OMAFRA Virtual Beef

VOLUME NO. 8 ISSUE NO. 21 February 2009

In This Issue

A New Method for the Determination of Lean Meat Yield in Beef Cattle

Robyn Pimm
Student University of Guelph

Lean meat yield is an economically important trait in the beef industry, as producers are paid on a $/lb basis of carcass weight, with a possible differential for yield grade. The Canadian Beef Grading Agency (www.beefgradingagency.ca) sets out guidelines for the grading and quality assessment of beef carcasses. They assign yield grades based on the estimated percent of lean yield; Y1 greater than 59%, Y2 54-58%, Y3 53% or less.

The grader uses the Canadian Yield Ruler (Figure 1) to determine the yield grade; they do so by combining muscle score (a combination of three categories of length and depth of the rib-eye (longissimus dorsi)), and fat class score (fat depth) in the chart. The Yield Grade is based on the yield equation:
Lean % = 63.65 + 1.05 X (muscle score) - 0.76 X (grade fat) (Canadian Beef Grading Agency). From here they assign the yield grade based on the estimated percent lean.

Figure 1: The Canadian Yield Ruler (Canadian Beef Grading Agency)

In the current system, producers are paid based on carcass weight, with a potential differential for yield grade. However, the problem with the current system is that carcasses are placed into one of three broad categories,

OMAFRA Virtual Beef is a technology transfer vehicle of the Ontario Ministry of Agriculture, Food and Rural Affairs.

This publication is available in electronic format at www.omafra.gov.on.ca/english/livestock/beef/news.html

Single paper copies may be obtained by calling 1-877-424-1300

Direct general questions and suggestions to:
Tom Hamilton
tom.hamilton@ontario.ca
705-647–2087

For inquiries regarding content of a specific article contact the author.

***Virtual Beef* is compiled by the OMAFRA Beef Team & edited by Tom Hamilton, Beef Program Lead, Production Systems**
Ontario Ministry of Agriculture, Food and Rural Affairs
Agricultural Information Contact Centre 1-877-424-1300 **OMAFRA Website www.ontario.ca/livestock**

Ministry of Agriculture, Food and Rural Affairs
Ontario

each of which contain a wide range of percent lean yield. It fails to distinguish within yield grade and award carcasses based on the proportion of lean. Therefore, it would be much more beneficial to producers if they were paid on a $/lb of predicted lean basis, (which is a much better reflection of the true value of a carcass) rather than lumping cattle into broad yield grade classes.

An example calculation is shown below in which two carcasses which weigh the same (800 lbs), and are both graded Yield 1 are compared for a $ value based on the amount of lean:
Average price for a carcass weighing
800 lbs = $1.68/lb* X 800 lbs = $1344
lbs of lean for a carcass with 59% lean yield =
0.59 X 800 lbs = 472 lbs of lean tissue

If the producer were paid on a $/lb lean tissue basis then
$/lb of lean tissue = $1344 / 472 lbs = $2.85/lb lean
lbs of lean for a carcass with 63% lean yield = 0.63 X 800 lbs = 504 lbs of lean tissue

Difference in lbs of lean = 504 lbs – 472 lbs = 32 lbs
Difference in value = 32 lbs X $2.85/lb of lean = $91.20

*The $/lb value comes from the most recent average rail grade price from the Ontario Cattlemen's Association (December, 2008). Based on the above calculations, the increased value of an 800 pound carcass with 63% lean yield compared to a carcass with 59% lean yield is $91.20. This is a significant difference for beef producers!

Therefore, an accurate estimate of percent lean at the time of carcass assessment is critical to rewarding producers for differences in yield. Several studies have been conducted to come up with prediction equations based on carcass measurements to accurately estimate lean yield. Traditionally, the area of the rib-eye (l. dorsi) is taken at the 12/13th rib interface and is used in combination with fat depth and carcass weight in prediction equations. Other methods have been explored by Crews (2001) and Bergen et al. (2003) in which they examined alternative measures from the l. dorsi; including width (herein referred to the same measurement as length) and depth of the muscle taken at the 12/13th rib interface (Bergen et al. (2003) employed two methods for length and depth). The results from both studies indicate that length and depth measurements can be used as alternatives to tracing the rib-eye area (which can be a more time-consuming process). Bergen et al. (2003) also explored alternatives using ultrasound imaging to obtain measurements of bodywall depth, gluteus medius depth, rump depth, etc. It was apparent from this study that adding bodywall depth to the standard area (or length and depth combination), fat depth, and carcass weight in a prediction equation generated a more accurate estimate of the actual percent lean. In addition, when the ultrasound and carcass methods of evaluation were compared, it was determined that the ultrasound method was superior to that of the carcass method.

Measurements In This Study
The work done by Bergen et al. (2003) prompted the current University of Guelph study in which measurements were taken post-slaughter on carcasses and on accompanying photographs of the same sections. Cattle from the Elora Beef Research station feedlot that were processed at the University of Guelph meat laboratory were used in the current study. There were 90 head, analyzed over a 23 week period. Measurements included two methods of measuring rib-eye length and depth to calculate rib-eye area, fat depth, carcass weight, bodywall depth, and bodywall percent lean (Figures 2 to 9) (for more detail see below[1]).

The measurements were taken on the carcasses using rulers, placed directly on the surface of the meat. Four digital photographs were taken for each carcass: two of the rib-eye, and two of the bodywall. They were scaled by placing two rulers within the frame of the image, so that the measurements could be converted from pixels to cm or cm^2. The measurements on the images were performed using Sigma Scan Pro 5.0 software. The rib-eye area was determined using the area function in the Sigma Scan Pro 5.0 software. For carcass measurements, the rib-eye and bodywall were both traced onto acetate paper, and the area was analyzed using a planimeter. The percent lean in the bodywall was determined by taking the area of the lean and dividing by the total area of the section. The University of Guelph meat lab staff determined the carcass weight, dissected the carcasss, and weighed the proportion of lean, from which the actual percent lean was derived.

A digital camera was used to capture the images, in order to mimic a method which could be easily employed by small packing plants and would not require costly sophisticated computer imaging systems that are feasible only in large packing plants.

(Continued on page 3)

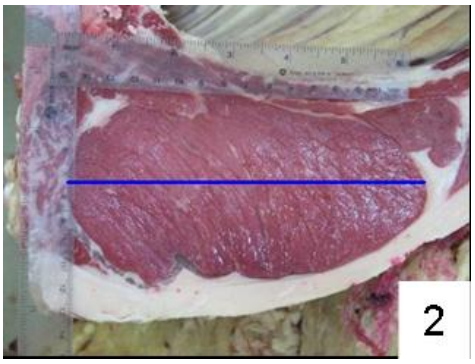

Figure 2: Rib-eye area-Method 1 length

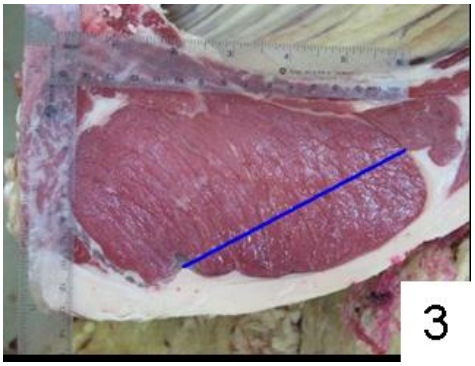

Figure 3: Rib-eye area - Method 2 length

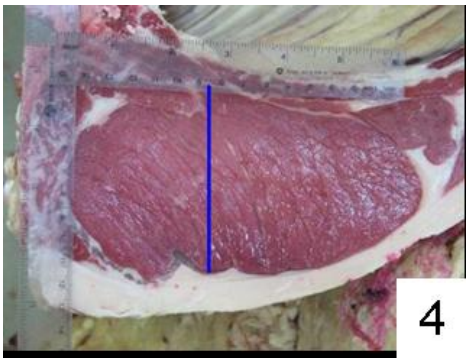

Figure 4: Rib-eye area - Method 1 depth

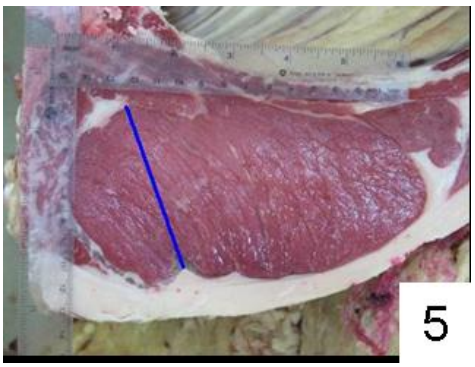

Figure 5: Rib-eye area - Method 2 depth

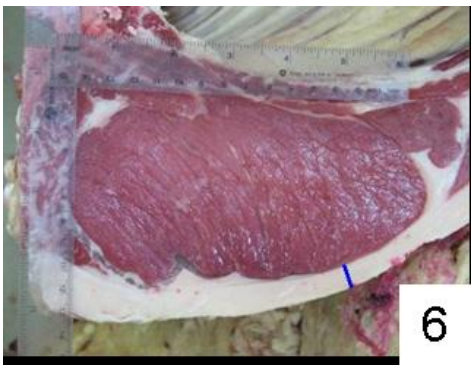

Figure 6: Fat depth

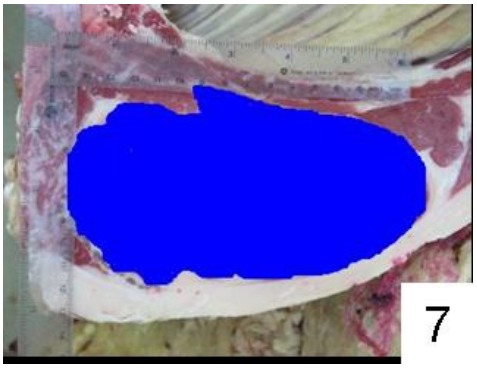

Figure 7: Tracing of Ribeye area

Figure 8: Bodywall depth

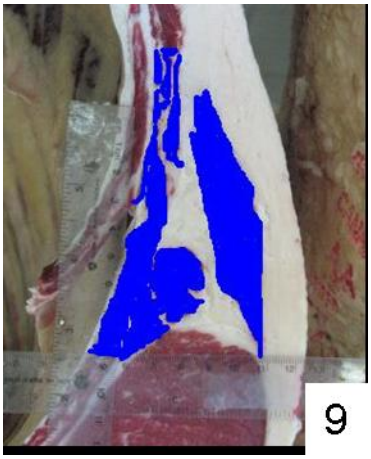

Figure 9: Bodywall lean

.

(Continued on page 4)

The results from the current study suggest that bodywall measurements (for image and carcass based methods) significantly improve the prediction of lean yield (Table 1). This can be seen by the large increase in R^2 values (correlation coefficients) when the bodywall measurements are added (especially in the case of the carcass evaluations). Therefore, we can conclude that adding bodywall depth and lean measures to the current methods improves the accuracy with which we can make predictions. These should be included in the assessment of carcasses for lean yield.

Table 1. Correlation of Predicted Lean Yield of Beef Carcasses (Various Methods) With Dissected Lean Yield

Evaluation of Carcass or Digital Image	Rib-eye Measurement Method	R^2	
		No Bodywall	Bodywall*
Carcass	Method 1 Length & Depth	0.22	0.39
	Method 2 Length & Depth	0.24	0.39
	Area	0.17	0.37
Digital Image	Method 1 Length & Depth	0.52	0.58
	Method 2 Length & Depth	0.49	0.56
	Area	0.49	0.57

*Includes Bodywall depth and Bodywall percent lean

Also apparent from these results is that length and depth measurements are slightly better than taking the rib-eye area, supporting the work done in previous studies. Additionally, equations developed from the image data were superior to those developed from the carcass data in their ability to predict lean yield. However, there are a couple of downsides to the image analysis method; for one, it is difficult to ensure each photograph is unskewed and clear (ie. the image is not blurred), and two, it is both labour intensive and time consuming in the follow up measuring stage. However, if technology (such as cameras and image analysis software) improves, and techniques become perfected, then these issues may be overcome in the future. There is promise in using this technique, and therefore further research should be conducted to evaluate the merit of such methods.

[1]Measurement details

Method 1 length was measured as the greatest distance from the medial to lateral edges of the l. dorsi, and method 2 length was taken from the apex of the acorn fat to the extreme edge of the muscle. The depths were measured as the greatest distance from the dorsal to ventral edge, and the distance from apex of the acorn fat to the point of maximum depth of the muscle for methods 1 and 2, respectively. The fat depth was taken in the fourth quadrant of the rib-eye at the point of least fat coverage, and the bodywall depth was measured at a point 4.5 cm from the lateral edge of the l. dorsi

References

Bergen, R. D., Crews, D. H., Jr., Miller, S. P. and McKinnon, J. J. 2003. Predicting lean meat yield in beef cattle using ultrasonic muscle depth and width measurements. Can. J. Anim. Sci. **83**: 429–434.
Crews, Jr., D. H. 2001. Alternative ultrasound predictors of beef carcass longissimus muscle area. Prof. Anim. Sci. **17**: 303–308.
Canadian Beef Grading Agency. www.beefgradingagency.ca
Ontario Cattlemen's Association. www.cattle.guelph.on.ca

---------- VB ----------

Robyn Pimm, BSc, Student
University of Guelph

---------- VB ----------

Harnessing The Power Of Genomics For Beef – A Collaborative Approach

Dr. Stephen P. Miller
University of Guelph

A previous article in this series in *OMAFRA Virtual Beef* introduced the field of genomics and how it will revolutionize beef cattle genetics, and in turn the beef industry. This area involves the direct analysis of the differences that exist amongst animals' DNA, and how these differences relate to the traits that we care about. Examples are reproduction, growth rate, feed efficiency and meat quality. The science of genomics is rapidly changing - tests are now available that allow an animal to be tested for 50,000 (50K) of these genetic differences called SNPs ("snips")!. Please refer to the previous article for a primer on this emerging field: (http://www.omafra.gov.on.ca/english/livestock/beef/news/vbn0708a3.htm)

This article will provide insight into how the successful use of this technology is transforming the dairy cattle breeding industry, and will shed light onto the need for more collaboration and coordination that will be required to fully harness this technology in beef cattle.

Will Genomics Work?

Before the industry fully embraces a plan to harness the opportunities that genomics provides, some concrete evidence that this technology will work in practice is required. There are now a number of genetic marker tests that have been independently validated and have been proven to work for cattle producers. Producers can use these tests now. However, the new technology discussed here is a result of a new large panel of 50K SNP, also known as the "Whole Genome Scan" or "Genomic Selection" approach. Proof now exists in recent developments in the field of dairy cattle breeding that this technology does work.

The Canadian Dairy industry, through the Canadian Dairy Network, the Centre for the Genetic Improvement of Livestock at the University of Guelph and the USDA is poised to introduce genetic evaluations to the Canadian Dairy industry in April 2009 (pending final approval) incorporating genotypes from the 50K SNP chip. The research to validate that this technology will work is already complete. And the results are quite impressive!

The benefit of this technology will be the greatest for young animals, who do not have progeny yet, or when we are trying to predict the genetic merit of an animal for a trait that we do not routinely measure, such as feed efficiency. Currently, when a young dairy sire is chosen to enter an AI stud and have semen drawn for the purposes of 'proving' him through his daughters' performances, the accuracy of the available genetic evaluations by which these young sires are chosen is quite low. The average reliability of a genetic evaluation on a bull at birth, which is based solely on his parents' proofs is 0.38 for production traits, as this young bull has no progeny and no record on himself. However, if we can add the information from genomics (50K SNP) to the prediction , this reliability increases to 0.67, an increase of 29 points in reliability. This represents a huge increase of 76% in reliability in the genetic selection of these young sires! [(.67-.38)/.38 = .76]. This technology is poised to have a major impact on the dairy cattle breeding industry. The technology will also have a major impact on the beef cattle breeding industry, but considerable work still lies ahead to realize the benefit.

The Need For Collaboration

The results from dairy cattle breeding represents a collaborative effort, as Canada and the USA are exchanging genotypes on sires and dams. A total of 4000 proven sires were used to derive the prediction equations which relate the 50K SNP genotypes to the production traits. These 4000 proven sires (semen straws used as source of DNA) are the result of a central repository from a number of participating AI studs in the USA, of which Semex is a member. Preliminary results from the USA also indicate that the increase in reliability due to genomics would be even greater if more than 4000 sires were available to determine the required prediction equations. This genotyping technology is very powerful, in that we can genotype a single animal easily for 50K SNP. However, it is now clear that the data requirement - the number of animals with DNA and measured traits that we need to derive useful predictions from these large numbers of genotypes is also quite large. The need for collaboration to exploit the full benefit of this technology is clear.

(Continued on page 6)

Canadian University partners Alberta and Guelph, represent the Canadian activities with the 50K SNP technology with a goal towards genomic selection for the beef industry.

Figure 1: Measuring feed efficiency

Our project includes 1250 animals genotyped with extensive data available. The project is providing some very useful results that will enable improved genetic selection technologies for beef cattle. However, although the project is of substantial size, it is acknowledged that the tools developed would be more powerful with a resource that includes more animals genotyped. The dairy example includes over 4000 progeny tested sires, with fairly accurate proofs, and evidence their suggests more bulls would still be advantageous. With beef cattle, we are dealing with many traits for which an animal has its own record (such as feed efficiency), but are not typically progeny proven bulls in most cases, as bulls are not proven in large numbers for all the traits we are interested in improving with genomics, such as feed efficiency and beef tenderness.. In fact we will need about 5-10 animals with their own records to get the same power as a progeny proven sire. So we can expect that increasing our numbers to 20,000 animals with complete performance information and genotypes will still be advantageous.

The resources required to exploit the full benefit of this technology are extensive and not likely to be completely met by one organization. For this reason Canadian University partners, Alberta and Guelph have entered into a collaborative data sharing agreement with both the Cooperative Research Centre for Beef Cattle in Australia and the USDA Meat Animal Research Centre, to combine the collective data in this area. All three organizations are involved with similar 50K SNP experiments in beef cattle. Data was exchanged in Dec 2008. The next step is to identify how additional resources can be coordinated across the three countries. This will require a combined effort with various industry groups such as Cattlemen's Associations and Breed Associations, University, Government and research organizations working collaboratively in a pan-Canadian effort to accomplish this goal. The effort and work before us is significant, but the potential benefits to the beef industry are also significant and must be pursued!

Like the dairy industry, genomics will significantly change the landscape of genetic improvement and the resulting beef animals used for production.

Figure 2: Genomics is unravelling the secrets of DNA

Acknowledgements
This world class genomics research would not be possible at the University of Guelph without the funding and research stations (along with their cattle and staff) made possible by the partnership with the Ontario Ministry of Agriculture, Food and Rural Affairs. Funding from the Ontario Cattlemen's Association and the Agriculture Adaptation Council is also gratefully acknowledged. Insights into the impact of genomics on dairy cattle breeding were obtained from Dr. Flavio Schenkel who is leading the research in this area from the Centre for the Genetic Improvement of Livestock at the University of Guelph in conjunction with the USDA, Canadian Dairy Network and funding from NSERC, and L'Alliance Boviteq (Semex Canada).

---------- VB ----------

Dr. Stephen P. Miller
University of Guelph

---------- VB ----------

Getting Paid For Value

Brittney Livingston
Field Service Representative, Beef Improvement Ontario

In these times of uncertainty, consumers are becoming more and more cautious and aware of where their food is coming from. They demand high quality, safe food that is both affordable and healthy. They also have a growing desire to buy local product. Consumers are more environmentally aware and are concerned with the effect that farming practices have, from pesticides and fertilizers to manure storage and treatment of animals. At the same

time, producers are looking to find an edge in a rapidly changing industry. Feed costs are up, the dollar has been unpredictable and changing consumer demands have created a very challenging time for beef producers across all sectors.

In response to this, some beef value chains have started in order to help bring consumers and producers together in the quest for a safe, healthy product in a way that rewards value. Value chains are not new to the agricultural world, but represent a new way of doing business in the beef industry. The beginnings of a value chain involve two or more sectors setting goals and sharing information to help one another attain those goals. Value chains in Ontario to date are at different stages of development. Some are just in the planning stages, while others have begun operation and are moving product and information across sectors.

The creation of these chains allow producers who are focused on quality be rewarded for the extra effort that they are willing to put into their product. These producers know that their product is worth more and they want to be able to market it that way. Before creating a chain, producers should identify what differentiates their product from that of others. It could be quality, taste or simply the customer's experience of buying and cooking the beef. It is important to tell your story as you try to market your beef. As consumers become aware of your particular story, they will be more willing to remain loyal to your brand of beef.

Figure 1: Quality meat means repeat customers for the value chain

It is true that there have been tough times for value chains over the past year - some have grown slowly and continue production while other have succumbed to the challenges of starting a new way of doing business. What is it that makes a value chain successful? Do your homework to insure that your operation will fit with the value chain over the long haul. As producers, you may want to jump in whole-heartedly but it is important to realize that you may not be able to market you entire calf crop through a value chain in the first year. As time goes on and your brand becomes more trusted and recognizable, you will be able to sell more and more meat through your chain. Trust and honesty play a big role to ensure that product is consistent and of high quality. Competitive pricing allows everyone to reap the rewards, however pricing must still allow the chain to sell the meat competitively at the retail level.

Commitment to the value chain will ensure that producers do not abandon ship at times when live prices may be higher than what the value chain can offer. Management is certainly one issue that can make or break a chain. It is important that producers get the appropriate feedback in a timely manner to ensure that they can make management decisions based on the performance of their cattle, whether on the rail or live. Depending on the size of the value chain the sharing of this information can be quite difficult, especially if producers are located throughout Ontario.

Figure 2: as time goes on and your brand becomes more trusted and recognizable

BIO recognises the challenges that producers face and are here to help producers change their business to meet a new reality, including becoming involved in value chains. We have a list of existing and emerging value chains so that we can identify the information needs of these chains. Our focus is on improving the cross sector flow of information so that every member of the chain is knowledgeable and aware of the quality of product they are producing. For example, cow-calf producers need information on the carcasses of their calves while feedlot operators need to know the genetics of the animals that did well in order to be able to source more of the same.

We have tools to help you manage information and meet targets. Information includes age verification, genetic merit for a variety of traits, results of DNA analysis, management information and carcass data. We can facilitate the flow of information through the different sectors of a value chain, connecting all relevant information on each animal from pedigree to cooler. In addition, our

information can be used by producers to select sires that build your herd of the future, one that meets your target.

For more information please call (519) 767-2665 or visit www.biobeef.com.

---------- VB ----------

Brittney Livingston
Field Service Representative, Beef Improvement Ontario

---------- VB ----------

Adding Legumes to Pasture

Jack Kyle
Grazier Specialist, OMAFRA

A pasture containing significant level of legume plants has a number of advantages over a pure grass pasture. Legumes provide nitrogen to promote grass growth, provide high quality forage, and some of the legumes are deep rooted and have some tolerance for the warm dry conditions we generally experience in August.

Productive pastures require regular maintenance. Rotation is one very effective way to improve pasture productivity. Improving the species mix in the pasture is also important. Legumes are the most beneficial species to include in a pasture sward.
There are many advantages to including legumes:

- Legumes add nitrogen to the soil that encourages grass growth as well as supporting legume growth.
- Legumes have more consistent production during the mid summer period. The grasses grow well during May and June but July and August production is decreased. Legumes, particularly alfalfa and trefoil, continue to grow during July and August.

Legumes hold their feed quality longer than grass species. This assists in keeping the pasture quality more consistent throughout the summer grazing season.

The four most common legumes used in Ontario pastures are: alfalfa, white clover, trefoil and red clover. Alfalfa in the most productive of these species but also has several drawbacks. Establishment of alfalfa requires excellent seed to soil contact and very little competition during the seedling stage. Most pastures with a significant level of alfalfa are established through conventional seeding – either planting into a tilled seed bed or no-tilling into a killed sod.

Figure 1: Clover and alfalfa in a dense pasture sward

The clovers and trefoil can be established in a similar manner as the alfalfa or they can be frost seeded or over seeded into the pasture. In an established pasture this is your easiest and likely best option to increase the legume content. Frost seeding is done by broadcasting seeds on frozen ground in late winter or early spring. The best success had been reported with white clover, red clover and trefoil using this method. 1-3 lbs of seed per acre is the generally accepted seeding rate, although there are no hard and fast rules as to the amount, (white clover 1 lb/ acre, trefoil 2-3 lb/acre and red clover 3-5 lb/acre).
The seed should be broadcast when the ground is still frozen - the freeze/thaw action during the spring will help to establish seed to soil contact. This broadcasting can be done with a broadcast seeder on an ATV or snowmobile.

Results are not always evident in the first year, but by the second season you will generally see an increase in the legume content of your pasture. White clover and trefoil can also be mixed in the mineral/salt during the grazing season. The livestock will then spread the seeds across the pasture in their manure. This method may not be as effective but it is low cost.

Increasing the legume content of a pasture will significantly improve the productivity of the pasture and the livestock grazing the pasture.

For further information see the following web sites:
http://www.omafra.gov.on.ca/english/crops/field/news/croptalk/2007/ct-0307a8.htm
http://www.omafra.gov.on.ca/english/crops/facts/98-071.htm

---------- VB ----------

Jack Kyle
Grazier Specialist, OMAFRA
705-324-5855
E-mail: jack.kyle@ontario.ca

---------- VB ----------

Dealing With Deadstock

Ben Hawkins, P.Eng.
Engineer, OMAFRA

If you could choose just one Best Management Practice (BMP) for dealing with livestock mortalities – it would be to eliminate them entirely. Livestock producers regularly review their production and handling practices to reduce the incidence of mortality.

Nevertheless, mortality is inevitable and livestock producers need to equip themselves with knowledge, proper planning and the technology necessary to deal with deadstock.

Presently, under the Dead Animal Disposal Act (DADA), options are limited to collector services, burial, and composting, but with the proposed deadstock regulations new options would open up.

"The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and the Ministry of the Environment (MOE) are proposing that the government replace the current legislative framework regulating the management and disposal of deadstock with new regulations. The DADA and its regulation will be repealed and it will be replaced with 2 new regulations – one under the *Food Safety and Quality Act*, 2001 (FSQA) will address off-farm disposal of deadstock and the other under the Nutrient Management Act, 2002 (NMA) will address on-farm disposal." (**EBR Registry Number:** 010-4842)

What does this mean to producers who choose to dispose of deadstock on-farm?

The proposed regulation not only includes cattle, goats, sheep, horses and swine as per the DADA, but also deer, elk, alpacas, llamas, bison, yaks, donkeys, ponies, rabbits, poultry and fowl, ratites, and fur bearing animals. In other words, the new proposed regulations will include a more complete list of livestock. It sets out standards and regulations for the disposal of mortalities on farm for the purpose of protecting the environment from excess nutrients, pathogens, odours and insects. It also establishes separation distances between disposal areas, neighbours and other livestock. This regulation would apply to all farm operations, regardless of the requirement to have a nutrient management strategy or plan.

The proposed NMA regulation would allow for a number of disposal options, however, regardless of the option chosen, any dead farm animal must be disposed of within 48 hours after death or sooner if the carcass begins to putrefy. Carcasses may be stored in cold storage for as long as 14 days or in frozen storage for as long as 240 days before final disposal.

Disposal options include:

- Collector service
- Composting
- Incineration
- Disposal vessel
- Burial
- Delivery to an approved anaerobic digester
- Delivery to an approved waste disposal site
- Delivery to a licensed disposal facility under FSQA
- Delivery to a veterinarian for post mortem

Each on-farm disposal option will have specific requirements under NMA including a series of minimum separation distances. In addition each will have rules specific to that option.

Collection

- May be picked up at the farm or delivered to the collector
- Pickup area to be kept clean of animal matter after pickup
- Dead animal must be stored so that:
- Prevents liquid from escaping onto the ground
- Protected from scavengers
- Concealed from public view

Figure 1: collection may be picked up at the farm

Composting

- Only one or more of the following materials can be used
- Sawdust, shavings or chips from clean, uncontaminated, untreated wood
- Straw from grain, corn or beans
- Livestock bedding with at least 30% dry matter and containing only allowable composting materials

Hay or silage

- Mixture must be no more than 25% dead animals and no less than 75% substrate by volume
- Piles to be covered with at least 0.6 metres of substrate or a non-compostable, retractable covering that minimizes odours and prevents scavenging
- Composting must continue until no animal matter larger than 25mm and no offensive odour
- Maximum 600 cubic metres of compost or compost material per site
- Maximum 600 square metres per disposal site
- No composting on organic soil or hydrologic soil group AA or A
- Cannot be placed on a flood plain

Figure 2: compost pile

Incineration

- Incinerator type must have been issued a Verification Certificate by ETV Canada certifying that it has a secondary chamber that can maintain the temperatures of the gases entering it for at least 1 second at 1000°C or 2 seconds at 850°C
- No animal matter larger than 25mm remaining at the end of incineration
- Maximum 1000 kg incinerated per 24 hour period
- Incinerator must not be used to incinerate any other material

Figure 3: Incinerator

Disposal Vessels

- Cannot exceed 10 cubic metres
- Must be protected from scavenging
- Must be impervious and leak proof except for at least one vent
- Can be kept on surface of the ground, partially buried or fully buried

Figure 4: disposal vessel

Burial

- No burial in organic soil or hydrologic soil group AA
- 2500 kg maximum weight per burial pit
- Keep dead animal(s) covered with at least 0.6 metres of soil at all times
- Close the burial pit by mounding to a height above ground equivalent to half the pit depth or 0.6 metres whichever is higher.
- Monitor the pit regularly for one year to check for depressions or signs of scavenging

Figure 5: burial pit

On one farm a single method of disposal may be employed while on another the operator may choose to use multiple options.

Proper disposal of the farm animal carcasses is essential. Improper disposal of dead stock poses risks to environmental quality, animal health (in terms of contagious diseases and biosecurity) and public health,

which includes the farm family. It has also been made clear that improper disposal of livestock and poultry mortalities is a sensitive public issue.

Further information on the proposed regulations can be found at: http://www.omafra.gov.on.ca/english/livestock/deadstock/facts/draft_regs.htm

---------- VB ----------

Ben Hawkins
Engineer, OMAFRA
613-475-4558
E-mail:ben.hawkins@ontario.ca

---------- VB ----------

Getting The Cows Ready To Calve and Re-breed!

Barry Potter
Livestock Specialist, OMAFRA

It's the most wonderful time of the year. No, I am not talking about Christmas, but that magical time when the cows begin to drop their calves. And like any Christmas, preparation before the day comes helps make it a truly special time.

Figure 1: Successful cow management produces healthy cows with vigorous calves

The dairy industry talks a lot about transition cow management, the three weeks prior to calving to the three weeks post calving. This is a very critical period in the cow's life. For the beef industry, if we extend the transition period, from two months prior to two months post calving, we can manage the most critical period of a cow's life smoothly.

There are three things to consider in transition beef cow management: sorting, nutrition, and health. The sorting should occur about 60 days prior to calving. Evaluate your cows for body condition score. To see excellent images of both dairy and beef cows, go to this resource on the Ontario Farm Animal Council website: http://www.ofac.org/pdf/body%20condition%20score.pdf

Cows in this period should be in the 3 to 3 ½ score on a scale of 1-5, with 1 being thin and 5 being obese. This puts the cow in a position to gain weight as the fetus grows prior to calving, and then gradually lose condition as she milks the fat off her back. As you look over your cows you may discover some which are under conditioned, in other words, in a 2 to 2 ½ condition score. If possible, these cows should be sorted to provide a higher plane of nutrition with more energy.

Why should you worry about body condition scores on your cows? Cows in better condition have healthier, more vigourous calves. As well, cows in better body condition tend to start cycling earlier after calving. This allows cows to be re-bred more uniformly, providing a more consistent calf crop the following year. The calves from this calf crop will calve earlier, providing heavier calves at weaning.

Table 1 demonstrates the result of higher energy fed to heifers in various body condition scores, and the impact on birth weight and body heat of the calves born. Calves from heifers in body condition scores of 2 ½ or higher in the last 45 days before calving were heavier at birth, and produced more body heat (a sign of a more vigourous calf).

Heifers that calve in good body condition have less dystocia (problems calving). Studies show that the calves will be bigger (5-8 lbs.) but the heifers have more energy to push those calves out. As well, anecdotal evidence has shown that cows which are exercising more prior to calving have less dystocia than cows which are kept in pens. Having cows walk to water or feed provides muscle tone for the entire body, and may help them deal better with the physical stress of calving.

Once cows have been body condition scored, decisions can be made on feeding the 'mommas to be'. Research shows that cows in good body condition which are fed a lower plane of nutrition during the last 60 days prior to calving have more trouble calving than cows that are thin and are fed more energy for the last two months. Table 2 shows the results from one study on the effect of energy intake pre and post partum on the percent of cows in estrus by 60 days post calving, and on weaning weight of the calves. Keeping your better forage for the transition period is definitely a good management decision. Cows in

late pregnancy cannot eat as much because of the calf bed pressing into rumen space, so the ration should be more energy dense. As well, making sure that the cows are receiving a well balanced mineral and salt package, with extra Vitamin E and selenium, helps set the cow up to calve and re-breed.

Table 1: Effect of nutrition during the last 45 days before calving on heifer weight gain and calf health

Trait	Condition Score		
	2	2.5	3
Weight Gain by Heifer (lbs)	48.4	90	136
ADG of Heifer (lbs/day)	1.1	2.0	3.0
BW of Calf (lbs)	80.1	90	85
Calving Ease Score	2.3	2.8	2.2
Heat Production of Calf	Medium	High	High

Table 2. Effects of Pre- and Postpartum Energy Intake on Reproductive Performance. and Calf Weaning Weight*

Prepartum Nutrition	Postpartum Nutrition	Postpartum Interval, days	Percent in Es-trus by 60 d	Calf 205 day Weaning Weight
Low	Low	73	33	409
Low	High	54	56	455
Maintenance	Low	66	53	444
Maintenance	High	68	54	482

*Rick Funston, Montana State University

Another avenue to look at in getting cows ready to calve is health management. Controlling lice prior to calving is recommended. As well, studies show that vaccinating cows for scour prevention can help the calves withstand scours challenge. At this time, you can also vaccinate for respiratory diseases, if your vaccine can be used on pregnant cows (always follow the directions on the label). Clean well-bedded pens, or better yet, clean grass on pasture, reduces the disease challenge for new born calves.

You should review your calving kit to make sure all your tools are ready for the most wonderful time of the year. Proper cow management prior to calving will prevent a lot of headaches during this happiest time of the year on the cow-calf farm!

---------- VB ----------

Barry Potter
Livestock Specialist, OMAFRA
705-647-2086
E-mail:barry.potter@ontario.ca

---------- VB ----------

Food *meets* Function Conference Scheduled for June 17 and 18, 2009, London

Join health professionals, producers, researchers and agribusiness professionals and learn about the latest research and consumer trends in functional foods.
This conference will deliver the latest information on human nutritional science and the healthfulness of functional foods that will be of particular interest for registered dieticians and health professionals. As well, there will be sessions intended for those wanting to learn more about the production, retail and processing aspects of the functional food value chain. Expert speakers will provide key information from the Canadian as well as the international functional food perspective. This conference will examine the exciting advances in this field that support healthy living and put that information into the hands of Registered Dieticians, while the value chain innovators can make use of the information to develop beneficial products and capture new markets.

For more information and to register, go to: http://www.foodmeetsfunction.ca/

Growing Your Opportunities – Quest for New Farm Value Workshops

Are you looking for or do you have a business idea for your farm? Not sure how to make your idea a reality? Local Stakeholders along with the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) are offering up to 20 *Growing Your Opportunities –Quest for New Farm Value* workshops offered throughout the province this winter.

Over 2 days, the participant will identify their specific value-added idea, put their idea into action, find the right market channels, build a business plan, explore how to finance the stages of the business, price the product properly and manage risk. Workshop leaders include Ontario farm business owners, entrepreneurs and advisors who will share lessons learned and best practices.

Limited to only 25 registrants per location, interested participants are encouraged to register as soon as possible. Through the generous sponsorship of the Canadian Farm Business Management Council, OMAFRA and local stakeholders, the 2 day course is being offered at a low rate of $75 per participant. Registration includes 2 fun-filled days of learning, work-book, related print resources, refreshments and lunch.

To register for a workshop nearest you visit: www.ontario.ca/agbusiness or call 1-877-424-1300.

Location	Day #1	Day #2
Rainy River (Emo)	Fri. Feb. 6th	Sat. Feb. 7th
Brussels - Red Meat Focus	Sat. Feb. 7th	Sat. Feb. 14th
Petersburg - Red Meat Focus	Tues. Feb. 17th	Tues. Feb. 24th
Renfrew	Tues. Feb. 17th	Tues. Feb. 24th
Walkerton	Mon. Feb. 23rd	Mon. March 2nd
Clinton	Tues. Feb. 24th	Tues. March 3rd
Simcoe County	Wed. Feb. 25th	Wed. March 4th
Peel / Caledon	Thurs. Feb. 26th	Thurs. March 5th
Port Perry - Red Meat Focus	Sat. Feb. 28th	Fri. March 6th
Niagara	Thurs. March 5th	Thurs. March 12th
Dryden	Mon. March 9th	Tues. March 10th
North Wellington (Arthur)	Tues. March 24th	Tues. March 31st
Cambridge	Tues. March 24th	Tues. March 31st
Ottawa Area	March / April	TBA