CHAMPION Feed Services Ltd.

Feed Intake in Feedlot Cattle

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Take Home Message

- ✓ Dry matter intake is a measurable window to the soul of cattle performance.
- ✓ Animal performance can be predicted with reasonable accuracy if feed intake is monitored on a daily basis and if historical feed conversions or net energy of current feed ingredients are known.
- ✓ Dry matter intake can also be used to troubleshoot pens of cattle.
- ✓ If dry matter intake (DMI) is unexpectedly low, management changes should be implemented in an attempt to correct the problem.
- ✓ To determine expected feed intake of cattle combine the base dry matter intake shown in **Table 1** with the adjustment factors shown in **Table 2**.
- ✓ If intake of your cattle is significantly below these numbers, then you should implement changes to your nutrition and management regime in an effort to boost dry matter intake.
- ✓ The first step is to monitor DMI if you are not already doing so.

Introduction

Optimizing cattle performance is essential to remain competitive in the cattle feeding game. If you finish cattle, common goals are to maximize average daily gain and optimize feed efficiency. If you are a backgrounder, the main goal is to obtain a predictable amount of gain in an efficient manner to meet contract specifications. Feed intake is a powerful tool used by feedlot personnel and nutritional consultants to predict animal performance, meet contract deadlines and to monitor the ongoing progress of pens of cattle.

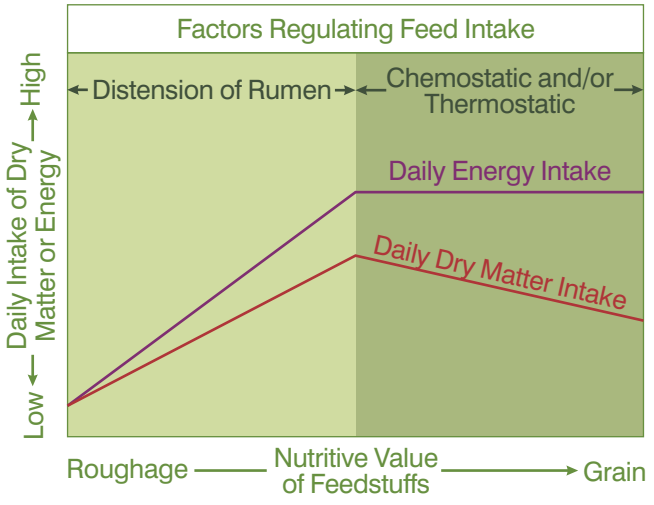
If you feed cattle and know historical feed conversions or if you know the net energy content of current ingredients you can reasonably accurately predict average daily gain if you monitor dry matter intake (DMI) on a daily basis. If your cattle are below expected DMI it serves as a troubleshooting

technique that can be used to get pens of cattle back on track. In general, if cattle are eating well, they should be performing well. If dry matter intake is low, animal performance is usually disappointing. When your nutritionist calls on your feedlot, that individual needs information to help determine how your cattle are performing. Estimates of DMI expressed as a percentage of body weight on a dry matter basis are an excellent tool to monitor ongoing progress of cattle in feedlots. The goal of this fact sheet is to indicate the importance of monitoring DMI and indicate its usefulness as a performance predictor and troubleshooting tool.

Factors Affecting Dry Matter Intake

The generally accepted theory relative to feed intake in ruminants is that cattle on high roughage rations limit their intake by physical means, they simply can not fit any more feed in the rumen. The rumen is full! Physical limitations to feed intake is partially a function of rate of digestion and therefore rate of passage of feed from the gut. If the rate of digestion can be increased, then the rate of passage will most likely increase which in turn allows the feedlot animal to consume more dry matter. If the rate of digestion is slow, feed intake is limited due to a full rumen.

Figure 1. Relationship of the Nutritive Value of Feed and Feed Intake to Factors Limiting Feed Intake. Adapted from (**4**).



Cattle consuming a finishing ration do not stop eating because they can no longer fit any more feed in the rumen. Feed intake of cattle fed a high energy ration is limited by total energy intake. The brain says, "do not consume any more energy!". These relationships are shown in Figure 1. It is important to be familiar with this basic concept so that we can readily understand and help correct problems with low dry matter intake in cattle consuming high roughage and high concentrate rations. For example, if you feed long chopped silage you may run into dry matter intake problems in cattle fed a high roughage diet but it probably will not significantly influence dry matter intake in finishers.

Estimates of Dry Matter Intake and Adjustment Factors

Dry matter intake alone is an ineffective tool, however if DMI is compared to a benchmark then it becomes a very important management tool. **Table 1** shows expected DMI of cattle that are settled in the feedlot. Dry matter intake is influenced by

Table 1. Expected feed intake of cattle in feedlots.	
Weight of cattle and type of ration fed	Expected dry matter intake % of body weight
400 pounds, grower ration	3.0
550 pounds, grower ration	2.8
700 pounds, grower ration	2.6
850 pounds, finisher ration	2.4
1,000 pounds, finisher ration	2.2
1,200 pounds, finished for 120 days	2.0
1,200 pounds, finished for 140 days	1.8
1,200 pounds, finished for 160 days	1.6
Expected dry matter intake of crossbred steer calves fed during the summer in thermoneutral conditions. The steers are carrying medium flesh (condition score 5.5, based on a 1 to 9 system), implanted with an estrogenic implant and fed an ionophore. Based on data obtained from well managed Alberta feedlots.	

many factors, these factors do not act alone, there are an unlimited number of interactions. Key factors that influence DMI are shown in **Table 2**. The adjustment factors shown in **Table 2** are based on the animal described in Table 1.

Low Protein

"With feedlot cattle, most feed intake responses to crude protein supplementation are the result of an increased rate of gain rather than an increased DMI as a percent of body weight"(**1**).

Environmental Conditions

The adjustment factors for environmental conditions shown in **Table 2** are most accurate when applied to cattle exposed to short periods of heat and cold stress. Feed intake data summarized by Koers & Turgeon Consulting Services (**8**) over an 8 year period indicates a seasonal pattern in feed intake with feedyards located from the Texas panhandle to Nebraska, Figure 2. This graph indicates that cattle fed during the months of February and March have the lowest level of feed intake which is difficult to explain based on relatively cold temperatures. This data set challenges conventional thinking that feed intake automatically goes up during exposure to cold temperatures. Most feed intake data for ruminants associated with changes in temperature has been generated in short term research trials. Feed intake of cattle in feedlots sometimes drops during exposure to cold temperatures. The reduction in feed intake may be caused by several factors. The cattle may not rise from their well bedded pack as regularly as compared to warmer conditions, therefore they go to the bunk less frequently. In addition, if a silage based ration is fed in extremely cold conditions, it takes excellent bunk management to keep palatable, unfrozen feed in front of the cattle during cold days. In addition, bison

Figure 2. Seasonal varition in feed intake of feedlot cattle. Source: Koers & Turgeon Consulting Service, unpublished.

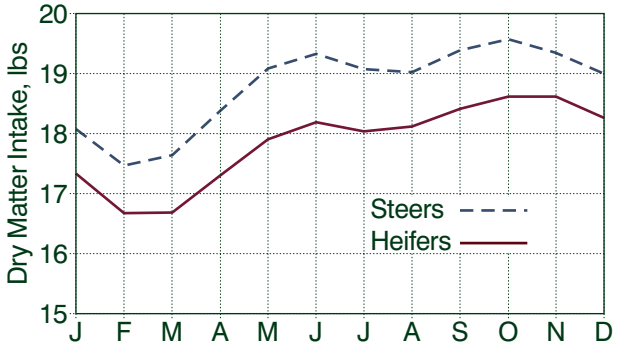


Table 2. Adjustment factors for dry matter intake in feedlot cattle, based on the example steer shown in **Table 1**.

Adjustment factor		Multiplier	References
Empty body fat, %	Condition score		
21.3	5.5	1.0	(**7**)
23.8	6.5	0.97	
26.5	7.0	0.90	
29.0	8.0	0.82	
31.5	8.5	0.73	
No ionophore		1.06	(**7**)
Tylan		1.00	(**10**)
Non-implanted cattle, Estrogenic		0.92	(**9**)
Non-implanted cattle, Trenbolone acetate and estrogenic		0.92	(**3**)
Heifers, no MGA		0.90	(**7**)
Heifers, MGA		0.95	(**10**)
Holsteins		1.08	(**7**)
Holsteins - British Cross		1.04	(**7**)
Calf		1.0	(**7**)
Yearling		1.10	(**7**)
Lactating		1.35 to 1.50	(**7**)
Selection pressure for growth rate		1.12	(**3**)
Environmental conditions		See discussion in text	
>35°C, with no night cooling		0.65	(**6**)
>35°C, with night cooling		0.90	
25-35°C		0.90	
15-25°C		None	
5-15°C		1.03	
-5 to 5°C		1.05	
-15 to -5°C		1.07	
< -15°C		1.16	
Intake during extreme cold, storms or blizzard may be temporarily depressed			
Rain		0.90 to 0.70	(**5**)
Mud, mild, 10-20 cm		0.95 to 0.85	(**5**)
Mud, severe, 30-60 cm		0.85 to 0.70	(**5**)
Long days		1.02	(**7**)
Short days		0.98	(**7**)
Compensatory growth		1.10-1.20	(**11**)
Long chopped forage, background ration		0.80 to 0.95	Personal observation
Long chopped forage, finishing ration		0.95	Personal observation
Low protein		See discussion	(**1**)

reduce their feed intake during winter periods as a strategy for survival. Perhaps the same phenomenon occurs in cattle. In general, feed intake is higher in the summer months than the winter months.

Example

The following numbers which were obtained from Tables **1** and **2** are used to estimate DMI expressed as a percentage of body weight on a dry matter basis of a 700 pound crossbred heifer calf. The heifer has a condition score of 6.5 and is fed during the summer time at 20 C. The heifer is fed a combination of Rumensin® and MGA® and is implanted with a Trenbolone-Estrogenic implant.

Base intake	2.6%
Condition score = 6.5	97%
Ionophore	100%
Implant, Trenbolone-Estrogenic	100%
Heifer-MGA	95%
Temperature = 20°C	100%
Predicted intake	2.4%

Summary

Feed intake is an excellent tool for estimating performance of feedlot cattle. The data shown in Tables **1** and **2** give a basis for comparing dry matter intake of feedlot cattle under various conditions. However, the first step is to monitor DMI if you are not already doing so.

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