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IN THIS ISSUE

Corn Stalklage and Wheat Straw in Wintering Beef Cow Diets

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As the livestock industry is struggling from increasing financial pressures from the ever rising cost of feed, now more than ever beef cattle producers should consider taking advantage of lower cost forages to minimize feed costs and nutrient wasting. Winter feeding costs represent a large proportion of the total cost of production in the cow/calf industry. More closely matching the nutritional requirements of the cow may yield some significant feed cost savings without influencing the performance of the calf, especially during mid-pregnancy when her requirements are relatively low.

There are numerous lower quality forages that often go underutilized in beef cow rations. Crop residues, including wheat straw and corn stalklage, are much lower in protein, and higher in ADF (acid detergent fibre) and NDF (acid detergent fibre) than good quality hays and haylages. These crop residues are often available for a fraction of the cost of hay/haylage and can be used to dilute high quality forages to closer meet the requirements of the pregnant cow.

Figure 1. Cow with neck transponder eating at her individual feedbunk

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Ministry of Agriculture, Food and Rural Affairs

Ontario

Once the beef cow has weaned her calf, her nutrient requirements are relatively low. During this time the nutrient requirements for pregnancy and foetal growth are low and the cow herself needs only to meet basic maintenance nutrient requirements. Often times, with the high quality forages that are often grown in Ontario, cows are receiving excess nutrients, often much more than they require during this period in their production cycle. This may be an opportune time to include some lower quality forages in the ration in order to more closely match the lower nutrient requirements of the mid –gestation cow. However, caution is required in restricting nutrients to the pregnant beef cow. If the cow is restricted to the point where she needs to use body reserves to maintain pregnancy and she looses too much condition, she may have difficulty calving, and may have reduced milk yield, which can result in poor calf performance.

Corn stalklage is similar in nutritional content and fibre digestibility to wheat straw, however, it is underutilized as a potential low quality feedstuff in beef cow rations. Where wheat straw availability for feed uses is sometimes in competition for use as a bedding material, corn stalk material may also be utilized. There has been an increase in corn grain production in recent years which may leave the crop residues from grain corn production available for a potential low quality forage source for cattle.

One of the challenges in utilizing lower quality forages is that cows may not freely consume these crop residues. The use of a TMR mixer can help incorporate crop residues with higher quality forages, but feed sorting still can occur. Feed refusal and excessive feed sorting can negatively impact feed intake, which may have implications on cow and calf performance.

A recent study we conducted at the University of Guelph investigated the use of wheat straw and corn stalklage in TMR rations for pregnant cows. Corn stalklage was harvested from the field after the grain had been harvested, similar to the method used for corn silage, by cutting and chopping the stalks and leaves of the corn plants and ensiling them in a bunker silo. Both the wheat straw and the corn stalklage were added to the ration at 40% (on a dry matter basis), with the remaining portion being a high quality grass/alfalfa haylage. Although the nutritional analyses for the rations containing crop residues were very similar (Table 1), the cows fed the TMR containing stalklage lost body weight and body condition over the feeding period (Table 2). This is likely due to some palatability issues with corn stalklage, resulting in a depression in overall feed intake. Although there were no differences in calf birth weight between the cows fed wheat straw and corn stalklage fed cows, calf weaning weights were lower for cows fed corn stalklage than for cows fed wheat straw. The cows that were fed only haylage had calf weaning weights which were similar to those of cows fed rations containing wheat straw.

Table 1. Diet composition and analyses

Analyses[zy]	Dietary Treatment			Wheat Straw Only	Corn Stalklage Only
	Haylage Ration	Corn Stalklage Ration	Wheat Straw Ration		
DM, %	36.7	27.4	47.6	90.5	30.2
CP, %[z]	18.3	11.4	11.7	4.2	4.2
NDF, %[z]	49.5	63.4	64.5	82.7	81.8
ADF, %[z]	42.2	51.0	50.6	56.8	56.8

[z] % DM basis. Average of weekly TMR samples. Wheat straw and corn stalklage component samples are average of four samples taken over experiment period.
[y]DM = dry matter; CP = crude protein; NDF = neutral detergent fiber; ADF = acid detergent fiber

When we corrected the cow's bodyweight for the weight gain associated with pregnancy (i.e. calf and associated tissue growth), we found that cows that were fed a ration containing corn stalklage lost about 50 kg of body weight on average, while cows who were fed straight haylage gained about 50 kg on average. The cows fed the ration containing wheat straw maintained their bodyweight, gaining only 2 kg on average. Since calf weaning performance was not improved by the excess body weight gain in cows fed straight haylage, we conclude that the ration containing wheat straw more closely met cow requirements without wasting nutrients by building unnecessary cow bodyweight.

Figure 2. Corn stalklage packed in a bunker silo at Elora Beef Research Center

Table 2. Cow and calf performance

	Dietary Treatments		
Item	Haylage Ration	Corn Stalklage Ration	Wheat Straw Ration
Cow Average Daily Gain, kg/ day	1.07[a]	-0.13[b]	0.51[c]
Cow Dry Matter Intake, kg/day	12.8[a]	6.7[b]	10.9[c]
Cow Change in Body Condition Score[z]	0.3[a]	-0.3[b]	-0.04[c]
Calf Birth Weight, kg	43.2	44.3	44.3
Calf Weaning Weight, kg	266[ab]	253[a]	282[b]

[z] Difference between initial BCS and final BCS on a 5 point scale where 1=emaciated and 5=obese.
[a-c]. Values in a given row not sharing the same superscript letter differ (P <0.05)

From this research it is evident that including corn stalklage at 40% (dm) is not advisable since cows lost bodyweight, body condition and had decreased calf weaning weights at time of weaning. However, due to the similar nutrient content to wheat straw, corn stalklage still may have a place in wintering rations for beef cows, but at a lower inclusion level in order to overcome some of the palatability issues and increase feed intake. A wintering pregnant cow diet of 40% wheat straw and 60% haylage (dm basis) fed in a TMR supported calf weaning weights similar to those produced from cows wintered on a straight haylage diet. Wheat straw is a viable feed for inclusion in diets for pregnant beef cows, providing overall diet nutrient levels are adequate. The economics of adding wheat straw to diets will depend on its availability and cost, and access to a TMR mixer.

Acknowledgements
Thanks to Charlie Watson and the staff at the Elora Beef Research Center, Ira Mandell, Steve Miller, and Matt Kelly for their assistance during this study, and to the Ontario Ministry of Agriculture, Food and Rural Affairs for funding.

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Windbreaks Provide Shelter for Cattle

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Cattle don't always need housing, but they do need shelter from the elements. Windbreaks, either natural or constructed can provide that shelter.

Natural Windbreaks
The downwind influence of a windbreak is 10 times the height. This means that a windbreak of 20 foot high trees will have an influence on the wind pattern 200 feet downwind (see Figure 1). If you are considering planting trees to protect a building or yard, set the windbreak a minimum of 60 to 65 feet upwind of the building or yard to be protected. The windbreak should consist of two or three rows of evergreen trees. Since they tend to grow to different heights at maturity, a variety of species is planted. For a two row windbreak, plant a row of cedars and spruce. If three rows are planted, then use cedar, pine and spruce. When the spruce are mature the bottom limbs will die down, but the cedar will continue to grow close to the ground.

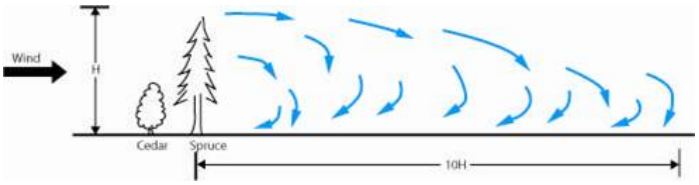

Figure 1. Porous windbreaks, such as this tree shelterbelt give good protection for a horizontal distance of about 10X their height.

When selecting a site in a bush, it is best to look for a stand of evergreens, as they will provide the best shelter, but it is important to consider both wind protection and snow patterns. You want to protect the cattle from the wind and snow, but you do not want a location where the trees cause the wind to loose all of its velocity and result in all the snow settling out and accumulating, making feeding and management difficult.

(Continued on page 4)

Windbreak Fences

To protect barns and feedlots where natural windbreaks do not fit the farmstead plan, windbreak fences are used. A fence with a porosity of 20% (see Figure 2) provides the best wind protection. Spaced boards (Table 1) allow some air to pass through but the draft is reduced. The height of the fence depends on the size of the area protected. The usual minimum is 8 to 10 ft in height.

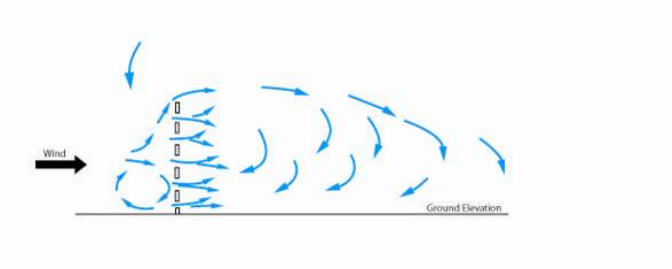

Figure 2. Effect of a 20% porous windbreak on wind patterns.

Table 1. Windbreak Fence Board Spacing for 20% Opening

Board Size (in.)	Slot Width (in.)	
	Rough Cut Lumber	Dressed Lumber
1 x 4	$^{7}/_{8}$	¾
1 x 6	$1\ ^{3}/_{8}$	$1\ ^{1}/_{8}$
1 x 8	1 ¾	$1\ ^{5}/_{8}$
1 x 10	2	2
1 x 12	2	2

Shade cloth can be used as an alternative to spaced boards for the purpose of wind protection. Shade cloth can be mounted on top of a concrete wall if the wall is needed to keep cattle in the yard. Shade cloth that is at least 20% porous should be used, and it will have to be firmly supported. If the shade cloth becomes plugged with ice or snow it may be torn off in a strong wind. Another alternative to lumber is plastic mesh windscreen. This product is about 25% porous and is designed specifically for windbreaks, and is not the same plastic snow fencing.

If snow protection is a major factor, construct a solid windbreak fence (see Figure 3). An open fence allows the snow through and it deposits on the downwind side. A solid fence, providing it is high enough, deposits the snow on the upwind side. The fence must be high enough to keep drifting snow from going over the top. Recommended height is ≥ 8ft. The area downwind from the fence will have reduced air flows, although not as great as with the 20% open fence.

Figure 3. A board windbreak showing the spacing between planks

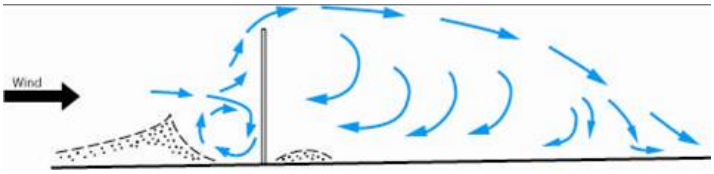

Figure 4. A solid windbreak used where snow is a factor.

A windbreak in the form of a swirl chamber is used protect a building with an open front. The normal configuration is shown in Figures 4 and 5, with a windbreak fence attached to the swirl chamber to add further protection to the barn and yard.

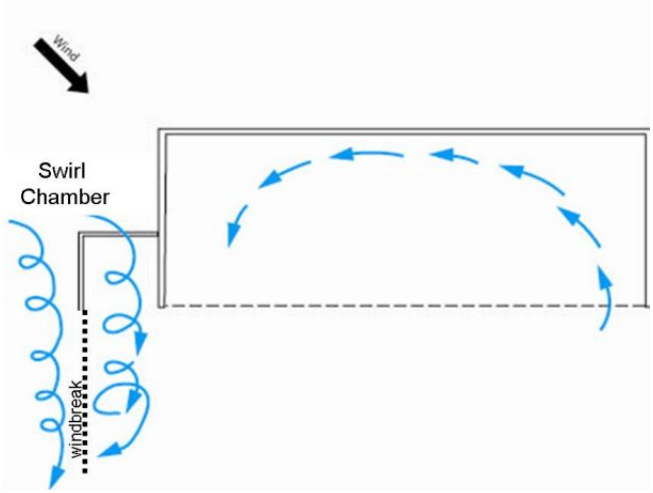

Figure 5. A swirl chamber and windbreak fence protecting an open front barn from wind from the rear.

The swirl chamber is on the windward side and is set back and away from the corner of the barn. The swirl chamber should be square. The minimum recommended size is 10 ft x 10 ft, with the maximum being 30 ft x 30 ft. A swirl chamber of 16 ft x 16 ft is a good choice. The fence height forming the swirl chamber is important. It should be equal to the height of the eaves or greater. This helps to break up some of the wind patterns that come over the roof and down to the open front barn.

Figure 6. Barnyard with Interior Windbreak Partitions Which Minimize Wind Chill and Drafts.

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Tell Me What They Want, What They Really, Really, Want !
… The Challenges of Producing Quality Beef for Branded Products

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Consistency, that's what the consumer wants !
Smaller portions, that's what the patrons want !
Local foods, that's what the market wants !
Lean beef, that's what the customers want !
Tender, juicy beef, that's what the connoisseur wants !
Hormone free, that's what the diners want !
Omega 3's, that's what the shopper wants !

Knowing what your customer wants – and supplying it - is key to a successful and vibrant long term business. But it can be trying to try to provide what customers want, especially if the customers themselves are not really sure what they want. For example, in consumer panels conducted for the Golden Beef brand in the North Bay area, a teacher told us that beef sold as Grade "A" must be the best, because A is what she gave as the top mark in her class. Another told us that feedlot cattle would be healthier than grass fed beef because the farmer was investing more time in looking after the cattle if they were "penned up" rather than "free range." Many consumers look for "no hormone beef" not knowing that beef cattle (along with all other animals) do a fine job of producing hormones on their own.

Providing a branded product for consumers that meets their needs and makes money for the producer is a challenge. For example, the American Angus Association® focused so much time and energy on selecting for marbling that lean meat yields in they breed suffered dramatically. At the 2007 Beef Improvement Federation meetings in Colorado, many speakers presented articles on trying to keep the marbling advantage while enhancing lean meat yield.

The Certified Angus® program has done an excellent job of differentiating the Angus brand as having higher "quality beef" than other breeds. When you can go into McDonalds® and order an Angus Burger, where ground beef is branded according to breed, then you know a brand has succeeded.

A review of last year's Beef Improvement Ontario (BIO) bull evaluation records demonstrates that intra muscular fat (%IMF) ultrasound readings (which are a predictor of marbling), shows that the Angus breed had more bulls with higher IMF readings than other breeds. However, just picking any Angus and assuming it will put marbling into your program, can put a producer on the wrong track. Here's a good example ….

Table 1. Comparison of 5 BIO* evaluated bulls

Bull	Adj % IMF**	Predicted Quality Grade***	Adj Rib Eye Area Inches****
Angus 1	7.34	AAA	13.5
Angus 2	2.73	PD-A	13.1
Angus 3	5.35	AAA	11.6
Charolais 1	4.51	AA	13.9
Charolais 2	4.83	AA-AAA	15.4

*Beef Improvement Ontario http://www.biobeef.com/
** Intramuscular fat percentage, adjusted for age
*** based on marbling, with a range from least [PD-A (practically devoid)] to most (AAA)
**** adjusted for age

(Continued on page 6)

In Table 1, we see that Angus 1 and Angus 2 had Rib Eye areas that were very similar. However, marbling varied from a lot (Triple A) to very little (PD-A). If you belonged to a Certified Angus program and selected Angus 2, the resulting calves may not perform up to the standard expected in terms of marbling.

If a producer belonged to a branded program that had requirements for both marbling and lean meat yield, he might meet the marbling requirements by selecting Angus 3, however, the lean meat yield may be lower than needed. The other challenge may be that by using a high percentage of one breed to meet a branding standard, he may have to give up other economically important factors such as heterosis, which is really important for calf survivability and reproductive traits.

If a producer was part of a branded program such as Ontario Corn Fed, he might want to consider Charolais 2, which provides adequate marbling, plus larger rib eye to increase lean meat yield. Alternatively, if the branded program required smaller carcasses for smaller meat cuts to meet client needs, the best option might be to select Charolais 1.

The example table reinforces the reality that there is as much or more variation for a trait within a breed as between breed averages for the trait. And producers don't breed their cows to breed averages; they breed them to individual sires, which happen to be members of a certain genetic group called a breed.

Selection using ultrasound provides for genetic progress in several carcass traits. But as Dan Moser of Kansas State University concluded at the 2007 Beef Improvement Federation meetings, " A final consideration is likely both the least controversial and the most important. Cattle breeding is a long-term proposition, where generation interval averages five years or more. When you consider that we measure genetic change in seedstock populations, but evaluate phenotypic change in commercial cattle, it's not surprising that there is a time lag between genetic and phenotypic change. The combination of patience, a necessary but somewhat scarce ingredient for successful cattle breeding, coupled with critical evaluation of technologies old and new, should result in visible improvement of beef quality in the future."

Becoming part of a branded program is just the first link in the chain of providing products consumers want. Use tools that are available, such as BIO evaluated bulls, which have information to allow you to narrow the selection window for the animals you produce. But selecting the right genetics is just one of the steps in production. Following standard feeding protocols will also help produce more consistent products. For example, Ontario Corn Fed contains significant requirements for corn in the ration program. Corn is remarkably consistent, so the ration will be quite similar from farm to farm. Golden Beef, another program, is a forage fed program. Having pastures and forages that are consistent from farm to farm can be a real challenge. There is great variation in energy and protein between legume and grass, pasture or hay. Weather challenges the past two years have also increased the variance of quality from one farm to another. Harvesting animals from two different feeding regimes can provide incredible carcass variation.

Figure 1. Many steps are involved in product quality *(used with permission)*

Management can also greatly influence the quality of the product. Management by the cow calf producer prior to selling the calf has been shown to impact the grade of the animal. For many years, feedlot owners have desired to purchase "shrunk out" or thinner cattle, knowing that they will have compensatory gain once they reach the feedlot. Many cattle in Ontario are backgrounded on lower energy rations so they will gain well on pasture during the summer. But research by Gona et al (2002) showed that cattle that were classified fleshy or slightly fleshy had higher harvest marbling scores than cattle that started the feeding period classified as leaner. If we select cattle that are genetically prone to marble, we need to feed those cattle enough energy throughout their lives to demonstrate that marbling ability.

In a branded program, getting producers to agree on the genetic and feeding regimes can be as much fun as herding cats. Cats respond best when attracted to a common goal, like a tasty can of tuna. Producers respond best when they are drawn to a common goal such as a value chain which returns increased profits to the group. However, the ultimate success of any branded program is based on a well defined end product, achieved through the right mix of breeding, feeding and management. Make sure you listen to your target market when they "tell you what they want, what the really, really want"!

(Continued on page 7)

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Selecting and Culling for Efficient Cows

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One of the most important decisions in a cow-calf operation is the selection of heifers to retain as replacements. Whether selection is at weaning or some time later, picking the keepers will impact the future profitability of your cowherd. In years when calves are selling for high prices, it is difficult to rationalize keeping many heifers. However, a year in which calf prices are low is a good time to both retain a number of heifers and consider culling deep into the cowherd.

Cows are usually culled due to functional reasons: they are open, have bad feet, bad udders, poor condition or a "disagreeable" temperament. Cattlemen need to look harder at the efficiency of their cows and uniformity of the herd. In most herds, there is great variation in type and size of cows. It is estimated that 70% or more of the costs in calf production are in the feed required just for maintenance of the cowherd. Having efficient cows is critical to the financial success of a cow-calf operation. Running efficient, easy-keeping cows would seem a logical approach to keep input costs down.

When was the last time you weighed your cows? Most cattlemen underestimate the mature weight of their cows. Generally, bigger cows cost more to maintain … they have higher feed requirements and require more supplementation, and so simply cost more. Take a look at the larger cows in your herd and ask these three questions:

Are they weaning the biggest calves?
Are their calves big enough to offset the additional feed required for that cow?
Do these calves sell for a significant premium over lighter calves in the herd?

One study at North Dakota State University found that bigger cows (1600lbs) not only weaned a much lower percentage of their body weight, but in fact weaned lighter calves than smaller (1200 lb) cows. An interesting study by John Lawrence at Iowa State showed that calves from lowest cost cows actually provided a higher feedlot return.

Economies of scale are a solution to reducing costs per cow and can lead to greater profitability. So consider how many more 1200 lb cows you could keep with the same amount of feed, if you had fewer 1600 lb cows.

When you consider the importance of mature cow size to economic productivity, selecting efficient, moderate sized replacements can be paramount to the success of a cowherd. Producing superior replacement heifers requires a specialized breeding program, which may not be practical on many cow-calf operations. A good alternative is to source heifers from breeders who specialize in their production. There are herds in Ontario that are in the business of producing maternal line heifers. For many producers, especially those with smaller herds, obtaining replacement females from these herds is the simplest and most cost effective means of selecting replacements for their herd.

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Beef Research Update

Friday Dec 4th, 2009 1:30 to 6:00 pm

University of Guelph Turfgrass Institute, 328 Victoria Road South, Guelph

This event is free of charge thanks to our sponsors …

Ontario Cattlemen's Association - University of Guelph - Ontario Ministry of Agriculture, Food and Rural Affairs

Time	Presenter	Topic
1:30 pm	Christoph Wand & Tom Hamilton, Ontario Ministry of Agriculture, Food and Rural Affairs	*Welcome !*
1:40	Ann Huber, Soil Resource Group, Guelph	Reducing pathogens during storage of livestock manure
2:00	Pat Shewen. Ontario Veterinary College	Neonatal calf vaccination: B cell responses
2:20	Ira Mandell, Ontario Agricultural College	Transportation conditions for feeder and yearling cattle transported by road in Ontario
2:40	Derek Haley, Ontario Veterinary College	Two stage weaning
3:00	*Break*	*Refreshments*
3:20	Steve Miller, Ontario Agricultural College	Beef genomics for product quality and efficiency
3:40	MK Abo –Ismail, Ontario Agricultural College	Improving beef traits using a DNA test panel
4:00	Yuri Montanholi, Ontario Agricultural College	Feed efficiency assessment using infrared thermography
4:20	Al Mussel, George Morris Centre	Optimal management of the beef production chain
4:40	*Break*	*Refreshments*
5:00	Katie Wood, Ontario Agricultural College	Corn or sorghum dried distillers grains for feedlot steers
5:20	Ira Mandell, Ontario Agricultural College	Pasture finishing of beef in Northern Ontario
5:40	Christoph Wand, OMAFRA	Rubber mats for slatted floors
6:00	Christoph Wand & Tom Hamilton, OMAFRA	Wrap up
6:05		Adjourn

Beef Business Symposium

Saturday Dec 5, 2009
9:00 am to 4:30 pm
Room 1714, Lifetime Learning Centre
Ontario Veterinary College, University of Guelph

Agenda

Getting Started – *Participant Survey; Christoph Wand, OMAFRA*

Carcass Results from the Keady Calf Club Pilot; *Brittany Livingston, BIO*

What you Find When you Measure; *Joel and Sarah Gardiner, Gardiner Farms*

The Next Step to Calf Clubs; *Steve Hopkins, Virginia*

What Food Service Needs; *Marco Gotowiec, Keg Restaurants*

A Youthful Perspective on the Beef Industry
Rachel Beilak – Beef Marketing Company
Matt McCall – McCall Livestock
Sally Smith-Pelleboer - Tillsonburg Cow-Calf Producer

Defining the Money-Making Endpoint; *Gary Teague, Colorado*

Aligning the Supply Chain to Meeting Changing Demand; *John Baker, BIC*

What have we learned? – *Participant Survey* **;** *Brian Pogue, OMAFRA*

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