.	10 lb.	14 lb.
Cereal Greenfeed				10 lb.	4 lb.		
Grass Hay						10 lb.	4 lb.
Barley Grain	3 lb.						
Pelleted Grain Screenings (fortified with vitamins and minerals, Crude Protein 14% to 15%)		3 lb.					
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	31.2 lb.	31.2 lb.	32.2 lb.	33.2 lb.	32.2 lb.	30.2 lb.	32.2 lb.
Average Daily Gain	0.4 lb.	0.3 lb.	0.2 lb.	0.2 lb.	0.3 lb.	0.4 lb.	0.4 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix D - Samples Rations Using Canola Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **canola hay** as the main feed ingredient. Due to the limitations of canola hay, noted previously in this document, it has been limited to 50 per cent or less of the diet in these rations.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5	6	7
Canola Hay	19lb.	19 lb.	19 lb.	10 lb.	10 lb.	10 lb.	10 lb.
Cereal Straw	14 lb.	10 lb.	14 lb.	8 lb.	8 lb.	10 lb.	10 lb.
Cereal Greenfeed				10 lb.	10 lb.		
Grass Hay						8 lb.	8 lb.
Barley Grain	3 lb.				5 lb.		5 lb.
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)		6 lb.	3 lb.	6 lb.			
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	36.2 lb.	35.2 lb.	36.2 lb.	34.3 lb.	33.2 lb.	33.2 lb.	33.2 lb.
Average Daily Gain	0.3 lb.	0.4 lb.	0.2 lb.	0.3 lb.	0.3 lb.	0.2 lb.	0.4 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix D - Samples Rations Using Canola Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **canola hay** as the main feed ingredient. Due to the limitations of canola hay, noted previously in this document, it has been limited to 50 per cent or less of the diet in these rations.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5	6	7
Canola Hay	14 lb.	16 lb.	20 lb.	20 lb.	10 lb.	10 lb.	11 lb.
Cereal Straw	10 lb.	7 lb.	5 lb.	5 lb.	8 lb.	8 lb.	6 lb.
Cereal Greenfeed					10 lb.		
Grass Hay						10 lb.	11 lb.
Barley Grain	14 lb.			12 lb.	11 lb.	10 lb.	
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)		16 lb.	14 lb.				11 lb.
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone		0.13 lb.	0.13 lb.				0.13 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	38.2 lb.	39.4 lb.	39.4 lb.	37.2 lb.	39.2 lb.	39.4 lb.	38.2 lb.
Average Daily Gain	0.4 lb.	0.3 lb.	0.3 lb.	0.3 lb.	0.3 lb.	0.3 lb.	0.3 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix E - Samples Rations Using Canola Silage

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **canola silage** as the main feed ingredient. Due to the limitations of canola silage, noted previously in this document, it has been limited to 50 per cent or less of the diet in these rations.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Canola Silage	40 lb.	35 lb.	24 lb.	40 lb.
Cereal Straw	16 lb.	13 lb.	15 lb.	8 lb.
Barley Grain		3 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			6 lb.	5 lb.
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone			0.13 lb.	
Salt (Trace Mineralized)	0.06 lb.	0.06 lb.	0.06 lb.	0.06 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	28.5 lb.	26.7 lb.	27.5 lb.	25.8 lb.
Average Daily Gain	0.2 lb.	0.3 lb.	0.3 lb.	0.4 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix E - Samples Rations Using Canola Silage Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **canola silage** as the main feed ingredient. Due to the limitations of canola silage, noted previously in this document, it has been limited to 50 per cent or less of the diet in these rations.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Canola Silage	45 lb.	35 lb.	35 lb.	37 lb.	17 lb.
Cereal Silage			25 lb.		
Cereal Straw	14 lb.	12 lb.	10 lb.	14 lb.	14 lb.
Barley Grain	3.5 lb.	7 lb.			
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				6 lb.	12 lb.
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone				0.06 lb.	0.13 lb.
Salt (Trace Mineralized)	0.07 lb.	0.07 lb.	0.07 lb.	0.07 lb.	0.07 lb.
Vitamin A-D-E *	0.006 lb.	0.006 lb.	0.006 lb.	0.006 lb.	0.006 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	31.5 lb.	29.3 lb.	31.2 lb.	31.1 lb.	29.7 lb.
Average Daily Gain	0.3 lb.	0.3 lb.	0.3 lb.	0.2 lb.	0.2 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix E - Samples Rations Using Canola Silage Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **canola silage** as the main feed ingredient. Due to the limitations of canola silage, noted previously in this document, it has been limited to 50 per cent or less of the diet in these rations.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5***
Canola Silage	42 lb.	34 lb.	35 lb.	35 lb.	35 lb.
Cereal Silage	12 lb.		30 lb.	15 lb.	
Cereal Straw	4 lb.	10 lb.			6 lb.
Barley Grain	12 lb.	13 lb.	10 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				16 lb.	16 lb.
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone		0.06 lb.		0.25 lb.**	0.34 lb. **
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	33.1 lb.	32.6 lb.	33.1 lb.	33 lb.	32.5 lb.
Average Daily Gain	0.5 lb.	0.1 lb.	0.6 lb.	0.4 lb.	-0.2 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.

***This ration example is energy deficient and is not recommended. For demonstration purposes only.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every 3 days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix F - Samples Rations Using Cereal Greenfeed

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal greenfeed** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Cereal Greenfeed	16 lb.	8 lb.	10 lb.	32 lb.
Cereal Straw	16 lb.	19 lb.	16 lb.	
Barley Grain		4 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			5 lb.	
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.11 lb.	0.11 lb.	0.11 lb.	0.11 lb.
Salt (Trace Mineralized)	0.06 lb.	0.06 lb.	0.06 lb.	0.06 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	28.3 lb.	27.6 lb.	27.7 lb.	27.7 lb.
Average Daily Gain	0.2 lb.	0.2 lb.	0.3 lb.	0.8 lb.
Average Daily Gain	0.2 lb.	0.2 lb.	0.3 lb.	0.8 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix F - Samples Rations Using Cereal Greenfeed Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal greenfeed** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Cereal Greenfeed	29 lb.	15 lb.	17 lb.	34 lb.
Cereal Straw	6 lb.	15 lb.	12 lb.	
Barley Grain		5 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			6 lb.	
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.06 lb.	0.13 lb.	0.2 lb.	0.06 lb.
Salt (Trace Mineralized)	0.06 lb.	0.06 lb.	0.06 lb.	0.06 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	30.7 lb.	31.1 lb.	31.1 lb.	29.6 lb.
Average Daily Gain	0.2 lb.	0.2 lb.	0.3 lb.	0.3 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix F - Samples Rations Using Cereal Greenfeed Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal greenfeed** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1**	2	3	4	5
Cereal Greenfeed	36 lb.	34 lb.	26 lb.	20 lb.	31 lb.
Cereal Straw			4 lb.	6 lb.	
Barley Grain		5 lb.	8 lb.	12 lb.	
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)					8 lb.
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.13 lb.	0.13 lb.	0.16 lb.	0.23 lb.	0.28 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.009 lb.	0.009 lb.	0.009 lb.	0.009 lb.	0.009 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	31.3 lb.	34 lb.	33.4 lb.	33.6 lb.	34.3 lb.
Average Daily Gain	-0.8 lb.	0.2 lb.	0.2 lb.	0.4 lb.	0.2 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**This ration example is energy deficient and is not recommended. For demonstration purposes only.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix G - Samples Rations Using Cereal Silage

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal silage** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5**
Cereal Silage	35 lb.	30 lb.	30 lb.	45 lb.	70 lb.
Cereal Straw	15 lb.	15 lb.	12 lb.	10 lb.	
Barley Grain		2 lb.			
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			4 lb.		
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	27.5 lb.	27.2 lb.	26.4 lb.	26.9 lb.	27.8 lb.
Average Daily Gain	0.2 lb.	0.3 lb.	0.4 lb.	0.4 lb.	1.1 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Moisture content may limit expected feed intake; actual gain may not be as suggested.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix G - Samples Rations Using Cereal Silage Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal silage** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4**
Cereal Silage	35 lb.	50 lb.	50 lb.	75 lb.
Cereal Straw	15 lb.	8 lb.	8 lb.	
Barley Grain	4 lb.	3 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			3 lb.	
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.13 lb.	0.13 lb.	0.16 lb.	0.13 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	31 lb.	29.8 lb.	29.8 lb.	29.8 lb.
Average Daily Gain	0.3 lb.	0.4 lb.	0.4 lb.	0.7

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Moisture content may limit expected feed intake; actual gain may not be as suggested.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix G - Samples Rations Using Cereal Silage Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal silage** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Cereal Silage	65 lb.	55 lb.	40 lb.	50 lb.	35 lb.
Cereal Straw		5 lb.	10 lb.	4 lb.	8 lb.
Barley Grain	7.0 lb.	8.0 lb.	10.5 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				11 lb.	15 lb.
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.19 lb.	0.19 lb.	0.19 lb.	0.31 lb. **	0.44 lb. **
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.009 lb.	0.009 lb.	0.009 lb.	0.009 lb.	0.009 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	32.1 lb.	33.5 lb.	34.3 lb.	33.6 lb.	35 lb.
Average Daily Gain	0.3 lb.	0.3 lb.	0.3 lb.	0.2 lb.	0.3 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

***Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix H - Samples Rations Using Cereal Straw

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal straw** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Cereal Straw	22 lb.	22 lb.	22 lb.	20 lb.	20 lb.
Barley Grain	8 lb.	8 lb.	6.5 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				10 lb.	10 lb.
32% Protein Supplement	1.0 lb.			1.0 lb.	
Canola Pellets or Canola Meal		1.0 lb.			0.5 lb.
Suncure Alfalfa Pellets or Cubes			3.0 lb.		
19:9 Mineral (2:1)	-	0.13 lb.	0.13 lb.	-	0.13 lb.
Limestone	0.13 lb.	0.13 lb.	0.13 lb.	0.25 lb.**	0.38 lb.**
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	-	0.005 lb.	0.005 lb.	-	0.005 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	27.8 lb.	28 lb.	28.4 lb.	28.1 lb.	27.9 lb.
Average Daily Gain	0.4 lb.	0.4 lb.	0.4 lb.	0.4 lb.	0.3 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix H - Samples Rations Using Cereal Straw Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal straw** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Cereal Straw	22 lb.	22 lb.	21 lb.	20 lb.	21 lb.
Barley Grain	11 lb.	11 lb.	9 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				13.5 lb.	13.5 lb.
32% Protein Supplement	1.25 lb.			1.5 lb.	
Canola Pellets or Canola Meal		1.25 lb.			
Suncure Alfalfa Pellets or Cubes			4.0 lb.		
19:9 Mineral (2:1)	-	0.13 lb.	0.13 lb.	-	0.13 lb.
Limestone	0.13 lb.	0.25 lb.**	0.13 lb.	0.25 lb.**	0.38 lb.**
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	-	0.005 lb.	0.005 lb.	-	0.005 lb.
Vitamin E 50,000 IU/Kg	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.	0.013 lb.
Dry Matter Intake	30.7 lb.	30.9 lb.	30.8 lb.	31.7 lb.	31.3 lb.
Average Daily Gain	0.4 lb.	0.4 lb.	0.3 lb.	0.3 lb.	0.2 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix H - Samples Rations Using Cereal Straw Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **cereal straw** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Cereal Straw	18 lb.	18 lb.	18 lb.	12 lb.
Grass Hay				12 lb.
Barley Grain	17 lb.	17 lb.	14 lb.	
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				15 lb.
32% Protein Supplement	1.6 lb.			
Canola Pellets or Canola Meal	1.0 lb.	2.5 lb.		
Suncure Alfalfa Pellets or Cubes			6 lb.	
19:9 Mineral (2:1)	-	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.25 lb.**	0.38 lb.**	0.13 lb.	0.38 lb.**
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	-	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	33.8 lb.	34 lb.	34.1 lb.	35.6 lb.
Average Daily Gain	0.2 lb.	0.3 lb.	0.2 lb.	0.2 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix I - Samples Rations Using Grass Hay

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **grass hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Grass Hay	15 lb.	10 lb.	10 lb.	18 lb.	30 lb.
Cereal Straw	15 lb.	18 lb.	18 lb.	12 lb.	
Barley Grain		3 lb.			
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)			3 lb.		
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone			0.06 lb.		
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	27.1 lb.	27.9 lb.	28 lb.	27.1 lb.	27.2 lb.
Average Daily Gain	0.2 lb.	0.4 lb.	0.3 lb.	0.4 lb.	1.1 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix I - Samples Rations Using Grass Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **grass hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Grass Hay	10 lb.	18 lb.	10 lb.	23 lb.	19 lb.
Cereal Greenfeed		15 lb.			
Cereal Straw	16 lb.		15 lb.	6 lb.	9 lb.
Barley Grain			4 lb.		4 lb.
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)	8 lb.			3 lb.	
Suncure Alfalfa Pellets or Cubes			4 lb.		
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone	0.19 lb.				
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	30.9 lb.	29.3 lb.	29.7 lb.	29 lb.	28.9 lb.
Average Daily Gain	0.2 lb.	0.5 lb.	0.2 lb.	0.4 lb.	0.4 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix I - Samples Rations Using Grass Hay

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **grass hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5	6
Grass Hay	28.5 lb.	22 lb.	15 lb.	20 lb.	25 lb.	16 lb.
Cereal Greenfeed						14 lb.
Cereal Straw		5 lb.	10 lb.	5 lb.		
Barley Grain	6 lb.	8 lb.	12 lb.			6 lb.
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				11 lb.	10 lb.	
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone		0.06 lb.	0.13 lb.	0.25 lb.**	0.22 lb.	0.06 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	31.2 lb.	31.6 lb.	33.4 lb.	32.8 lb.	31.9 lb.	36.3 lb.
Average Daily Gain	0.3 lb.	0.2 lb.	0.4 lb.	0.2 lb.	0.3 lb.	0.3 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix J - Samples Rations Using Pea, Chickpea or Lentil Hay

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

***Protein levels in pea, chickpea or lentil hay are extremely variable. Feed testing is required.*

Following are example rations using **pea, chickpea or lentil hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5	6
Pea or Lentil Hay	20 lb.	14 lb.	14 lb.	29 lb.	26 lb.	34 lb.
Cereal Straw	13 lb.	16 lb.	16 lb.	5 lb.	5 lb.	
Barley Grain		3 lb.			3 lb.	
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude	6 lb.	8 lb.	12 lb.			6 lb.
Protein 11% to 12%)			3 lb.			
18:8 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.08 lb.	0.08 lb.	0.08 lb.	0.08 lb.	0.08 lb.	0.08 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Dry Matter Intake	28.9 lb.	29.1 lb.	29.2 lb.	29.5 lb.	29.6 lb.	29.4 lb.
Average Daily Gain	0.2 lb.	0.4 lb.	0.3 lb.	0.6 lb.	0.8 lb.	0.7 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix J - Samples Rations Using Pea, Chickpea or Lentil Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

***Protein levels in pea, chickpea or lentil hay are extremely variable. Feed testing is required.*

Following are example rations using **pea, chickpea or lentil hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Pea or Lentil Hay	17 lb.	17 lb.	32 lb.	28 lb.	38 lb.
Cereal Straw	13 lb.	13 lb.	5 lb.	5 lb.	
Barley Grain	5 lb.			4 lb.	
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude	6 lb.	8 lb.	12 lb.		
Protein 11% to 12%)		6 lb.			
18:8 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.08 lb.	0.08 lb.	0.08 lb.	0.08 lb.	0.08 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Dry Matter Intake	32.5 lb.	32.6 lb.	32.1 lb.	32.2 lb.	32.8 lb.
Average Daily Gain	0.2 lb.	0.2 lb.	0.2 lb.	0.6 lb.	0.5 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix J - Samples Rations Using Pea, Chickpea or Lentil Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

***Protein levels in pea, chickpea or lentil hay are extremely variable. Feed testing is required.*

Following are example rations using **pea, chickpea or lentil hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5
Pea or Lentil Hay	31 lb.	27 lb.	16 lb.	30 lb.	19 lb.
Cereal Straw		3 lb.	8 lb.		5 lb.
Barley Grain	8 lb.	9 lb.	14 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				9 lb.	15 lb.
18:8 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	
19:9 Mineral (2:1)					0.13 lb.
Salt (Trace Mineralized)	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.1 lb.
Vitamin A-D-E *	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	33.9 lb.	34 lb.	33.5 lb.	34.1 lb.	34.5 lb.
Average Daily Gain	0.1 lb.	0.1 lb.	0.3 lb.	0 lb.	0.1 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix K - Samples Rations Using Pea, Chickpea or Lentil Straw

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

***Protein levels in pea, chickpea or lentil hay are extremely variable. Feed testing is required.*

Following are example rations using **pea, chickpea or lentil straw** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3
Pea or Lentil Straw	24 lb.	24 lb.	16 lb.
Cereal Greenfeed			16 lb.
Barley Grain	6 lb.		
Pelleted Grain Screenings (not fortified with vitamins			
or minerals, Crude Protein 11% to 12%)		7 lb.	
18:18 Mineral (1:1)	0.13 lb.	0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.08 lb.	0.08 lb.	0.08 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.01 lb.	0.01 lb.	0.01 lb.
Dry Matter Intake	26.9 lb.	27.9 lb.	28.2 lb.
Average Daily Gain	0.5 lb.	0.4 lb.	0.4 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix K - Samples Rations Using Pea, Chickpea or Lentil Straw Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

***Protein levels in pea, chickpea or lentil hay are extremely variable. Feed testing is required.*

Following are example rations using **pea, chickpea or lentil straw** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late-Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3
Pea or Lentil Straw	24 lb.	24 lb.	16 lb.
Cereal Greenfeed			16 lb.
Barley Grain	10 lb.		5 lb.
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)		11 lb.	
18:18 Mineral (1:1)	0.13 lb.		
19:9 Mineral (2:1)		0.13 lb.	0.13 lb.
Salt (Trace Mineralized)	0.08 lb.	0.08 lb.	0.08 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.01 lb.	0.01 lb.	0.01 lb.
Dry Matter Intake	30.5 lb.	31.5 lb.	32.6 lb.
Average Daily Gain	0.5 lb.	0.4 lb.	0.7 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix K - Samples Rations Using Pea, Chickpea or Lentil Straw Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

***Protein levels in pea, chickpea or lentil hay are extremely variable. Feed testing is required.*

Following are example rations using **pea, chickpea or lentil straw** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5	6	7
Pea or Lentil Straw	19 lb.	19 lb.	19 lb.	16 lb.	16 lb.	16 lb.	13 lb.
Cereal Greenfeed							13 lb.
Barley Grain	17 lb.	16 lb.	16 lb.				12 lb.
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				20 lb.	19 lb.	19 lb.	
32% Protein Supplement	1.25 lb.			1.0 lb.			
Canola Pellets or Canola Meal		2.0 lb.			2.0 lb.		
Suncure Alfalfa Pellets or Cubes			2.5 lb.			2.5 lb.	
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone		0.06 lb.			0.25 lb.**	0.25 lb.**	0.06 lb.
Salt (Trace Mineralized)	0.06 lb.	0.09 lb.	0.09 lb.	0.06 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.005 lb.	0.01 lb.	0.01 lb.	0.005 lb.	0.01 lb.	0.01 lb.	0.01 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	33.1 lb.	33.2 lb.	33.6 lb.	33.4 lb.	33.7 lb.	34.1 lb.	33.7 lb.
Average Daily Gain	0.4 lb.	0.4 lb.	0.4 lb.	0.1 lb.	0.1 lb.	0.1 lb.	0.2 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

***Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix L - Samples Rations Using Slough Hay

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **slough hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Mid-Pregnancy – Early Winter Conditions**

- no wind, -10 C
- six months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4	5**
Slough Hay	28 lb.	20 lb.	25 lb.	16 lb.	28 lb.
Cereal Straw		5 lb.	2 lb.	10 lb.	
Barley Grain	2 lb.		3 lb.		
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)				6 lb.	
32% Protein Supplement		1 lb.			
Suncure Alfalfa Pellets or Cubes		4 lb.			
19:9 Mineral (2:1)	0.13 lb.	-	0.13 lb.	0.13 lb.	0.13 lb.
Limestone				0.06 lb.	
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.	0.004 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	27.2 lb.	27.1 lb.	27.2 lb.	28 lb.	25.4 lb.
Average Daily Gain	0.4 lb.	0.2 lb.	0.4 lb.	0.3 lb.	-0.2 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

***This ration example is energy deficient and is not recommended. For demonstration purposes only.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix L - Samples Rations Using Slough Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **slough hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Late Pregnancy – Winter Conditions**

- no wind, -20 C
- eight months pregnant
- to start calving April 1
- expected calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Slough Hay	22 lb.	17 lb.	20 lb.	15.5 lb.
Cereal Greenfeed		10 lb.		
Cereal Straw			5 lb.	8 lb.
Barley Grain	5 lb.		6 lb.	
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)		6 lb.		10 lb.
Canola Pellets or Canola Meal			1.5 lb.	
Suncure Alfalfa Pellets or Cubes	5 lb.			
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	0.13 lb.
Limestone		0.13 lb.		0.22 lb.
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.005 lb.	0.005 lb.	0.005 lb.	0.005 lb.
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	29 lb.	29.6 lb.	29.6 lb.	30.5 lb.
Average Daily Gain	0.3 lb.	0.3 lb.	0.3 lb.	0.2 lb.

**The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.*

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Appendix L - Samples Rations Using Slough Hay Continued

** These rations are meant to be used as examples/guides. They have been formulated using average feed values and the parameters noted below. There may be differences in intake and gain depending on actual situations. To develop more accurate rations for your herd, consult a nutritionist or livestock and feed extension specialist.*

Following are example rations using **slough hay** as the main feed ingredient.

Parameters:

1,400 lb. Cow **Lactating – Early Spring Conditions**

- no wind, -5 C
- first month of lactation
- fourth lactation
- calf birth weight 95 lb.

All amounts are per cow per day on an as fed basis.

Feedstuff	1	2	3	4
Slough Hay	23 lb.	20 lb.	15 lb.	18 lb.
Cereal Greenfeed			12 lb.	
Cereal Straw				5 lb.
Barley Grain	14 lb.		10 lb.	12 lb.
Pelleted Grain Screenings (not fortified with vitamins or minerals, Crude Protein 11% to 12%)		14 lb.		
32% Protein Supplement				1.5 lb.
Suncure Alfalfa Pellets or Cubes		4 lb.		
19:9 Mineral (2:1)	0.13 lb.	0.13 lb.	0.13 lb.	-
Limestone	0.13 lb.	0.25 lb.**	0.13 lb.	
Salt (Trace Mineralized)	0.09 lb.	0.09 lb.	0.09 lb.	0.09 lb.
Vitamin A-D-E *	0.009 lb.	0.009 lb.	0.009 lb.	-
Vitamin E 50,000 IU/Kg	0.02 lb.	0.02 lb.	0.02 lb.	0.02 lb.
Dry Matter Intake	33.4 lb.	34.7 lb.	33 lb.	32.7 lb.
Average Daily Gain	0.3 lb.	0.1 lb.	0.2 lb.	0.1 lb.

*The vitamin A-D-E pre-mix used in these rations contains 10,000,000 IU's of vitamin A per Kg.

**Using a Total Mixed Ration (TMR) in situations where extra limestone is required can help ensure intake is achieved. Recommended limestone intake may not be possible with free choice delivery method. It is critical to ensure adequate calcium intake (mineral and limestone) in order to maintain the minimum calcium to phosphorus ratio.

- Salt can be fed free-choice. Consumption should average about one to 1.5 ounces per head per day.
- If feeding more than eight pounds of total concentrate per cow per day, it is advised to divide the concentrate and feed equal portions twice per day.
- When starting cattle on grain, work up slowly to the full amount in the ration (i.e. start at three pounds per head per day and increase by one to two pounds every three days until the full amount is reached).
- The minimum amount of mineral recommended is two ounces per head per day unless adequate mineral is supplied either in fortified pellets or fortified protein supplements.

Ration Prep Worksheet

Date: _____ RM Number: _____

Producer/Farm Name: _____ Email: _____

Phone: _____ Premises Identification (PID) Number: SK _____

	Total Number	Breed	Average Weight (in lb)	Average Body Condition Score (1-5)	Maintain or Gain Weight (ADG for feeders)	Rumensin (Yes or No)	Grouped Separate from Mature Cows (Yes or No)
Old/Thin cows							
Mature cows							
Bred Heifers/2nd calvers							
Open Repl. Heifers (target 65% of mature weight at breeding)							
Feeders Steers							
Feeder Heifers							
Other (ie. herd bulls)							

Date you expect to start feeding: _____ Predicted number of days on feed: _____

Have your calves been weaned? Yes No

If 'No', please indicate when you plan to wean _____

What is your calving start date? Cows: _____ Heifers: _____

What is the average expected calf birth weight? Cows: _____ Heifers: _____

Have you recently tested your water? Yes No

If 'Yes', please provide a copy of your analysis if available, or not already on file.

Are there any special directions or considerations this year (ie. decreased conception rates, less than ideal harvest conditions, etc.) that we should discuss before building the ration? Describe briefly, below.

	Description	Amount	Weight & Unit	Price	Year Made	Feed Test (Yes or No)	Comments/Concerns
ex. Hay	Yard Alfalfa-Brome	150 bales	1,400 lb	\$0.06/lb.	2020	Yes	From last season, must use up first
Hay							
Hay							
Green-feed							
Straw							
Straw							
Grain							
Grain							
Pellets							Please provide product tag
Silage							
Silage							
Supp							Please provide product tag
Mineral							Please provide product tag
Salt							Please provide product tag

Describe your usual feeding program, and if currently feeding, the ration the cattle are currently on. How is feed delivered? (bales in bale feeders, bales rolled out or shredded, TMR). Is mineral provide free choice?

This information is necessary to develop a ration specific to your livestock needs. Contact the Agriculture Knowledge Centre at 1-866-457-2377 or your local livestock and feed extension specialist for more information.