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IN THIS ISSUE

The Key to Top Pasture Performance

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The pasture season will be upon us as you read this article. Since commodity prices are at some of the highest levels we have seen, it is important to realize the full opportunity for pasture in your livestock enterprise in these times. What steps have you taken to maximize your pasture returns for this year?

Pasture is the lowest cost feed source available, and the opportunity for improved production is significant on most farms. Pasture gains of up to 600 lbs per acre and over 300 lbs per head have been reported to me by beef producers with a good rotational system and attention to detail on both the forage and livestock management. A well managed pasture will be very competitive with any other crop use that you might consider for that land base.

Figure 1. Fresh forage maximizes animal performance.

The key steps to maximize both forage and livestock production is to manage the forage for optimum growth and optimum bite size for the animals grazing. To get optimum growth from the forage plants they need to be in a rapid

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growth state for as much of the growing season as possible. Maintaining a grazing forage height between 10 cm (4 inches) and 30 cm (12 inches) will allow the plants to maintain good growth and capture all the available sunlight to drive photosynthesis. This plant height will also maintain a substantial root system that will be able to gather water and nutrients throughout the summer, and minimize a summer dormancy period should we get into hot dry weather. To maintain this level of forage growth, the pasture manager needs to move livestock to fresh grass every couple of days. If too much pasture is offered at a time then selective grazing will take place and the less desirable plants will not be grazed and will become mature.

After a plant is grazed it needs time to rest and re-grow; this is the key point of pasture management - rest and recovery.

From an animal management standpoint, maximizing bite size is the key to good productivity. Cattle bite at a rather constant rate and for about 8 hours each day. The variable that you can control is the size of the bite. By providing pasture that is the optimum size for the animal to bite (10-30 cm) you will have taken the first big step to maximize intake. The second step is to have fresh forage on offer at all times. Livestock are not going to eat forage that has been laid on or fouled with manure or urine. The longer the animals are in a given paddock, the greater the percentage of forage in that paddock that is going to be unpalatable because of what has been done to it, thus the importance of frequent moves to fresh pasture.

Fencing is the tool that will allow you to manage your livestock to provide re-growth time for the grass, and manage the quality and quantity of forage available for your livestock. Temporary or semi- permanent single or double wire electric fence will allow you to control your livestock to achieve improved pasture performance from both the forage and the livestock.

Moving livestock to fresh pasture every 1-2 days will optimize plant growth by allowing the plants adequate rest and recovery time (it takes 15-20 days to recover from grazing in the early part of the season and 30-45 days in late summer). These same 1-2 day moves will encourage optimum bite size by the livestock by providing readily available fresh forage.

This combination of readily available and high quality forage will give maximum forage production and maximum animal performance. By applying these two principals to your pasture system you will make pasture a profitable part of your farm operation.

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Start Heifer Selection at Birth

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The formula for a successful beef industry can sound quite simple – have cattle that are fertile, grow efficiently, produce a valuable carcass and does all of this profitably. The cowherd is critical to the process. Many cow herds in Ontario retain their own heifers as replacements for cows which are culled from the herd. There is a long list of characteristics which make for a productive cow and the relative importance of these can vary somewhat from farm to farm. Sometimes these traits are referred to as convenience traits but in reality they are necessary traits. Having trouble free cows is the foundation and is a necessity! Unfortunately, many of these traits do not have EPDs (Expected Progeny Differences) to evaluate them, but hopefully this will change, particularly with the addition of DNA evaluations. There is a need to measure and ensure functionality traits. The bottom-line performance of commercial herds is dependent on these functional traits.

Figure 1. Productive mother cows take excellent care of their calves

The list of traits of what makes a cow problem free would include:

1. Fertility – calve every year and consistently in the first cycle
2. Calving ease – no one wants to be pulling calves and dystocia affects future fertility
3. Temperament – who wants to get run over by a cow?
4. Maternal ability – will lick calf off and look after it from the first nursing to weaning
5. Structure – which includes many things that relate to longevity – feet, udder etc.
6. Size – a moderate cow with minimal feed intake
7. Efficiency - having a cow that weans a high percentage of her weight
8. Ease of fleshing – a cow that can maintain her flesh (body condition) while raising a good calf
9. Colour – pigmentation of udder and eyes so as to not be affected by the sun

For herds which are selecting bulls from which they will keep daughters, these traits are also important and must be considered along with the "performance" traits for which we have EPDs available. Visually appraising the dam of a bull you plan to buy is an important step in the process of investing in a bull.

The process of selecting the "right kind" of heifers can start at birth with a quick checklist:

- Is the heifer born within the first calving cycle?
- Was the heifer born unassisted with a smaller than average birth weight and was vigourous?
- Does mom have an easy going but still maternal disposition?
- Does mom have a nice tight udder with smaller teats?
- Does mom have good feet which are square and sound?
- Is mom an easy fleshing cow?
- Does mom have a history of weaning above average calves?
- Is the maternal granddame still in the herd?

If the heifer passes this list of tests at birth, then give her a special eartag, or notch the tag and be sure to record it. The group of heifers identified this way will be the basis for your replacement heifers which can be evaluated again near weaning.

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Lowering Livestock Losses from Predation

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Livestock predation costs. Predation costs the farmer time, money and emotional stress when production animals are destroyed. Predation costs the government time, money and emotional stress as public servants and municipal evaluators investigate livestock kills and compensate producers for their losses.

In 2010, the Ontario government paid out over $1.4 million to producers as compensation for their livestock losses. These payments have more than doubled in the last 5 years.

Livestock Claims in Ontario

Fiscal Year	# of claims	# of animals injured /killed	Compensation $
2006/2007	2,928	4,563	990,775
2007/2008	3,163	4,829	1,038,617
2008/2009	3,779	5,964	1,292,921
2009/2010	3,834	6,153	1,392,822

Neither government nor producers wish to see livestock killed by predators. However, communicating to predators that farm animals are "friends not food," remains a challenge. Mitigating losses would seem to be the only course of action in living in a world with both predators and predated animals, i.e. livestock.

Several wild animals will attack and consume cattle. Bears, wolves, and coyotes would be the most frequent culprits. In the last few years, coyotes are killing more and more calves.

How do you know if your cattle are the victims of predation? Bleeding and bruising only occurs in live animals or for a brief time after death. Other tell-tale signs include punctures, cuts and tears from teeth or claws. Quick investigation after an animal's death can determine if the animal was killed by a predator, or died from other causes and was scavenged by a predator, crows or other animals. Other signs of a predator attack can include broken and flattened vegetation, drag marks, blood or trails of blood. Some other visible indications of predators include: alert, nervous livestock, injured livestock, mother calling and searching for her young, predator hair on fences, dig holes under fences, fresh predator tracks near a carcass, or predator feces near a carcass.

Once you have determined you have a predator problem, what can you do to help mitigate further losses? The first step is making sure you dispose of any dead livestock, stillborns, or afterbirth. These tissues, if left around, will attract predators, helping them make the leap from cows as friends to cows as food. OMAFRA has information on line as to how to dispose of carcasses by burial or composting. ontario.ca/deadstock

Confinement and fencing:

Farms with brush and forest are subject to more attacks than unforested open areas. Attacks tend to occur more at dawn

and dusk. One option with smaller herds is to bring the cattle in at night to a confinement area. Costs for predator proof fencing become somewhat prohibitive when large numbers of cattle are involved, plus the labour involved can be overwhelming. A recent study on a sheep farm on Amherst Island put costs in 2001 at $2.37 per foot of predator exclusion fencing. Other costs of confining cattle include increased coccidiosis load, fly build up and reduced growth.

Figure 1. Predator exclusion fencing

Electric fencing can be an important component of any predator control program. Perimeter fences must be at least 5 strands, alternating live and ground wires. Anything less is not effective in deterring coyote predation, especially if predation has already occurred on that farm.
Spacing of wires is also important. Make sure the lower 3 wires are 6 in. apart to ensure that coyotes come in contact with both live and ground wires when attempting to pass through the fence. Wires in the top part of the fence can be further apart to increase the total height of the fence. For more information on fencing see the OMAFRA fact sheet entitled "Sheep Fencing options for Predator Control", http://www.omafra.gov.on.ca/english/livestock/sheep/facts/02-053.htm

Livestock guardian animals:

Donkeys, llamas, dogs and horses have all been used as livestock guardian animals. Most large sheep producers rely on dogs. Dogs that are raised with cattle have shown that they have protective instincts. They are expensive, but effective. A recent cost study indicated that it costs roughly $800 per year per dog for protection. The dogs act as a deterrent by living with the cattle and attacking all intruders including stray dogs, coyotes or humans. The dog patrols the area around the cows, scent-marks its territory and barks. These three activities alert the coyote or wolf to the presence of dogs. As the coyotes adapt to guardian dogs, more dog power per cow is required. Generally, the coyotes will either try to draw the dogs away from the cows, sending in pack members from behind, or will determine that it is not worth trying to attack a guarded herd. Recently there have been instances of dogs being attacked by coyotes. This remains very rare, as the dogs are usually bigger than the predators.

Donkeys will work to protect cattle as well. The concept seems to be that donkeys have an inherent dislike of dogs and will bray, bare its teeth, kick or bite dogs and coyotes. One thing to watch for with donkeys is the female's willingness to kidnap new born calves and kick the cow away from its baby.

Sometimes scaring devices will work for a while with wolves and coyotes. Scientists in Wisconsin and Michigan have used electronic signal motion detectors which can set off either sirens or strobe lights to frighten the predators away. While these are costly, they are a very effective short term deterrent. Eventually, the coyotes determine that these are not life threatening and will adapt to the sound or light show.

Removal of problem predators has been effective in the past. Coyotes or wolves which identify calves as food need to be killed as soon as possible, so they don't train their fellow pack members to hunt cattle as well. A pilot removal program in 1997 and 1998 had trappers hired to remove suspect coyotes. During the short trial, harmed livestock dropped from around 4000 to below 3200 by the year 2000. Shortly after the pilot removal program cancellation, livestock claims started rising again, and have continued to increase to current levels of nearly 6000 coyote and wolf kill claims per year.

One of the challenges of problem coyote removal in southern Ontario is the prohibition against non lethal restraint mechanisms. These devices are a proven method of catching coyotes, through identifying trails and setting the restraint mechanisms at travel or fence hole locations. These snares are a legal option in northern Ontario. A trial for the use of non lethal restraint mechanisms, as well as other potential prevention tools will be occurring this summer in southern Ontario.

There is divided research on whether a total coyote hunt will reduce overall livestock predation. In the short term, kill numbers would go down. In the long term, there is a suggestion that coyote numbers will increase to fill a vacuum. The species is very adaptable to its environment. Depending on where your farm is located, hunting can be socially acceptable, or cause problems with your neighbours. A coyote drive can provide an excellent opportunity to reduce the numbers of coyotes. By using hunting dogs, planes, and hunters spotted around a block of land, coyotes can be effectively driven out and shot. As indicated, drives can greatly reduce coyote numbers, but would have to be repeated every year.

Another hunt option would be den hunting. Finding the coyote dens in spring/early summer and destroying the pups will lower population as well.

The Ministry of Agriculture is working with the Ministry of Natural Resources and agricultural groups to reduce the incidence of wildlife-livestock interaction on the farm.

References:

Coyote Predation of Livestock
Livestock Valuation Guide for Ontario Municipalities
Predation and Wildlife Damage
http://www.omafra.gov.on.ca/english/livestock/predation.htm#manage

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The High Cost of Low Tech Beef

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Science and agriculture have had a long and rewarding partnership. Prior to the advent of modern scientific research, which commenced in the early 1900's, production per acre and per animal was low. Farmers fed their families and sold their small surplus of products to city dwellers, resulting in both meagre on-farm incomes and relatively high food prices. Over time, production technologies such as scientifically formulated fertilizers and genetic selection have dramatically increased yields and efficiencies. This modern era of agriculture became known as the "green revolution", and was heralded as the key to feed an ever growing population from a finite land base.

Here's a couple of examples of how agricultural production and food costs have changed over time. Data from Indiana show that corn yields increased from 30 bu/ac in 1930 to 160 bu/ac in 2005, an increase of 800% in productivity per acre (fig. 1)[1] As well, historical records show that in 1900, the daily wages of an average worker could buy 6 dozen eggs. By 1990, an average day's pay could buy 52.6 dozen eggs, an increase in relative purchasing power of 880% over this time period.[2] Technological advances have resulted in more efficient crop and livestock production, with corresponding benefits to society through lower food costs.

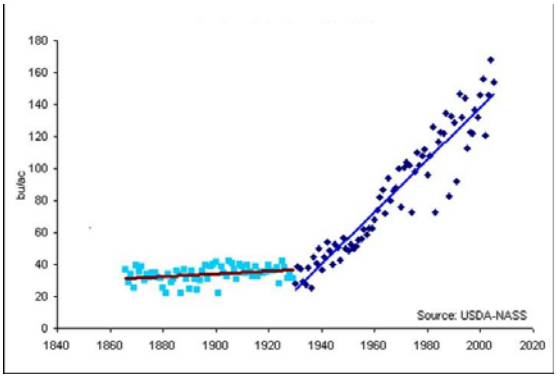

Figure 1. Indiana corn grain yield 1866 – 2005 [adapted from Nielsen[1]]

Currently, most beef production systems employ many technologies which improve growth efficiency, feed conversion and animal health. Producers can choose whether or not to pay for and utilize these technologies on an individual farm basis. Many producers do use a lot these technologies because they get a return on their investment, improving profitability. At the same time, consumers benefit when these technologies are used via lower meat costs at the grocery store.

However, some of today's consumers may be influenced by philosophical considerations. They may prefer to buy meat from production systems which do not use some modern technologies or techniques. For example, they may want to buy beef from animals which have not been implanted with a hormonal product, and/or not been fed grain, or fed only organically produced feeds and/or not treated with any antibiotics. In response to these marketing opportunities, some producers have developed value chains which supply these consumers with beef from systems which meet their criteria.

A question which often comes up when producers are contemplating a switch to low tech beef production is "how much of a premium do I need to get for my product to offset the higher costs of production" ? Scientists at Kansas State University set out to answer this question by reviewing published papers which examined technology use in the feedlot. After using stringent quality control criteria, they included 91 experimental comparisons from 51 papers. The production technologies were evaluated for their effect on average daily gain, dry matter intake, gain:feed ratio, morbidity and mortality.

The technologies included:

- hormonal implants
- tylosin
- mass treatment on arrival with an antibiotic

The overall impacts of antibiotic treatment and implants are shown in Table 1. These interventions resulted in significant improvements in daily gain, with implants in steers also improving gain:feed ratio and increasing dry matter intake.

Table 1. Effect of technologies on feedlot cattle performance[3]

Technology	Average Daily Gain (lbs/day)	Improved Gain:Feed	Dry Matter Intake (lbs/day)
Antibiotic treatment on arrival	+.24***	----------	----------
Implanted heifers	+0.18*	----------	----------
Implanted steers	+0.55***	0.02***	+1.12***

* P<.01; *** P<.001

As well, antibiotic treatment on arrival resulted in a 53% reduction in treatments for disease and 27% reduction in death loss compared with cattle which were not mass treated. Cattle not receiving tylosin in the diet were about 4 times more likely to develop liver abscesses than those who did.

The authors used an economic feedlot model to estimate the effect of using implants on cost of production (COP). They estimated that implanting reduced COP by $77 per animal compared with not implanting. In order to cover this added cost, producers would need to receive an additional $0.07/lb (live weight) when selling their finished animals. They also compared the COP for a conventionally fed, implanted steer with that of a non-implanted steer fed organic feeds, where the organic feeds were priced 50% higher than conventional feeds. In this scenario, the conventional steer had a $349 per head lower COP than the organically produced animal. They estimated the price premium required to compensate for the increased COP would be $0.28/lb (live weight)

These results indicate that beef producers contemplating natural or organic production as alternatives to conventional production should carefully evaluate their target markets to ensure they will be able to obtain a sufficient price premium to make the venture worthwhile.

[1] Nielsen, R.L. *Corn Grain Yield Trends: Eyes of the Beholder.* Purdue University http://www.agry.purdue.edu/ext/corn/news/articles.06/YieldTrends-0615.html#Fig1 <accessed April 2011>

[2] USA Diplomatic Mission to Germany. *About the USA: Facts & Figures: Income and Prices 1900-1999.* http://usa.usembassy.de/etexts/his/e_prices1.htm *<accessed April 2011>*

[3] B.W. Wileman, D.U. Thomson, C. D. Reinhardt and D. G. Renter. Analysis of modern technologies commonly used in beef cattle production: Conventional beef production versus nonconventional production using meta-analysis. J. Anim Sci. 2009. 87:3418-3426. doi:10.2527/jas.2009-1778. http://jas.fass.org/cgi/content/full/87/10/3418 <accessed April 2011>

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