Manitoba Agriculture and Food
Agriculture et Alimentation Manitoba

Manitoba Beef Review

Volume 2, Issue 2 *Manitoba Agriculture and Food - Animal Industry Branch* *Fall 2002*

Straw as an Alternative Roughage Source for Wintering Beef Cows

By: John Popp, Beef Specialist, Southwest Region & Melinda German, Provincial Cow/calf Specialist

When hay supplies are low, differing options for wintering the cow herd have to be considered. Straw can be used extensively as winter feed if energy, protein, mineral and vitamin requirements are met. Straw does not contain sufficient levels of these nutrients and the use of grain, protein supplements, mineral/vitamin premixes is needed to make straw-based wintering diets work well. It is critical to supply all the nutrients the animals need in order for them to maintain good health, body condition, high reproductive rates and desirable weaning weights. It is important to understand the basic nutritional needs of your animals. The nutritional requirements of the beef herd change as the animals move through different physiological stages.

The general nutritional requirements of the breeding herd are listed in Table 1. When comparing the nutrient requirements of the breeding herd to the nutritive value of straw (Table 2) it is clear that straw alone is not sufficient to maintain the animals.

Table 1: Nutritional Requirements of the Breeding Herd[1]

Class	TDN %	CP %	Ca %	P %
Mature cows				
Mid gestation	50-53	7	0.20	0.20
Late gestation	58	9	0.28	0.23
Lactating	60-65	11-12	0.30	0.26
Replacement Heifers	60-65	8-10	0.30	0.22
Breeding Bulls	48-50	7-8	0.26	0.20
Yearling Bulls	55-60	7-8	0.23	0.23

[1] Nutritional requirements vary with body weight, frame size, predicted ADG and stage of production. Contact your local Ag. Office for ration formulation services. All rations must be balanced for protein, energy, vitamins and minerals.

Physical intake of a straw based ration will be restricted due to the fibrous nature of the feed. This can create problems, particularly when beef cows increase intake in response to cold temperatures. Rumen compaction may occur if straw is fed alone with no readily available energy and/or protein supply for the rumen microbes.

Table 2: Average Nutrient Values of Straw (100% Dry Matter Basis)

	CP %	TDN %	Ca %	P %
Wheat Straw	3.9	44	0.18	0.11
Barley Straw	4.9	46	0.13	0.08
Oat Straw	4.5	48	0.26	0.10
Flax Straw	5.4	43	0.26	0.08
Pea Straw	6.4	48	0.60	0.19

During cold periods the energy component of the ration needs to increase approximately 15-20% as the ambient temperature drops to -20 to - 25 ^{0}C. In the last trimester of pregnancy the cows

nutrient requirements also increase significantly. Therefore, it is important to provide higher quality feed either in the form of good quality alfalfa hay or increase protein and energy supplementation of straw diets.

When feeding straw several factors need to considered:
1) Feed test - straw sources (i.e. barley versus wheat straw) differ in nutritional content and digestibility. It is critical to know the nutrient content of all feedstuffs in order to provide a balanced ration.
2) Diets must be balanced for energy, protein, minerals and vitamins.
3) Ammoniation can increase the overall feeding value and intake of straw based diets.
4) Grinding/chopping straw and feeding as a part of a total mixed rations will increase intakes.
5) Check nitrate content.
6) A 2:1 mineral (or 3:1) will be needed. Limestone may also be required if no other forage is fed.

Here are some different options (Table 3) for feed rations using values of $80/ton for hay, $60/ton for greenfeed, $190/ton for 20% CP grain screenings (77%TDN), $25/ton for straw, $45/ton for ammoniated straw, $3.60/bushel on barley, $280/ton for 32-10 feedlot supplement, $650/ton for mineral, $45/ton barley silage (35% dry matter), $45/ton for corn silage (30% dry matter) and $8.50/bale treating bales with liquid feed supplement (4.5-5 gallons/bale). Based on a 1400-1450 lb cow – approximate feed required pre/post lactation calving in March.

Table 3: Differing wintering ration options for beef cows (1400-1450 lbs)*

Option	1	2	3	4	5	6	7	8
Grass-legume hay (lbs)	16	14	-	-	-	-	-	9
Barley straw (lbs)	23	-	23	23	-	22	23	18
Ammoniated barley straw (lbs)	-	-	-	-	30	-	-	-
Barley grain (lbs)	1.5	-	10	10	7.5	-	-	-
32-10 Feedlot supplement (lbs)	0.5	-	1.5	-	-	0.5	-	1
Barley silage (lbs)	-	-	-	-	-	45	-	-
Corn silage (lbs)	-	-	-	-	-	-	-	32
Liquid supplement (lbs)	-	-	-	2.9	-	-	-	-
2:1 mineral	-	0.15	-	-	0.1	-	-	-
20% Screening pellets	-	-	-	-	-	-	14	-
Greenfeed	-	19	-	-	-	-	-	-
Cost ($)/head/day	**1.11**	**1.18**	**1.25**	**1.41**	**1.32**	**1.36**	**1.62**	**1.33**

*add 5%- 10% for waste depending on feeding method

In conclusion, the first step is to do an inventory of available feed supplies and feed test. This allows you to match feed available with the animal's requirements. Contact your local Manitoba Agriculture and Food office for feed testing supplies, feed sample submission and ration formulation.

Additional Links and Related Information:

Winter Rations For Beef Cows
http://www.gov.mb.ca/agriculture/livestock/beef/baa01s12.html

Feeding Fusarium Contaminated Grains to Livestock
http://www.gov.mb.ca/agriculture/livestock/nutrition/bza00s01.html

Ammoniation of Forages
http://www.gov.mb.ca/agriculture/crops/forages/bjb00s09.html

Early Weaning of Calves an Option during Periods of Drought

By: Melinda German, Provincial Cow/calf Specialist

Beef cows are amazing mothers, especially during periods of drought. The cow will sacrifice her body condition and ultimately next year's reproductive performance by continuing to produce milk even when pasture quality and/or quantity is too low to support her basic maintenance requirements. Early weaning of the calves can alleviate some of the nutritional pressure on the cow, allowing her to remain on pasture longer, improve her body condition and ensure high rates of reproductive performance.

Normally, beef calves are weaned at 6-7 months of age. However, several studies have indicated that calves weaned as early as 2 months of age can perform well in terms of gain and overall performance when fed well balanced diets, meeting the animals needs.

Early weaning can range from 1-5 months and when pasture is scarce due to drought weaning at 3-5 months of age is a viable option to lower the cow's requirements and put less pressure on the pasture. Over-stressed pastures not only take longer to recover but also the plants are less vigorous and undesirable plants can invade your pastures.

Even though early weaning is a viable option, there are several management decisions a producer must consider.
1) Once weaned will the calves be sold directly off the cow, backgrounded or will you retain ownership?
2) Availability of feed if the calves are not sold.
3) Calves should be castrated, dehorned and vaccinated 10-14 days prior to weaning. Consult your local herd veterinarian.
4) Offer creep feed to the calves prior to weaning to allow them to adapt.

Advantages of Early Weaning

- Lower nutritional requirements for cows/heifers on pasture
- Improved body condition score and subsequent reproductive performance of cows and first calf heifers
- Extend the grazing period on pasture (and allow for improved grazing management)
- Improved efficiency of gain for early weaned calves

Disadvantages of Early Weaning

- Higher labour requirements
- Facilities and feed required for early weaned calves
- Early weaned calves can be more susceptible to stress and related health problems, especially if proper nutrition and management practices are not adhered to
- Early weaned calves may have lower carcass weights or become fatter at lighter weights

Overall, early weaning of beef calves is a viable option particularly during periods of low quality and quantity of feed on pasture. For more information and/or assistance with ration formulation please contact your local Ag. Office.

Additional Link

Livestock Management - Creep Feeding and Early Weaning
http://www.gov.mb.ca/agriculture/news/topics/daa40d01.html

Beef - Weaning Stress

By: Gerry Orr - Beef Specialist - Central Region

They say change is stress. For a calf, weaning time must be stressful, because their day to day experience sure changes. Recent studies are measuring what has often been observed - but not measured.

We observe or notice that calves weaned and moved to a feedlot spend a lot of their time walking and bawling. Research trials at U. of Saskatchewan now show how far those calves walk and how much time they spend bawling or lying down. Dr. Stookey also went further and measured blood samples from different trial groups to gain insight to possible disease resistance. There have also been studies in the U.S.A. which record animal behaviour before, during and after weaning.

There are several methods of weaning beef calves:

1. A typical weaning method is to round up cow/calf pairs and either move the calves to a dry lot or ship them direct to market (then to dry lot)
2. A variation of the above method is to provide “trainer” cows or yearlings to help teach newly weaned/arrived calves at the feedlot to find and use the water and feed sources and thereby reduce walking/bawling/sickness.
3. A similar method is to roundup and separate cows and calves by a fence so that they are still in contact by sound/sight and still have contact yet not able to suckle.
4. Operators also can bring cow/calf pairs to a central penned location with pasture or hay (feed) available with water. Pairs remain together for several days to acclimatize calves and then cows are removed to a different area.
5. Using a new trial for an old method, Dr. Stookey at the U. of S. placed nose pads on a group of calves to prevent suckling and left cow/calf pairs together for several days. He compared their behaviour to calves weaned conventionally.

In Dr. Stookey’s Saskatchewan trials, they were interested in calf behaviour under the different weaning methods. Over several years they have observed weaned calves with trainer cows; using both non connected (cull) cows and also splitting cows, ie. one original group and switching “familiar” cows; neither system reduced the amount of walking or bawling. While observing the weaning by “fence line separation” they found it reduced the time calves spent walking and bawling as compared to “cold turkey” separation, but it was not much reduction.

In order to allow normal social contact between the cow and calf yet prevent suckling; they tried using nose pads on the calves. The trial lasted four days followed by physical separation. This ‘two step’ weaning resulted in:

a) 85 percent less bawling
b) 80 percent less distance walked
c) 25 percent more time feeding

To me an interesting measurement was on the behaviour of the conventional weaned calves;

a) Calves bawled roughly 800 times daily for the first two days then quieted down to less that 200 times daily for the next two days.
b) They walked 40.5 km (25.2 miles) per day for two days. The next 2 days they backed off to roughly 8 kms which was then comparable to pre-weaning or the ‘two step’ weaned calves.

When calves bawl and walk constantly they raise dust and irritate throats. They are not resting or eating enough - and that stress will pre dispose them to reduced gain and increased chance of illness.

The ‘two step’ system is inconvenient but the trial shows there is a way to reduce stress. We always knew weaned calves and cows bawled a lot and calves initially tended to walk rather than eat, drink, and/or rest. Now we have some numbers to work with.

Nose pads cost roughly $ 8.00 each and availability is limited. For retained ownership back grounding or special calves, this weaning method has an application. Initial first week weight gains favour the ‘two step’ system - but over the feeding period conventional and ‘two step’ methods tend to even out.

The Riparian Health Initiative

By: Melanie Dubois-Claussen - Manitoba Habitat Heritage Corporation

With grazing livestock and environmental management, producer experiences across the prairies seem to be showing that there is the potential for "win-win-win" outcomes - land use approaches that improve the environment, improve water quality and improve producer incomes. This is leading to new levels of cooperation among agriculture and conservation organizations to find long-term, sustainable solutions.

One group that has followed these results closely is the Manitoba Cattle Producers Association. The MCPA led a consultation with agricultural and conservation interests to better understand how cooperative, producer-friendly programs for riparian and associated land in Agro-Manitoba could be expanded.

Those consultations showed that the main barriers to cooperative riparian initiatives were funding and lack of coordination among agencies that were able to assist producers. Better information on riparian and water quality issues was also required. Consultations led to the development of the Riparian Health Initiative, a partnership to increase coordination and effectiveness of stewardship and extension initiatives for producers across Agro-Manitoba. With funding from the federal government's new Agricultural Environmental Stewardship Initiative, the Manitoba Rural Adaptation Council (MRAC) provided $600,000 over three years to improve coordination and support delivery of the Riparian Stewardship Program across Agro-Manitoba.

The emerging Riparian Health Council (RHC) will ensure ongoing interaction and coordination of groups involved with riparian initiatives. It is chaired by the MCPA and includes representation from industry, government and conservation agencies. One of the first tasks is to improve coordination of existing activities. Better information on riparian issues is also needed. Regional teams have been established to improve communication and coordination of partners at local levels. The bulk of MRAC funds will go to producers for managed grazing projects and forage buffer strips along permanent waterways. MHHC, PFRA, and MAF are delivering the program but additional partners will likely become involved in different regions.

All the partners of the Riparian Health Initiative want to ensure more effective programs that help producers with the adjustment to more sustainable land use practices. Issues in the agricultural landscape are much broader than grazing livestock or how riparian and associated lands are used. According to Garth Routledge, the president of the Cattle Producers Association "The greatest accomplishment we could make would be to demonstrate that cooperative, producer-friendly approaches really are the best way to go for all land use issues. 'Win-win-win' can be achieved."

Riparian Health Program Incentives

Assistance and Incentives

*Cost/shared fencing of riparian and associated lands - maximum of $2,500
*Assistance to explore off-site watering options
*Payment of $30/acre to establish forage buffers zones on cultivated lands adjacent to permanent waterways
*Recognition for cooperating landowners

Eligibility Criteria

*Eligible sites must be riparian areas (along permanent waterways or lakeshores) under permanent cover, preferably native vegetation

Landowner Benefits

*Opportunity to make riparian area conservation part of a managed grazing system that can improve pasture production
*Opportunity for cleaner water supply and better herd health
*Recognition for sound land stewardship

Interested landowners are invited to contact MHHC offices in Killarney (523-5250), Minnedosa (867-5245), Reston (877-3162) or Beausejour (268-3233) or Manitoba Agriculture in Portage la Prairie (239-3353)

What to Do with Sprouted Grains?

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John Popp, Regional Livestock specialist
Melinda German, Provincial Cow/calf specialist
Lyle McNichol, Regional Livestock specialist

Wet and humid weather during the harvest season can result in an abundance of sprouted grain available to the livestock feeding industry. Feeding trials with beef cattle, pigs and poultry show that **sprouting has no effect on feeding value**. Data from Alberta and various American universities shows the performance of livestock fed sprouted grains is similar to that of livestock fed non-sprouted grains albeit, some reduction in intake of sprouted grain can be observed. Thus, it may be advisable to blend in sprouted grains in finishing rations; when feeding to cows or backgrounding calves; this should not be an issue.

Due to the higher moisture content of sprouted grain, spoilage and mold growth may occur during storage. Suspect grain should be checked for molds and not fed to young or pregnant/lactating animals.

Options for effective storage include:

1. Aerating the grain. This is the best option for optimum quality and minimal storage losses. Dry grain to 18% moisture. Moisture tests off the field can be somewhat erroneous and variation in moisture is possible, depending on the degree of sprouting. Grain storage researchers at North Dakota State University suggest that 1 to 1.5% moisture should be added to actual moisture reading of sprouted grain.
2. If approaching 20% moisture, field storage is strongly recommended, rather than placing grain in steel bins. Try to turn grain with the use of augers. Also, if possible place aeration vents in field stored grain and maintain air circulation through grain. Environmental temperature is a big factor; outside stored grain at 60 ^{0}F can easily store for 75 days, however, if temperature rises to 70 ^{0}F storage life drops to 30 to 45 days.

3. Ensiling grain in conventional silos or commercial silage bags. For best results with ensiling, the **grain needs to be rolled or ground before being placed in a bunk or vertical silo**. If it is not processed, excess oxygen will be trapped in the grain and spoilage will be substantial. Grain going into an oxygen limiting silo does not need to be ground. **Moisture content should be a uniform 23-35% for good ensiling.** Grain that is drier than this will not ensile well and storage losses can be significant. Uniform moisture content may be a problem with sprouted grain. **Good silage making practices need to be practiced (covering, packing, proper feedout etc.)**
4. Treating with a preservative (propionic acid, ammonia). Propionic acid seems to be the preservative of choice although there are reports of ammoniation working well. The amount of acid depends on grain moisture content, length of storage desired and the temperature. As a guideline, grain with 30% moisture is treated with 1.25% propionic acid (100%) by weight for a year's storage (3gallons/ton wet grain). If storage time of 6 months or less is needed the amount of acid can be reduced by half. Propionic acid is somewhat problematic as it corrodes metal and storage should be only in wooden structures. Also, this product can only be obtained in large quantities. Ammoniation should be done at 2.3% of dry matter content of grain. Outside stored grains would have to be covered and all precautions are taken that oxygen is excluded from the pile to ammoniate the grain. Both options, ammoniation and treatment with propionic acid would only make grain of use for cattle feed and it can no longer be sold to elevators.
5. Layering or mixing sprouted grain into the silo as other forage is being ensiled.
6. The question of round bale silage or chopped silage is often also posed. Oxygen exclusion would be very poor and spoilage would be anticipated as being quite high. If anything, preservation method in round bales would have to be similar to ammoniation of straw.

Feeding value / Mold concerns?

Feeding value is not reduced in these grains, unless sprouting is very extensive (above 50%). Molds are a concern and doing a test for toxic molds is advisable. Simple mold analysis for quantity of mold is only part of the story. Introduce feed to growing calves at minimal levels to determine if there are problems such as reduced feed intakes. If no problems are observed in growing calves, feed levels can be slowly increased. Use as a supplementary energy source for beef cows can be a problem since large quantities of mold and/or specific molds can cause abortion.

Conclusion:

Sprouted grain should be stored outside and used early in the winter feeding period. Tested moisture content should be treated with some caution and 1 to 1.5% should be added to read test off combine. Ensure air circulation through stored grain to minimize spoilage. Aeration vents are best, however moving grain with an auger to turn it is also an option. Spoilage can be substantially reduced by ammoniation. This would require the pile to be covered with plastic to exclude oxygen for ammoniation. The ammoniation process would take at least 30 to 35 days to be complete, depending on environmental conditions.

Market Outlook

By: Michael Buchen - Feeder/Feedlot Specialist

Cattle feeders placed fewer cattle on feed again during July marking the fourth month in a row that net placements declined. Total placements of cattle on feed from May through July this year declined 572,000 (4%) compared to 2001's. This reduction of placements indicates fed cattle supplies will tighten up this fall and lead to smaller steer and heifer slaughter. Large competing meat supplies, especially pork, will hamper the expected recovery in slaughter cattle prices this fall. Later this fall cash slaughter prices could reach the high 60's to low 70's still only breakeven, depending on barley/corn prices.

Feeder calf prices are holding up surprisingly well in the face of rising barley and corn costs. Feed costs are up approximately 40%. Its too early in the fall run to predict, but calf prices appear to be 20 to 40 cents a pound under last years averages. Huge discounts for off types, horns and belly nuts will dominate markets this fall and spring.

The national cow herd has yet to start retention of heifers to rebuild its numbers. The bulk of the cows in drought areas were not slaughtered but relocated to other regions where ample forage supplies prevailed.

It has rained in the past weeks in many of the drought stricken areas. The attitudes of many are better and fed supplies are getting easier and cheaper to acquire. We are not out of the woods yet, but there will be profits and opportunities in this industry, there always is. One that I see is the retention of bred heifers to replace drought stricken Alberta and Saskatchewan.

Utilization of Forage Cubes to Deliver Minerals and Feed Additives to Cattle

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Manitoba's long days and temperature patterns provide an ideal climate for the production of high quality forage. As such, many beef producers in the province have the option of feeding backgrounded steers or gestating cows all-forage rations. For both groups of animals, the forage may provide sufficient quantities of energy and protein but may be lacking in several micro minerals, including copper, manganese and zinc. Producers are then faced with the challenge of ensuring that animals fed all-forage diets receive sufficient quantities of trace minerals, ionophores, or other feed additives on a daily basis. To help producers solve this problem, a study, funded by the Manitoba Forage Council, the Manitoba Cattle Producers, ARDI, and Tirol Inc., was conducted to compare consumption when mineral is delivered via a fortified cube and on a free-choice basis.

To accomplish this task, thirty-six Simmental-cross/Charolais-cross cows in the second trimester were given a copper depleting ration for a period of 42 days. Subsequently, a 42-day stabilization phase was achieved by feeding low copper hay (3.3 ppm, DM basis). In an attempt to return copper stores to a normal level, cows were then fed hay and one of the following three alfalfa-barley concentrate cubes: A – no additives (salt and mineral provided on a free-choice basis); B – salt and mineral added; and C – salt, mineral and Rumensin® added. Each cow received 2 kg of cubes on a daily basis.

Daily intake of mineral during the 16-week trial was 41±2.3 and 30±0 g/hd/day when delivered free-choice and via the cube, respectively. There was considerably more variability in mineral intake when mineral was delivered on a free choice basis as the coefficient of variation for daily intake was 81% with free-choice consumption and 0% when mineral was delivered in the cube. There were no differences among treatments for cow or calf serum copper or zinc or for cow ceruloplasmin activity in the last trimester of gestation and the initial six weeks post-calving. Calf

ceruloplasmin differed as calves from cows consuming cube B had higher ceruloplasmin activity at six weeks of age than those from cows consuming cubes A and C.

Conclusions

- Significant day-to-day and pen-to-pen variation in consumption was observed when mineral was offered on a free-choice basis
- Cubes may be used as an effective means of eliminating the variability in intake associated with free-choice consumption

Controlled delivery of copper via the use of fortified cubes may reduce potential copper deficiencies in suckling calves.