Virtual Beef

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Have your say!…There are a number of current and upcoming opportunities for Ontario beef producers to provide input as part of provincial and national surveys. Have your say in these important initiatives. It's an opportunity for you to benchmark your practices against those of other producers. It's also important to have Ontario representation in these datasets to inform outreach activities, policy initiatives and further research. Learn more about how you can contribute to the Benchmark Study of the Canadian Feedlot Industry, the OAHN Survey on Digital Dermatitis, and the BCRC National Cow-Calf Survey. ...cover story

Exploring the effects of over-supplementation on colostrum quality…'Tis the season to discuss the value of colostrum to newborn calves and the factors impacting colostrum quality and quantity. Madi Lewis and a team of University of Guelph researchers have investigated how over-supplementing energy in the ration of late gestation cows affects colostrum production and performance of the calf and dam. Find out what this research uncovered and what it means. …pg 4

Developing an effective feeding program for gestating beef cows…Are your beef cows in late gestation on a feeding program that will set them up for success during lactation, for rebreeding, and beyond? In his article "Feeding the Beef Cow in Late Pregnancy", OMAFRA Beef Cattle Specialist James Byrne outlines some important considerations for effectively feeding beef cows in late gestation and the lasting impact of feeding decisions made during this time. …pg 7

Beyond baking bread: exploring the role of yeast in feedlot rations…Yeast has long been explored as an additive to livestock rations to enhance gut health. Through her research at the University of Guelph, Dr. Melissa Williams has investigated how yeast plays a role in feedlot rations, most recently exploring the impact of yeast supplementation to beef cattle fed high-grain diets with monensin and how yeast affects gut wall permeability. Read on for more details on the study design and findings. …pg 10

Nurturing new arrivals to the feedlot…Have you reviewed your receiving program lately? The spring cattle run is upon us, marking a great time to review and reflect upon practices that set cattle up for success in the feedlot from the start. This article by OMAFRA Beef Cattle Specialist, Megan Van Schaik, highlights some key practices to consider as part of a receiving program that can help achieve a smooth transition for new arrivals. …pg 11

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Direct general questions and suggestions to: Megan Van Schaik, Editor at megan.vanschaik@ontario.ca or call 519-820-4175. For inquiries regarding content of a specific article contact the author.

Ministry of Agriculture, Food & Rural Affairs

Ontario

Coming Soon: The Canadian Feedlot Benchmark Study

Megan St. Martin, University of Guelph M.Sc. candidate

The Canadian Feedlot Benchmark Study is creating a national benchmark database of feedlot and backgrounding practices. Benchmarks allow producers to compare their practices to other operations across Canada. Since the results of this study will guide future extensions and research activities on best management practices and will be used as a baseline for future Canadian beef industry Life Cycle Assessments, having Ontario data as part of the Canadian dataset is important, so that the Ontario feedlot industry's needs are captured.

The first phase of the study will include a survey for feedlot operators to complete, focusing on feedlot operations, feed management, feed milling, feed additives and implant programs, and ration composition. Each participant will receive a personalized and confidential report of how their operation's practices compare to the Canadian benchmark.

The second phase of the study will include a sampling trial at feedlots across Canada and developing Near-Infrared Spectroscopy (NIRS) fecal calibrations according to feed management practices, cattle performance, and feed sources. This will allow for more rapid, robust and accurate testing of fecal samples to identify fecal composition. Enhancing fecal testing has the potential to improve precision feeding, increase feedstuff flexibility, and improve cattle efficiency and productivity.

Producers who participate in the second phase of the study will receive farm specific NIRS results from the study. Results from improved NIRS prediction equations are expected to help producers improve efficiency and on their feedlots, improve feed efficiency, reduce input costs, and reduce the environmental impact from their operation.

The survey will launch in Spring 2024. Feedlot operators in Ontario will be able to access the survey through OMAFRA's Dairy and Beef Cattle Blog (https://dairyandbeef.wordpress.com/) and Beef at Guelph (https://beefguelph.ca) as well as the study's main website (https://research-groups.usask.ca/feedlotbenchmark/).

If you would like to be involved in Phase II of the study (on-farm sampling) or for more information about the survey in general, contact us:
Katie Wood – Associate Professor at the University of Guelph kwood@uoguelph.ca (519) 824-4120 ext. 53695
Megan St.Martin – Msc Candidate at the University of Guelph, Ruminant Nutrition stmartim@uoguelph.ca
Megan Van Schaik – Beef Cattle Specialist with OMAFRA megan.vanschaik@ontario.ca

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Megan St. Martin, University of Guelph M.Sc. candidate
stmartim@uoguelph.ca

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Ontario Animal Health Network Survey on Digital Dermatitis

The OAHN Bovine network has launched a survey to better understand the presence of digital dermatitis on Ontario feedlots and actions producers are taking for its control.

Digital dermatitis is a painful foot condition causing lameness in cattle. The disease is characterized by painful lesions on the feet. Initially, lesions are raw, red, circular ulcers with a strawberry appearance. Chronic lesions may extend up in between the claws and develop hair-like projections with a warty appearance. Other common names for digital dermatitis are strawberry foot-rot and hairy heal wart.

The questionnaire will ask about the presence of digital dermatitis on your farm and its impacts. This information is being collected and analyzed by the bovine Ontario Animal Health Network (OAHN), which is dedicated to early detection and response to emerging diseases.

All responses will be kept confidential and results from the project will only be released as a summary of all responses. The survey should take approximately 10-15 minutes to complete.

The survey can be accessed at: https://uoguelph.eu.qualtrics.com/jfe/form/SV_eEe4EF0CxnDitzo
Or via the QR code below.

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OAHN Bovine network

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Canadian Cow-Calf Survey 2023-24

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BCRC National Cow-Calf Survey

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Does length of prepartum energy supplementation impact colostrum quality and quantity?

Madi Lewis, Katie Wood, Koryn Hare, & Michael Steele

Introduction

Late gestating beef cattle experience increased nutrient demands during the final two month prior to calving due to exponential fetal growth (Bauman and Currie, 1980). In these final two months, the fetus will gain approximately 60% of its birthweight, and mammary gland development is occurring as the dam prepares for production of colostrum and lactation (Bauman and Currie, 1980). The process of colostrum production relative to calving is not well understood. Previous work has shown that cows supplemented with excess energy prior to calving experience minimal calf size effects, an increase in colostrum quality and output, and minimized condition loss (Bauman and Currie, 1980). Based on previous studies, late gestation metabolizable energy over-supplementation could cause different responses depending on the duration of supplementation relative to time of calving.

Objective

Given the expense of supplementation with commodities such as corn, it is important to investigate the effect of duration of supplementation on cow and calf performance, as well as colostrum yield and quality (Baumrucker & Bruckmaier, 2014).

The objective of this study was to investigate how supplementing more metabolizable energy than the cows' requirement for 3 compared to 6 weeks would impact colostrum quality and quantity and cow and calf performance. It was hypothesized that over supplementation of metabolizable energy 3-weeks prior to parturition would be as beneficial to colostrum production as supplementing for 6 weeks.

Methods

This study took place at the Ontario Beef Research Centre (OBRC, Elora, ON, Canada) with a total of eighty-two gestating Angus-Simmental beef cows. Cows were assigned groups by predicted calving date based on an estimated gestation length of 282 days and body weight. Prepartum, the cows were housed by treatment in pens of 6 animals; each pen shared three Insentec Feeding Systems, which allowed for individual feeding behavior and intake to be recorded.

Cows were assigned to one of three treatment diets: (1) 100% metabolizable energy requirement (Table 1, CTRL, 24 cows), (2) 120% of their predicted metabolizable energy requirements for 3 weeks prior to calving (Table 1, 3WK, 30 cows), or (3) 120% of their predicted metabolizable energy requirements for 6 weeks prior to calving (Table 1, 6WK, 28 cows).

The cows weighed an average of 715 kg with a body condition score of 3.5, with an average parity of 3.2 years at 270 days of gestation. Changes in metabolizable energy between treatment diets was achieved through the inclusion of whole corn for the 3WK and 6Wk treatments. Cows were placed on a two-week adaptation period prior to the start of the treatments, during this time they were fed the control diet. After calving, all cows were fed a common lactation ratio and were fed free choice.

Cows on the 3WK treatment were fed the treatment diet starting at roughly13 days prior to calving. Cows on the 6WK treatment were fed treatment diet starting at roughly 33 days prior to calving.

To keep track of performance during gestation, cow weights, ultrasound for rib and rump fat, and blood samples were collected from cows. At time of calving, cows had a full-udder of colostrum which was collected with a portable milking machine. Postpartum, weights, ultrasound and blood samples were collected from the cows to track their performance. Calf birth weights were also recorded at birth and calves were weighed weekly thereafter. A blood sample was obtained at about 48 h of age to assess passive transfer of IgG antibodies.

Table 1. Prepartum diet ingredient inclusion, chemical composition and feeding rate designed to supply pregnant cows with 100% (control) or 120% of their predicted ME requirements for 3 weeks (3WK) or 6 weeks (6WK) relative to calving.

Item	Control	Treatment
Feeding rate, DM %BW	1.4	1.45
Diet composition, %DM		
Haylage	5	5
Corn Silage	5	5
Chopped Dry Hay	37.5	44.5
Wheat Straw	30	5
High Moisture Corn	18.5	18.5
Whole Corn	0	18.5
Urea	0.5	0
Vitamin and Mineral Premix	3.5	3.5
Forage, %DM	77.5	59.5
Concentrate, %DM	22.5	40.5
DM, %	80.86	80.76
Chemical composition, %DM		
CP	10.62	10.83
Soluble protein	4.19	2.77
aNDFom	51.91	36.78
Sugar	3.09	3.32
Starch	14.95	26.98
EE	2.57	3.02
Ca	0.66	0.66
P	0.34	0.41
Mg	0.25	0.26
K	1.57	1.64

DM = dry matter, CP = crude protein, aNDFom = amylase Neutral Detergent Fiber organic matter, EE = ether extract

Results

Cows calved earlier than anticipated, resulting in an average of 14 d and 33 d before calving, The results of this study did not find any differences in colostrum yield ($P = 0.9$) or composition (fat, crude protein, lactose, glucose, or gross energy; $P > 0.3$) because of supplementation, nor were there differences due to duration of supplementation of energy relative to control diets at 100% of ME requirements (Figure 1). Total IgG concentration in colostrum was also not impacted by dietary treatment ($P = 0.8$).

Supplementation also did not impact cow performance measurements before calving, as supplemented cows had similar rib and rump fat depth, and similar body weight ($P > 0.4$). Greater levels of metabolic markers of fat mobilization were seen in the control cows, suggesting that these cows may have had to use more body reserves to meet their energy demands, although the insufficiencies did not impact overall performance. Similarly, up to 63 d postpartum, there were no dietary treatment differences in cow bodyweight or rib and rump fat measurements ($P > 0.5$). However, cows supplemented for 3 and 6 wks prepartum had positive bodyweight gain over the entire study (-53 to 63 d ; 9.4 and 18.5 kg respectively; $P < 0.001$), while control cows lost approximately 11 kg body weight, despite being fed the same diet postpartum.

There were no treatment differences for calf birth weights ($P = 0.3$). Interestingly, calves from cows that were supplemented for 6 weeks did have greater average daily gain for the first 7 days of life compared to cows that were supplemented for 3 weeks (1.64 vs 1.24 kg/d, respectively; $P = 0.02$), while control remained intermediate. After the first 7 days of life, calf weights and average daily gain were not affected by maternal supplementation ($P = 0.3$)

Conclusion

The results of this study did not support the initial hypothesis that over-supplementation of metabolizable energy for durations of 3WK or 6WK prior to calving would affect colostrum production and calf performance differently, due to being applied at differ stages of colostrum production relative to cow supplemented at 100% of requirements. However, supplementation did improve body weight gain in cows, which may be beneficial to producers prior to breeding.

As cows in this study calved earlier than expected, the much shorter duration of supplementation of 33 and 13 days could have limited differences seen relative to the hypothesis; prolonging the duration of supplementation closer to our target duration may change results. This would aid the beef industry to discover the most ideal time period for metabolizable energy supplementation to improve both cow and calf performance, while optimizing colostrum yield and composition.

I would like to thank the Elora Beef Research Centre Staff, Amber Zupan, and Tatum Schooley, and Dr. Katherine Wood's lab for their technical support on this project. Funding for this study was provided by the BCRC, OMAFRA and NSERC

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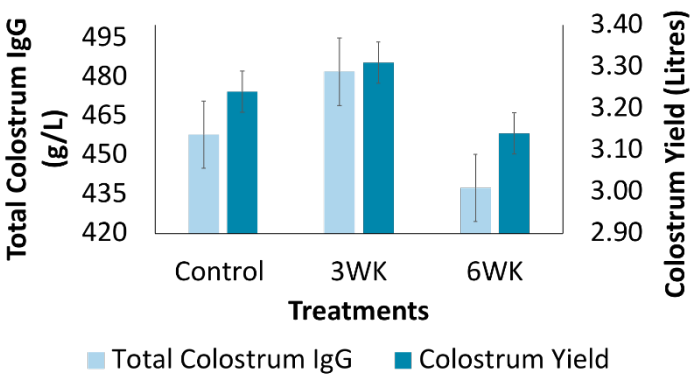

Figure 1: Total colostrum IgG concentration and Colostrum yield of cows fed 120% of metabolizable energy requirements for 3 or 6 wks prior to calving relative to controls fed 100% of metabolizable energy requirements.

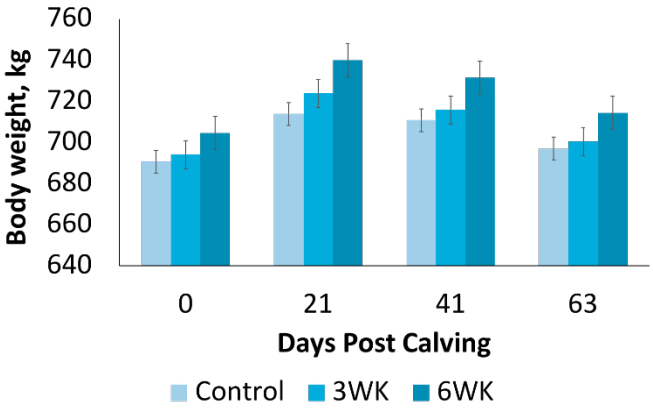

Figure 2: Post-calving body weights of cows fed 120% of metabolizable energy requirements for 3 or 6 wks prior to calving relative to controls fed 100% of metabolizable energy requirements.

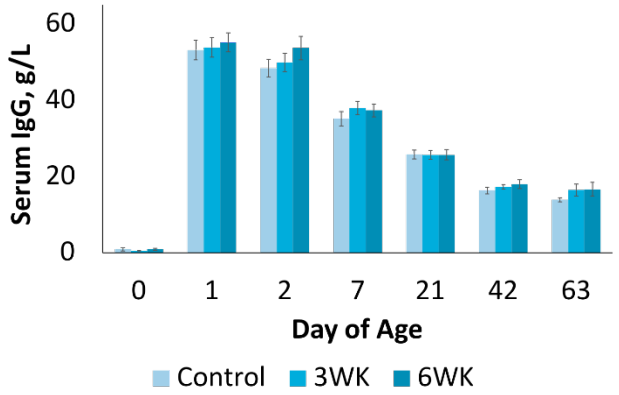

Figure 3: Calf serum IgG concentrations from cows fed 120% of metabolizable energy requirements for 3 or 6 wks prior to calving relative to controls fed 100% of metabolizable energy requirements.

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Madi Lewis, Katie Wood, Koryn Hare, & Michael Steele
University of Guelph

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Feeding the Beef Cow in Late Pregnancy.

James Byrne, Beef Cattle Specialist, OMAFRA

The third trimester (months 6 to 9) of a beef cow's pregnancy is the most important time during the feeding period. During the last 3 months of pregnancy, her requirement for energy increases by 34% from 12.6 Mcal/day at the end of the 6th month of pregnancy to 16.9 Mcal/day in her 9th month of pregnancy, see table 1. Most of this increase comes from the energy required for pregnancy which jumps from 1.4 Mcal/day at the end of the 6th month of pregnancy to 6.2 Mcal/day in the 9th month of pregnancy, an almost 450% increase in energy demand. These figures assume the pregnant cow is in good body condition (body condition score = 3) and sheltered from the cold and wind. Beef cows with a lower body condition score and/or being fed outdoors will have a higher energy demand than mentioned above.

Table 1. Net Energy Requirements of a Pregnant Beef Cow in 2nd and 3rd trimester, (1,210 lbs., Body Condition Score = 3).

Months Pregnant	4	5	6	7	8	9
Net Energy Required, Mcal/Day						
Maintenance	10.5	10.5	10.5	10.5	10.5	10.5
Pregnancy	0.4	0.7	1.4	2.4	4	6.2
Lactation	1.6	1.1	0.7	0.5	0.3	0.2
Total	**12.4**	**12.3**	**12.6**	**13.4**	**14.8**	**16.9**

Adopted from NRC Nutrient Requirements of Beef Cattle

It is critical that the energy demands described above are met by providing her with a diet that meet these requirements. Failure to provide sufficient energy in the diet at this time can lead to weight loss, challenges at calving, poor colostrum and milk production, reduced calf thriftiness and a longer post natal interval before the cow will be ready to breed.

During the last 3 months of pregnancy beef producers should be feeding their “best” quality hay or other forage type. Forage sampling is critical to determine what “best” quality is. Ideally forage sampling should be completed well in advance of feeding so the quality of the feed to be fed can be determined and any supplementary feed, if needed, can be readied. Lower quality forage should be targeted to those beef cows in the 2nd trimester, where their energy requirements are lower. The importance of portioning out your hay supply based on its quality is a very important management tool. Doing so ensures that the lower quality forage goes to those animals that have lower feed requirements and the higher quality forage is reserved for those animals that really need it. Assuming that there is enough of both lower and high-quality forage available to meet herd demands, this will have the effect of keeping costs to a minimum.

A 50-cow beef herd (assuming average 1,200 lbs beef cow) will consume approximately 108,000 lbs. of “lower” quality hay in the 2nd trimester and an equal amount of high-quality hay in the 3rd trimester. Knowing what’s in your hay inventory at the start of the winter-feeding period and periodically throughout the winter-feeding season will ensure your hay inventory is managed correctly. In this simple example the hay supply is split 50:50 between “lower” quality and “higher” quality. In this situation and assuming the “higher” quality hay is sufficient to meet the herd’s requirements in the last trimester, no additional feed should be required, so the feed cost to the producer is simply the cost to produce the forage and the labour to feed it out.

However, in the event that the hay inventory splits 60:40 in favour of the lower quality hay, the effect will be to force the producer to feed some lower quality hay for some period of time of the 3rd trimester. To offset any nutritional deficiencies, supplementary feed may be required, which adds to the winter feed costs.

For those feeding their cows outdoors, the effect of climate must be considered. As a rule, beef cows acclimatize to the cold very well. As fall turns to winter and the days get colder, beef cows grow long hair and lay down a layer of adipose tissue beneath the skin. Long hair traps more air close to the body, which acts like insulation. Maintenance requirements increase by 1% for every degree below 0° C. An 8th month pregnant beef cow at 0° C requires 14.8 Mcal/day of energy but at minus 20° C will require 17.76 Mcal/day of energy in the diet. Hay alone is unlikely to meet such an energy requirement and so some supplementary feeding will be required. The energy demands described are based on a beef cow that is kept dry and sheltered from the wind. If the coat is wet or muddy, maintenance requirements increase by 2% for every degree below 15° C. So even at 0° C, a muddy or wet coated animal can have a significant increase in energy requirement.

Body condition score plays a highly important role in the energy requirements of late pregnant cows. To minimise calving difficulties and maximise both calf performance and subsequent breeding performance, cows should calf down at a body condition score of 3. A significant body of research has shown the negative effects of cows calving in poor body condition (i.e., less than a score of 2.5) or being overfat at calving. Correcting for body condition score should begin at the start of the winter-feeding season and cows should be monitored for body condition on a regular basis over the feeding period. Any cows that show signs of losing weight should be removed from the main herd to a smaller, higher feed group. This is especially important for 1st calf heifers,who should not be fed with mature cows, and for mature cows in their 2nd pregnancy.

Cows that become thin during the 3rd trimester present a feeding challenge. If these cows can be identified as getting thin early in the third trimester, (i.e., month 7 of pregnancy), there may be an opportunity to return them to good body condition with a modest amount of supplementary feeding, which will not be detrimental to calving. Cows that get thin later in the 3rd trimester cannot be fed a high enough energy diet to restore them to good body condition without causing issues at calving. Very high energy diets fed to cows in late pregnancy can result in the deposition of fat in the birth canal, leading to calving difficulties. In this case, it is best to feed a diet sufficiently high energy and accept the fact that the cow will calve down in less than ideal body condition.

The protein requirements of late pregnancy cows are around 690 grams per day of metabolizable protein, see Table 2. This rate is about 24% higher than seen with cows in their 2nd trimester. Fortunately, supplying adequate protein to meet demand is relatively simple. As an example, a 10% crude protein mixed hay (TDN = 60%) will provide an excess of protein for a beef cow in her 2nd trimester and meet her protein requirements late in her 3rd trimester. Where protein requirements are inadequate, this is easily correctly through supplementation with high protein by-products (e.g., corn distillers' grains). As with energy, the protein supplied in the diet should be accounted for through a forage test and as described above, forages with lower protein levels should be targeted to those cows in mid pregnancy whereas higher protein forages should be targeted to those cows in later pregnancy.

Table 1. Protein Requirements of a Pregnant Beef Cow in 2nd and 3rd trimester, (1,210 lbs., Body Condition Score = 3).

Months Pregnant	4	5	6	7	8	9
Metabolizable Protein Required, Grams/Day						
Maintenance	432	432	432	432	432	432
Pregnancy	14	27	50	88	152	251
Lactation	114	78	53	35	23	15
Total	**560**	**536**	**534**	**555**	**607**	**697**

Adopted from NRC Nutrient Requirements of Beef Cattle

Forage analysis is necessary to determine the mineral requirements of late pregnancy cows. Calcium and Phosphorus requirements increase by 21% and 14% respectively from 6th month of pregnancy to the 9th month of pregnancy. However, the requirement for calcium and phosphorous increases by another 25% by the 2nd month post calving, driven by the need for these minerals in milk production. Producers should consult with their nutritionist to determine the correct mineral to be fed that matches their unique requirements and supply.

Meeting the nutritional requirements of late pregnancy beef cows is critical so that cow's calf in good body condition score, deliver a healthy calf that thrives and enables those cows to go back in calf as soon as practical. The key to achieving this is timely forage analysis, an understanding of the on-farm forage inventory accounting for the results of the forage analysis, the distribution of the forage to beef cows at the correct stage of pregnancy to meet both protein and energy requirements and, where necessary, providing supplementary feeding to balance out any deficiencies.

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James Byrne, Beef Cattle Specialist

Ontario Ministry of Agriculture, Food & Rural Affairs

james.byrne@ontario.ca

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Does Yeast Supplementation in High-Grain Feedlot Diets Help with Recovery from Induced Ruminal Acidosis Challenge?

Dr. Melissa Williams, University of Guelph

Introduction

In the feedlot, cattle are fed high-grain diets to help them reach market weight quickly; however, the large amount of grain fed in the diet does have its downsides. One downside is the increased risk of ruminal acidosis caused by a reduced ruminal pH, which in turn can damage the gut wall. With increased damage to the gut wall bacteria make their way to the liver and colonize to form an abscess, reducing carcass value at slaughter. Since damage to the gut wall increases the wall permeability, harmful molecules can enter the bloodstream. This invasion can activate the animal's inflammatory systems, which can draw energy away from growth. Therefore, reducing gut wall damage by a high-grain diet is an opportunity to improve overall animal health and productivity in the feedlot.

Yeast, similar to that which is used to make bread at home, has been heavily researched for many decades as a feed additive in the dairy industry and less so in the beef industry. In dairy cattle, yeast supplementation has improved the gut environment and animal health. However, with so many variations of yeast supplement product types and strengths and differences in animal and diet types used in experiments, animal responses can be inconsistent in the abundance of studies. Very little research has examined yeast supplementation in beef cattle fed high-grain diets with monensin, none of which assesses the impacts of yeast on the permeability of the gut wall.

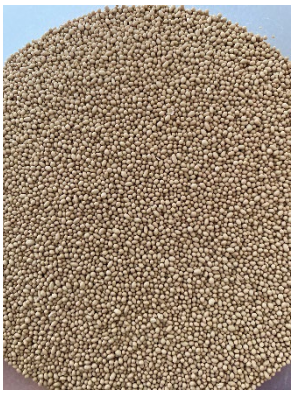

Figure 1: Active live yeast supplement.

What did we do?

This experiment was conducted at the University of Saskatchewan in the Livestock Research Barn from February to May 2022. This experiment aimed to examine the effects of supplementing live yeast to finishing cattle on a high-grain ration on feed intake and behaviour, gut pH trends, gut wall permeability, and immune response in the event of an induced reduction of gut pH (acidosis). This was done by adapting cattle to a diet containing 83% (on a dry matter basis) steam-flaked corn and then inducing a ruminal acidosis challenge to reduce gut pH. The challenge was conducted by introducing a large amount of barley pellets into the gut through a rumen cannula (Figure 2) that would readily be digested and cause the pH to drop.

Figure 2: Rumen cannula: a porthole-like device that allows access to the rumen.

Before, immediately after, and up to 15 days after the challenge, measurements were taken to assess feed intake and behaviour, rumen pH and fermentation through measurement of volatile fatty acids (VFAs), gut wall permeability, and immune response. Feed intake and sorting behaviour were measured using samples of daily feed refusals, and immune response was measured as concentrations of inflammatory markers in the blood. Gut wall permeability was evaluated by adding markers in 2 locations of the gastrointestinal tract (rumen, omasum) via the rumen cannula, allowing it to pass through the gut wall and into the bloodstream to be measured. An increase in the marker appearing in the blood indicates increased gut wall permeability and, therefore, likely increased gut wall damage. Infusing the second marker in the omasum allowed us to assess differences in permeability in the entire gut and just the hind gut.

What did we find?
It was found that yeast supplementation did not impact any of the outcomes that were measured. Therefore, the live yeast supplementation did not affect feed intake or particle sorting behaviour, gut pH or volatile fatty acid concentrations, gut wall permeability or immune status. There were no differences in measurements after the acidosis challenge suggesting that relative to diet containing monensin, yeast supplementation did not improve recovery from acidosis in this study.

What we did find was that regardless of treatment group, cattle that adapted to a high-grain diet experienced a temporary reduction in feed intake, gut pH, and immune response markers in the blood when subjected to acidosis. These cattle each recovered somewhere between 2- and 15-days post-challenge. The hind gut marker of permeability was highest during challenge and was lowest in recovery period three -15 days after acidosis challenge.

What does this mean?
The results of this experiment suggest that for cattle adapted to a high-grain diet, the supplementation of live yeast does not play a role in the recovery of gut wall permeability or gut pH after an acidosis challenge. It is thought that perhaps the expected impacts of yeast that guided the experiment's hypothesis are circumvented by the adaptation to a high-grain diet containing monensin in the first place. The prevalence of monensin in all diets also may also be masking yeast effects. However, regardless of treatment, it took up to 15 days for animals to recover from the acidosis challenge. Further research into the similarities and differences between gut changes related to high-grain diet adaptation and yeast addition to low and high-grain control diets would be required to confirm this theory.

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Dr. Melissa Williams, University of Guelph
mwilli20@uoguelph.ca

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Nurturing the New Cattle on the Block: Setting cattle up for success when they arrive at the feedlot

Megan Van Schaik, Beef Cattle Specialist, OMAFRA

Although the fall calf run represents the busiest time of year for feedlots to fill pens, spring tends to be another busy time for cattle movement in Ontario. Special stocker sales are scheduled throughout the spring season. Some of these cattle are destined for pasturing over the grazing season whereas others are destined for finishing in a feedlot. Cattle transitioning into a new feedlot setting marks an important time for dialing in on best management practices in the feedlot – whether in the fall, spring, or any other season.

Taking the time to nurture newly received cattle and support them in transitioning to a new environment pays dividends throughout the feeding period. Whether feedlots are receiving recently weaned calves or stockers coming out of a backgrounding program, the goal of a receiving program is to have cattle maintain feed and water intake upon arrival, to prevent health issues from taking hold during this high-risk time of the production cycle, and to make the transition to the feedlot as smooth as possible. This article will highlight a few key considerations for supporting cattle in the transition to the feedlot.

Understanding the background of incoming cattle

- There is no 'one size fits all' receiving program. Understanding the background of incoming cattle can help a feedlot operator understand the risk profile of a group of cattle and tailor receiving programs accordingly.
- Generally speaking, preconditioned calves are less likely to develop disease and are better equipped to transition to a feedlot setting. Since 'preconditioning' is a general term to describe a set of practices applied to calves destined for a feedlot, just knowing that calves were preconditioned is not enough. Preconditioning programs may or may not include dehorning, castration, bunk training, vaccination, and low stress weaning. It is important to know which practices are adopted in a preconditioning program, where possible, as these details should inform purchasing decisions and receiving programs.
- Knowing the vaccination and treatment history of a group of cattle can help inform a health program at the feedlot.

Preparing for new arrivals, reducing stress upon arrival, and observing cattle behaviour

- Reducing stress in cattle during their journey to the feedlot goes a long way in helping cattle transition to a new feedlot environment. Avoiding over-crowding on trucks, providing ample bedding, practicing low-stress handling, and having experienced drivers are a few ways to reduce stress during transportation.
- Similarly, handling stress should be minimized when cattle are received at the feedlot and are processed. Ensure cattle handling facilities are designed properly, in good repair and working effectively prior to cattle arriving at the feedlot. Provide good footing on loading ramps and in receiving areas to avoid slipping. Keep the noise level as low as possible.
- Ensure pens and equipment are clean, well maintained, and ready for a new group of cattle. Provide ample fresh bedding to encourage rest.
- Closely observe cattle and their behaviours upon and after arrival for health, condition, and general quality.
- Assessing and categorizing risk for new arrivals can help cattle feeders develop effective health protocols and feeding programs in conjunction with their veterinarians and nutritionists.
- Keeping incoming cattle in the same pens for the first few weeks may help reduce stress and health challenges associated with commingling and pecking order.

Feeding considerations

- Consider offering cattle long-stemmed hay when they arrive at the feedlot. For younger calves, stretch out this period of hay feeding and gradually transition them onto a TMR. Offering long-stemmed hay upon arrival is a great starting place for cattle and will encourage intake and gut-fill at a time when intakes can be depressed. Ensure feed is fresh, of high-quality, and palatable. Some recently weaned calves may not have been exposed to fermented feeds prior to entering the feedlot, so offering familiar feedstuffs will help them become familiar with the bunk and consuming feed.
- Gradually step-up starch/energy in the ration to allow time for cattle to adjust to high-grain rations. Work with your nutritionist to develop a step-up program for each group of cattle arriving at the feedlot. An effective step-up program is designed to avoid digestive upsets while achieving desired gain.
- Ensure roughage/effective fibre levels in the ration are appropriate for the stage at which incoming cattle are in a feeding program. Having adequate roughage in the ration in the days after receiving helps maintain intake and transition cattle to a new feeding program.
- Natural protein supplements with sufficient levels of rumen undegradable protein are more effective in meeting protein requirements of young calves compared to urea.
- Manage particle size of feed ingredients offered in the ration. Particle size can influence digestibility and gut health. It's important to avoid exposing cattle to a high proportion of fines which can put them at higher risk of digestive upsets.
- Provide adequate bunk space for newly received cattle. Target 16"-18" of space along the bunk per head of cattle. Bunk space requirements are higher for growing vs finishing cattle.
- Observe feeding behaviour at the feed bunk and implement sound bunk management strategies from the start. Observing how cattle behave at the feed bunk can help identify pen health issues. Monitoring feed

disappearance can prevent bunks from running empty and bunk scores can be recorded to establish trends in dry matter intake.

- Observe manure consistency as an indicator for digestive upsets.

Figure 1: This receiving pen is designed so that new arrivals have access to both hay feeders containing long-stemmed dry hay (along the sides of the pen) and a feed bunk where the starter TMR is fed (at the front of the pen).

Water

- Cattle should have access to an abundant source of clean water as soon as they arrive. Providing access to clean water is important in preventing dehydration and encouraging feed intake.
- Make sure water bowls/tanks are clean and free from feed particles, manure, algae, etc.
- Young cattle may need help finding the waterer in the pen.

Processing and cattle health

- Cattle should be given time for rest, feeding, and watering prior to initial processing, especially for extremely stressed and high-risk cattle.
- Watch for signs of illness – observe their behaviours and take temperatures of cattle with suspected illness. Move sick cattle to a sick pen and provide treatment as advised by a veterinarian.
- Work closely with your veterinarian to develop a plan for vaccinations and parasite control.
- Consider control mechanisms for coccidiosis upon arrival.

Cattle moving from one environment to another can be inherently stressful. Luckily there are many strategies that can be employed to minimize stress on cattle and get them settled into the feedlot quickly. Reviewing receiving practices, training employees, preparing for new arrivals before they reach the feedlot, observing cattle upon arrival, and working with a team that includes your nutritionist and veterinarian can help make the transition to the feedlot as smooth as possible.

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Megan Van Schaik, Beef Cattle Specialist
Ontario Ministry of Agriculture, Food & Rural Affairs
megan.vanschaik@ontario.ca

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