

# OMAFRA Virtual Beef

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## Do Your Cattle Have "Attitude" ? ...and how to measure it

Tom Hamilton

Beef Program Lead- Production Systems, OMAFRA

Cattle behaviour is an important, but often overlooked trait. Everyone who handles cattle will have a few stories about animals that exhibited "crazy" behaviour, hopefully not including any injuries to people or animals. While these extreme situations live on in our memories, cattle exhibit a whole range of behaviours when handled, from being very docile to showing moderate signs of stress (like some head bobbing), to more dramatic actions such as continuous bouncing and kicking (like a teenager deprived of their smart phone). Calm cattle are much easier to work with and more likely to get their vaccines, implants, tags and other procedures applied properly ... you can only wait so long for the animal to settle down! Research has also found that cattle which have a calm temperament perform better in the feedlot than those with wild temperament, so there is an economic benefit to having calmer cattle.

One of the most common methods of measuring cattle temperament is chute scoring. An observer stands back and evaluates the behaviour of an animal during the time it is in the scale or headgate, and assigns a score based on the amount and type of movement exhibited by the animal. An example of a



Calm feedlot cattle have better gains.

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**Table 1. Chute scoring definitions<sup>1,a</sup>**

Chute Score	Behaviour Criteria
1	Very little or no movement
2	Low amplitude movements or $\leq 2$ vigorous kicks or shakes
3	More than 2 violent/vigorous kicks, shakes, jumps etc.
4	Nearly continuous violent movements (some brief pauses)
5	Continuous violent movements (no pause)
<sup>a</sup> Sebastien et al, based on work by Grandin	

chute scoring system is shown in Table 1. Chute scores are useful, repeatable measurements of cattle temperament, but they require extra labour during processing (already a busy time!) and work best when always done by the same person. This is because they are subjective evaluations, and different people will score behaviour somewhat differently.

A recent study by Thomas Sebastien and coworkers at the University of Saskatchewan compared the subjective scorecard method (Table 1) of evaluating temperament with 3 objective methods. These methods were i) using a strain gauge on the headgate to measure pressure exerted by the animal, ii) using chute exit time to measure the speed with which animals left the headgate, and iii) a movement measuring device which collected and analysed data from the load cells on an electronic scale. Four hundred steers were handled three times, at two month intervals. As part of the experimental procedure, each animal had its ear handled while in the headgate. Based on coat colour, the steers represented a mixture of common breeds and breed crosses.

The researchers found that overall, the objective measurements were correlated with each other, showing that they were measuring different aspects of the same underlying trait. However, they also found that some of the average levels of the measurements were different between the three handling times, with cattle showing increased stress during the 2<sup>nd</sup> handling procedure compared with the 1<sup>st</sup> and 3<sup>rd</sup> handlings. It appeared that animals going through the chute for the 2<sup>nd</sup> time after a two month feeding period did not benefit from familiarity with the procedure.

Subjective scoring (based on visual observation) was also correlated in general with the objective measurements (strain force, exit time, and load cell measures). This showed that both the chute scoring system and the mechanical/electrical measures were evaluating different components of the animals' underlying temperament. However, the authors point out that objective measurements provide an advantage by eliminating observer bias and thus may be better tools for temperament selection.

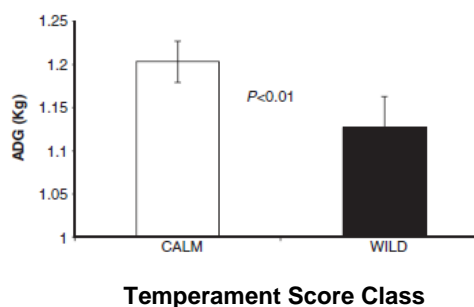
Since most of the chute scores were between 1 and 3, with few 4s and 5s recorded, the researchers divided cattle into 2 groups: i) calm, with scores of 1 or 2, and ii) wild, with scores of 3, 4 and 5. They found that most of the objective measures were statistically different between the 2 groups, for each handling



event. They then compared cattle growth performance between the "wild" and "calm" groups. They found that the calm cattle had a significantly higher average daily gain (ADG) than the wild cattle (2.64 lbs/day compared to 2.47) (see Figure 1). This indicates that animals which have a "poor attitude," and are more excitable when handled, are also more likely to be poor performers in the feedlot.

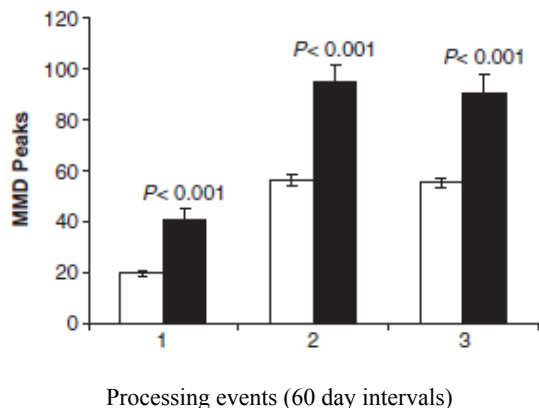
Surprisingly, exit speed out of the headgate was not correlated with ADG. The authors indicate that this does not agree with earlier studies, and may be due to differences between beef cattle species [*Bos taurus* in this study vs. *Bos indicus*] or other factors. Similarly, strain gauge measures were not correlated with ADG either. The only objective measurement related to ADG was movement in the scale (measured by load cells), which had a significant negative correlation to ADG (see Figure 2). This means that cattle which exhibited relatively vigorous movement when restrained gained less during the feeding period.

The movement of cattle restrained in electronic scales, recorded and interpreted by a special device, could be used to predict behaviour-related differences among cattle for feedlot ADG. It could also be used to cull out wild cattle early on in the feeding period, or possibly prior to purchase. Since ADG has economic value, this measure could be used to help estimate differences in profitability among feedlot cattle. It could also be included in genetic evaluation programs, especially performance tests of young beef bulls.

Not only are cattle with the right attitude easier to handle, they also perform better in the feedlot!

**Figure 1. Relationship of temperament score and gain<sup>1</sup>**

**Figure 2. Movement measuring device peak readings for calm  and wild  steers.<sup>1</sup>**



ground. The seeding rate was 10 lbs per acre. By early June it was evident that red clover now made up 50 % of the forage stand or greater in areas where previously there was no legume.



**Figure 1: Frost seeding can introduce legumes to improve pasture quality**

In 2011, red clover was spread in additional fields. This time the rate was cut to 5 lbs per acre, and the grass was not grazed off in the fall. Evaluation in the summer demonstrated that the red clover per cent increased only marginally (less than 15 %.)

Frost seeding is a concept that has been around for quite a while. The process imitates the natural process of seed heads shedding mature seed from plants onto the ground in the fall. While forage seed can be spread at any time, typical frost seeding now occurs in late winter/early spring. Farmers are afraid that seed spread in the late fall could germinate in a winter thaw, or be washed away in a spring melt. So usually the seed will be spread on the last melting snows of winter, or the frozen ground of an early spring day. The subsequent morning freezing and afternoon thawing works to lower the seed into the soil, ready to germinate in a sustainable environment as the soil temperature warms.

Frost seeding is especially beneficial in areas where the pasture or hay field has “run out” of legumes. Legumes provide extra yield, and quality in the field, as well as taking nitrogen from the air, and making it available in the soil for grass roots to use.

Clovers, trefoil and alfalfa are the legumes most used in frost seeding. The down side of alfalfa is a built in autotoxicity that allows existing alfalfa plants to kill any new germinating alfalfa seed. If there is existing alfalfa in a field, putting more alfalfa seed into the ground is counter productive.

Red clover and white clover stands can be effectively rejuvenated with frost seeding. In the Kapuskasing trial, the application of 10 lbs per acre provided a dramatic increase in legume content. However, bear in mind that clovers can cause bloat. Managing pastures with thick clover stands can be a challenge.

**References**

<sup>1</sup>Thomas Sebastien, et al. 2011. Can. J. Anim. Sci. Temperament in beef cattle: Methods of measurement and their relationship to production. 91:557-565.

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**Frost Seeding Works**

**Barry Potter**, Agriculture Development Specialist, OMAFRA

The all terrain vehicle (ATV) roared up and down the field, ripping through the last snow drifts of winter. The passing vehicle slowed, the driver obviously wondering if his neighbouring farmer had finally lost his marbles.

But no marbles had been lost. Instead, the spinner on the back of the ATV threw grass seed across the frozen field, to be lost into the slowly thawing soil. This activity would pay off later on, resulting in vigorous new growth in a thickening sward of pasture.

Frost seeding is the name given to the process of spreading seed across fields in late winter and early spring. The thawing/freezing action in early spring acts to work the grass seed into the soil. Moisture from melting snow and spring rains helps the seed germinate. The new seedlings grow to thicken stands, providing more grazing for livestock.

Recently (2009), at the Agriculture Canada Research Station at Kapuskasing, several fields were determined to have low or non-existent legume content. The cows grazed existing grasses in the fall, leaving little residue. Red Clover seed was spread on the fields by ATV in April of 2010, while snow was still on the

An option would be to include 5 lbs of clover and 3 lbs of trefoil. Trefoil does not cause bloat, and provides the same nitrogen fixing capability as clover. However, It can be harder to establish than the clovers.

The experience at Kapuskasing, and research at Wisconsin demonstrates that having the cows graze off the pasture in late fall allows the seed better soil contact and more light to power the newly germinated plants.

Frost seeding can work to rejuvenate old stands. Frost seeding of legumes also adds their nitrogen fixing capabilities to the sod, thus reducing the need to purchase as much commercial nitrogen fertilizer. While frost seeding is not as effective a strategy to rejuvenate a pasture as plowing and working up the land, it is a much cheaper alternative than plowing with conventional seeding. Its also a great the way to improve fields that are too rough or hilly to be worked by conventional tillage.

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## Trace Mineral Supplementation at Pasture: Cattle Performance on Different TM Sources

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In Volume 8, Issue 23 of *Virtual Beef* (July of 2009), I wrote an article citing the cumulative research of the National Research Council (NRC) and my recommendations on the mineral requirements of cattle at pasture. The data and the article suggested that if pasture forages were analyzed to ensure sufficient levels of macro-minerals (eg phosphorus, calcium, potassium, magnesium) pasture producers could use properly formulated trace mineralized (TM) salt to meet the remaining TM requirements, most importantly selenium in Ontario conditions.

Since that time, an Ontario Cattlemen’s Association (OCA) supported project funded through the Farm Innovation Program (FIP – Agricultural Adaptation Council) has looked specifically at the issues of TM supplementation for backgrounding cattle at pasture. This research was undertaken and continues under the direction of Dr. Peter Kotzeff (Chesley Veterinary Clinic) and myself. At present, we have the 2012 animal performance data on pasture analyzed, and have reached some conclusions to be shared with VB readers. The analysis of blood and feedlot close-out data continues, and will be shared at a later date. So, here is an update on what we have done to date.

### 2011 TM Project Objective

To determine the effectiveness of selenium (Se) pellets (Australia), TM resin boluses (United Kingdom, and now available here), and the feeding of trace-mineralized (TM) salt on pasture as the sole Se, mineral and vitamin E sources.

### Procedure (Methods)

In spring of 2011, approximately 700 head were purchased from various sources. The origin of the cattle included Western Canada, the Ottawa Valley and local sales in the Grey/Bruce area. One-third of all these animals were allocated to each; the Se pellets, the TM resin boluses and neither, such that all animals could be grazed as commercial groups. All animals were offered free-choice TM salt for the duration of their stay at pasture. All cattle weights were taken at turn-out and off-grass processing using both their EID/RFID tags and visual tags. Each animal was tracked for morbidity (health) and performance (total gain and ADG) for their duration at pasture. Within the group, about 85 head were blood sampled at turn-out, and again at off-grass processing; 42 will be repeated at feedlot as part of following these animals to market. The blood samples taken were and are to be analyzed for trace minerals (TM), including Se plus vitamin E. As indicated, the blood analysis portion of the project continues and will be reported upon in another edition of VB. This article focuses on animal performance.

### Results

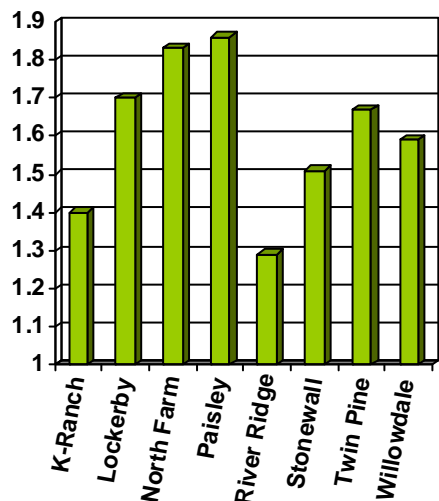
The preliminary and main statistical analysis on gain at pasture is complete, although the analysis of forage quality trends is still to be completed, as is the blood data as mentioned previously. One of the greatest challenges with field trials is the variability in cattle sources and pasture locations, plus staggered start/end dates. This makes the statistical analysis complicated, but very real-life! As expected, we found that cattle quality and pasture performance matter, but despite this some TM source specific effects can be teased out. Adjusted pasture performances are given in Table 1 and Figure 1 to demonstrate. Statistical significances are not included in Table 1 or Figure 1, as this graph is just to demonstrate the reality and challenge of pasture quality across diverse locations, whether that is agronomic, management, precipitation or pure chance.

**Table 1. Animal performance (average daily gain in lbs) by pasture location.**

Pasture Farm	ADG LSMeans <sup>1</sup> (lbs/day)
K-Ranch	1.40
Lockerby	1.70
North Farm	1.83
Paisley	1.86
River Ridge	1.29
Stonewall	1.51
Twin Pine	1.67

<sup>1</sup> Least square means

**Figure 1. Adjusted animal performance (average daily gain in lbs) by pasture location**



What we found for our TM treatments (Table 2, and Figure 2) is:

- the iron-Se pellet does not improve animal performance over free-choice TM salt,
- the TM resin bolus improves gain, especially on one purchase group (interaction). Although this suggests that the benefit from the bolus was disproportional for this group, the improvement is not economical based on the cost of the product.

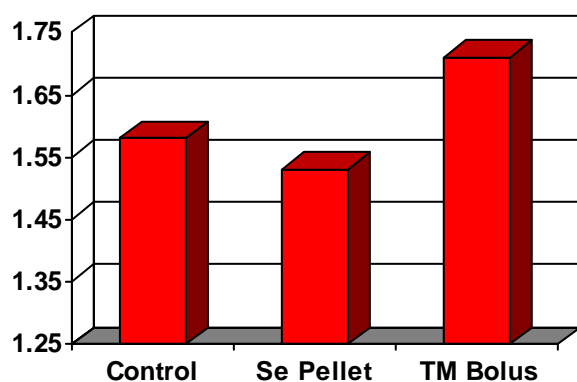
**Table 2. Animal performance (average daily gain in lbs) by TM source, with 'Control' being TM salt only.**

Treatment	ADG LSMeans <sup>1,2</sup>
Control	1.58 <sup>a,b</sup>
Se Pellet	1.53 <sup>a</sup>
TM Bolus	1.71 <sup>b</sup>

<sup>1</sup> Least square means

<sup>2</sup> Means with differing superscripts are statistically different.

**Figure 2. Adjusted animal performance (average daily gain in lbs) by TM source, with 'Control' being TM salt only**



Including the data from preliminary and background blood and gain work done by Dr, Kotzeff in 2010, this means that by default a properly formulated TM salt appears to be an adequate and economical form of supplementation. Again; this is assuming a producer has ensured her/his pasture forages have sufficient macro-mineral levels. It also means that generally, the most critical aspect of backgrounding is the pasture. This includes all agronomics and management as the key factors for cattle gain with one example shown in Figure 3.



**Figure 3.** This photo at pasture sampling in September shows some of the challenges experienced that vary from pasture to pasture location. In this case, it was the obvious impact of low precipitation in late summer allowing a good portion of a coat hanger to be inserted in cracked clay.

### Implications Moving Forward

As mentioned, the remaining blood and pasture parameters for 2011 need to be fully tabulated and reported upon. But, we now have more evidence that simple, economical and properly formulated TM programs can work in theory and practice. If such a program is of interest to a producer, he/she can re-visit the VB article mentioned once earlier which first appeared in July 2009.

Dr. Kotzeff and I are continuing the project in 2012, but are currently trying to assess which very specific direction we need to go, considering what we have found. We would like to thank the OCA and ACC for their continued support, and hope this information is of interest to cattlemen across Ontario.

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### **Interested in attending a farm business management conference?**

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Agriculture and food business owners, individuals involved in agriculture leadership roles, government, research and academic partners are welcome to attend. Use this opportunity to learn more about how to take leadership to the next level, increasing food demand and how the current global markets and economy are providing opportunities to agriculture.

For more information visit: [www.takeanewapproach.ca/events](http://www.takeanewapproach.ca/events)

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