

Low Test Weight Corn -- What is the Impact of Feeding it to Cattle?

Dr. Jeannine P. Schwehofer, MSUE Beef Educator

With the cool and wet growing season we saw this past year, many producers harvested low test weight corn and are feeding it out this season. Low test weight corn, corn with less than 54 lb/bu, has less starch and more fiber available than U.S. No. 1 corn (≥ 56 lb/bu) or U.S. No. 2 corn (≥ 54 lb/bu) and is often fed to livestock. Grain buyers typically dock heavily for corn with low test weights and(or) high moisture content. Feeding this corn to cattle appears to be one of the best uses for low test weight corn and allows the producer to maximize the value of their corn.

Low test weight corn is often associated with higher protein, although some samples from South Dakota State University research found the protein to be lower, even as low as 7.5%. If you balance a diet using book values for corn (9.5 to 10.1% crude protein) and your actual value is much lower, this can lead to a deficiency of protein in the ration and decreased animal performance.

Research from North Dakota State University found that low test weight corn (39.1 lb/bu) was higher in protein (11.3% crude protein) but had no affect on dry-matter intake, gain, or net energy for gain. In the same study, they found improved feed to gain ratios in cattle fed low test weight corn. They concluded that feeding low test weight corn to growing steers is comparable to feeding regular corn.

In a two-year research study from Nebraska, low test weight corn was fed in grower and finisher diets. They found average daily gain and feed efficiency to be as



Low test weight corn can be fed successfully to cattle

good with the low test weight corn as the regular test weight corn when included in growing and finishing diets. They also found increased average daily gain in the finishing steers fed low test weight corn in year one of the trial, but not in year two or when using combined data from year one and two. Hot carcass weights increased in cattle fed low test weight corn using combined data from both years. Other carcass data results were similar for cattle fed low test weight corn or regular corn. These authors concluded that feeding low test weight corn of 46 lb/bu or greater resulted in similar results to feeding U.S. No. 2 corn to growing and finishing cattle.

Feeding low test weight corn to cattle can have desirable results. However, it is important to have your feed analyzed so that you know what you are feeding and that the ration is properly balanced. Another important thing to remember, especially with low test weight corn, is to feed by actual weight (lb) and not volume. It takes more volume of low test weight corn to equal a bushel. Feeding by volume could result in not delivering enough feed to the cattle to reach their optimal intake and performance. Contact your local livestock extension educator for more information regarding sampling and analysis of feedstuffs. 

MSU Beef Team Launches New Website

Filled with beef production resources, upcoming events, and information on our programs. Visit us online at: <http://beef.msu.edu>

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Michigan TB Update - Changes in bTB Zone

Phil Durst, MSUE Dairy Educator

Dr. Dan Grooms, MSU, Dept. of Large Animal Clinical Sciences

The bTB zone changes for Michigan, shrinking the MAZ primarily to five counties and advancing six counties in western northern Michigan to MAAZ status was published in the Federal Register on Dec. 18, 2009. Michigan will implement the new zones on Jan. 4, 2010 (Figure 1). Beginning January 2010 the whole herd testing requirements will change, with random or lottery testing in the U.P. and the MAAZ Subzone 3 ceasing. There will be no random testing of herds in these areas. The process of testing all herds in MAAZ Subzone 2 will continue one more year until all herds are tested. In the new MAAZ Subzone 1, six counties that are currently in the MAZ (Counties of Emmet, Cheboygan, Charlevoix, Antrim, Otsego and Crawford), the testing schedule will be as follows:

- Herds selling breeding stock will be tested annually
- Herds selling feeder calves only will be tested every other year
- Feedlots and terminal operations will be tested every third year

Whole herd tests for these herds will include all cattle 18 months and older, with the exception of TB accredited herds for which the regulations will not change. All cattle herds in the MAZ will continue to be whole herd tested annually. Movement permits will be required for animals being shipped out of the MAZ including animals being sent to the Gaylord sale facility, which is in the MAAZ.

Funds available to livestock producers

Natural Resources Conservation Service (NRCS) funds for Michigan are being allocated by regions of the state, rather than to the state as a whole. Be-

cause of this change, producers in northern Michigan will have increased access to federal cost-share funds under the EQIP program. The regions established include Area 2, which extends from the northern tip of the Lower Peninsula to the southern border of Mason, Lake, Osceola, Clare, Gladwin and Arenac counties. For Area 2, \$1.1 million is available. Cost-share options include practices and structures that can be useful to reduce the risk of bTB transmission and may be part of a farm's Wildlife Risk Mitigation (WRM) Action Plan. Producers should contact their NRCS office for more information.

In addition, the Michigan Department of Agriculture (MDA) is making \$300,000 in 2010 available for hoop barn hay storage and feed fencing projects through the Alpena County Conservation District. These funds are limited to MAZ farms as a cost-share program to reduce the potential for disease transmission. Contact the District office at 989-356-3596.

Testing of cattle sold out of the MAZ and MAAZ Subzone 1

Beginning Jan. 4, 2010, breeding cattle that are purchased from farms in the MAZ or the new MAAZ Subzone 1 (Counties of Emmet, Cheboygan, Charlevoix, Antrim, Otsego and Crawford) that DO NOT have a verified Wildlife Risk Mitigation Action Plan will be required to have an individual animal TB test completed within 60 to 120 days following purchase at the expense of the new owner. This applies only to cattle which are sold to herds in MAAZ Subzones 2 or 3 or the TB Free Zone (U.P.).

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Keep it Simple and Profitable -- 4x4 Cow Calf Management

Dr. Ben Bartlett, MSUE Beef Educator

Have you ever heard of the 80 - 20 rule or Pareto Principle, where a small proportion of your actions generates most of the results? This idea may be true of the beef cow business - 20% of our decisions generate 80% of our profits. Wouldn't it be great if we could identify critical areas so we could put most of our effort into the really important things? Unfortunately, we often worry about everything equally, or even worse, we sweat the small stuff. Do we put more effort into getting the best price on blackleg vaccine than we do for finding the best marketing plan for our cull cows? Cull cows may be 15% of our annual income versus an item that may be 0.1% of our costs.

I once had a friend tell me that the 4x4 on the back

of a corn farmer's pickup was because he worked four weeks in the spring and four weeks in the fall. What if we focused on just four important things in the spring and four in the fall and, as a result, did a better job managing our beef cow operations. Yes, the

cows need to eat every day, and we need to check for sickness, etc., but the point is to identify those *critical control points* that make the most difference in the success of our operations.

Here's my spring and fall 4x4 *critical control points* beef cow management plan. Keep in mind that the profitability of our operations is based on the following equation: Income (number of head x lb per head x price), minus costs, equal profit. Our management decisions should focus on those items.

Spring

Have a successful calving season If you are losing over 5% of your calves for any reason, it's worth your time to make changes. Why are they dying? If it's difficult calving, get a different bull. If it's scours, look at your vaccination program, or change your calving system, or maybe even change your calving time.

“What if we focused on just four important things in the spring and four in the fall and, as a result, did a better job managing our beef cow operations.... the point is to identify those critical control points that make the most difference in the success of our operations.”

Grazing and hay plan Generally, about 60 – 70% of the cost of producing a calf is feed cost, and roughly 90% of that cost is forage, hay and pasture. In Michigan, you should be able to graze for at least 8 months and some years longer. Production costs for hay are usually 4 to 5¢/lb whereas pasture is 1 to 2¢/lb. Any time you increase pasture use and cut back on hay, you cut your feed bill in half. Make a grazing plan to avoid a summer slump and extend your grazing season by 30 days. One day spent planning could save a lot of money.

Body condition score cows and replacements

There is a big difference between seeing your cows when you feed them, and actually going out with a clipboard and assigning body condition scores. Score your cows, the 2nd calvers, and the bred heifers 30 to 60 days before calving. The scores will tell you how the winter feeding program performed, what condition your cows are in for calving, and most importantly, if you need to change the ration to improve breeding season success. Cow condition is

critical for strength at calving, quality and quantity of colostrum, and calf survival. This is the most critical time of the year to get your feeding program right and the cow's condition is the best reflection of how well the program is doing.

Genetics Plan Double check your five-year breeding program to see if you are on track. Too often, bulls are purchased to generate next year's calf crop, without the thought that the bull's daughters are taking the herd in the wrong direction. We have too many beef cows weighing over 1800 lb that only wean a 500 lb calf, and we still have too many beef calves born weighing over 100 lb. Everyone should be using EPDs, understand EPDs, and buying only bulls with EPDs that will improve their herd. Also, is your herd sire fertile? About 1 out of 7 bulls in Michigan is sub fertile (causing an extended calving season) or infertile (no calving season). Schedule a breeding soundness exam (BSE).

[Editors note: see insert for MSUE BSE scheduled dates or contact your veterinarian.]

Summer Follow your pasture plan to keep lots of good pasture available, harvest your hay early, and spend some time fishing and on vacation with the kids.

Fall

Marketing Price per pound is important, but more important is the net dollars per head you can put in the bank. Some people fair well at an auction, while others do well selling direct off the farm. The critical point is for you to take gross return minus the shrink, trucking, sales commission, preconditioning costs, and then decide the best way to sell your calves. Don't forget your cull cows as they are between 10 and 20% of your annual sales. Can you afford to "just ship them" during Oct.-Nov. market lows? Consider weaning fat or mature cows for earlier sale and feeding thin or young cows for later sale.

Feed inventory and feeding plan Grab that clipboard and go count your bales. Consider doing a feed analysis on your earliest cut hay and the last field of first cutting to give you an idea of what quality of feed you have to work with. And, do you really know what your bales weigh? If you have this information you'll know something about your hay yields and how much is being offered to the cows. Make a feeding plan so the right groups of animals get the right quality at the right time. If you are a little short of feed, by knowing early, you have the opportunity to keep purchased feed cost to a minimum.

“Every beef operation should decide what their weakest link is and have a written goal, strategy, and tactics plan for the coming year. Keep it handy and make sure your good intentions turn into action.”

Body condition score cows and replacements

Condition scoring is really necessary before you can put your feeding program together. Condition scores can also help identify how your pasture performed, direction of the herd's milking ability, and other issues like internal parasites. Fall pasture may allow you to cheaply increase cow condition. Once the cold winter winds blow, you will be hard pressed to add condition with hay alone. This is also the time to do some sorting, so the thin cows don't become skinny cows by spring.

Plan for a Profit You know your income and you know most of your expenses. Now is the time to analyze the past year and plan for changes in the coming year. Too often we hope things will be different (price will be higher). However, we control the number of head sold, the pounds sold, and the costs (remember hay and pasture are major costs).

What are you going to do differently on those things you control next year to increase your level of profit? Every beef operation should decide what their weakest link is and have a written goal, strategy, and tactics plan for the coming year. Keep it handy and make sure your good intentions turn into action.

Winter: Monitor your winter feeding plan, keep feed waste to a minimum and make sure all cattle have protection from the weather. Enjoy the Holidays with family and watch some football.

Keep your beef cow operation simple and profitable by focusing on the 4x4 critical control points.



New Extension Bulletin from the MSU Beef Team

Incorporating Distillers Grains in Beef Cattle Diets

The publication covers nutrient variation from local Michigan distiller's grain sources, example feedlot and cow diets, and considerations regarding mineral/vitamin supplementation.

Available at <http://beef.msu.edu> go to Nutrition / Distillers Grain

Round Bale Feeder Design Impacts Feeding Losses

Dr. Dan Buskirk, MSU Dept. of Animal Science

For many cow-calf operations, harvested forages, in the form of large round bales, represent the single largest cost in maintaining the cow herd. Although round bales are relatively efficient packages for harvesting, transporting, and storing forages, they can contribute to significant feed waste. Numerous research trials have demonstrated that even with controlled feeding in round bale feeders, feeding waste is routinely measured at between 15 and 25%.

It seems that as an industry, we have become accustomed to accepting this waste as part of the round bale feeding system. We may justify it in our minds as a dry place for young calves to lie down. But wait – if your tractor was leaking 20% of its fuel, if your drill was leaking 20% of its grass seed, or if you lost 1 of 5 bales while hauling them from the field, would you take notice? Sure you would, and you would take quick action.

One of our MSUE educators, Maury Kaercher, made the astute observation that some operations he visited appeared to have a lot of waste around their feeders, while others had relatively little. This prompted us to conduct an experiment with the objective of comparing feeding behavior of cows and waste associated with various designs of round bale feeders. We used 160 beef cows, with 20 cows allotted to each of 8 outside lots. In each of these lots we placed one feeder of four differing designs on a concrete pad: cone (Weldy Enterprises, Wakarusa, IN; model R7C), ring (Weldy Enterprises, model R7), trailer (S.I. Feeders, Portage WI; Arrow Front Feeder Wagon), or cradle (Weldy Enterprises; model 6 × 12 feet HGF)

(Figure 1). Dry, round hay bales were weighed and sampled before feeding. Hay was maintained in the feeders at all times. Each of the four types provided approximately 17 inches of feeder space per cow. Hay that fell onto the concrete surrounding the feeder was considered waste, and was collected in total and sampled daily. At the end of one week, each feeder-type was assigned to a different lot for a second, one week period. During the trial, cow behavior was recorded using time-lapse video. Dry matter hay waste ranged from 3.5 to 14.6% for the different feeders (Table 1).

We observed cows feeding from the cradle feeder had nearly 3 times the agonistic interactions (behavior that displaced another cow from the feeder) and 4 times the frequency of feeder entrances compared to cows feeding from the other feeder types. Feed losses were positively correlated with both agonistic interactions and feeder entrances. These results revealed that design features are likely important in reducing the amount of hay waste associated with feeding in round bale feeders.

From this study, we cannot definitively state which specific design features led to more or less waste. However, through observation of cows eating at these and other feeders, some design features that appear important are:

- *More distance between the outside of the feeder and the feed*
If a 6-foot diameter bale is placed in a 6-foot feeder, the cow necessarily eats on the outside

Table 1. Effect of feeder type on hay waste, intake, and behavior

Item	Feeder Type			
	Cone	Ring	Trailer	Cradle
Hay waste, % ^a	3.5 ^x	6.1 ^x	11.4 ^y	14.6 ^y
Calculated hay intake, as % of cow weight	1.8	1.8	2.0	1.8
Agonistic interactions, #/hour	10.9 ^x	7.4 ^x	13.6 ^x	30.7 ^y
Correct feeder entrances, #/hour	6.1 ^{xy}	3.8 ^x	8.2 ^y	13.0 ^z
Incorrect feeder entrances, #/hour ^b	0.2 ^x	4.2 ^x	0.1 ^x	16.8 ^y

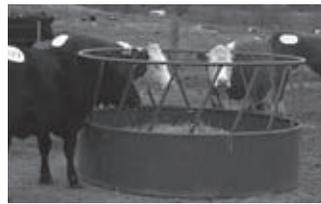
^aHay waste as a percentage of hay disappearance (dry matter basis).

^bEntering the feeder to eat over the top bar

^{x,y,z}Within a row, averages without a common superscript letter differ significantly (P < 0.05).



Figure 1: Cone



Ring



Trailer



Cradle

of the feeder. While this is an extreme case, it is easy to visualize cows wasting more hay while eating the first half of the bale vs. the second half. Cows need to be able to comfortably keep their heads within the feeder perimeter to control waste.

- *Bars or dividers between feeding stations*

Design features that reduce the cow's inclination to push or butt another cow are likely to reduce waste. Often during an agonistic interaction, both cows drop what they are eating to the ground. The greatest waste we observed was with the cradle feeder, which had no divisions between feeding stations. Round feeders may have an advantage in reducing agonistic interactions, as we observed individual cows displacing several cows at a time along the length of a linear design.

- *Feeding height should be comfortable*

Observation revealed that cows often backed out of the trailer feeder to lower their head while eating. Cows prefer to eat while their ears are lower than the top of their shoulders. Cows reaching over the top of the feeder to get hay tend to waste more.

- *Hay saver panel*

Feeders designed to sit on the ground may benefit

from having a solid panel “hay saver” at the bottom to retain more feed inside the feeder.

It is important to note that there are often trade-offs between design features that reduce waste and practical feeding considerations. For example, some of these design features add cost, height, and weight to the hay feeder, which may in turn require a greater investment in equipment and labor to place bales or move feeders.

Profitable cow-calf producers are aware that minimizing new equipment purchases is key in controlling depreciation costs. However, the cost of feeding losses using inferior feeders can be substantial. The value of hay lost in a feeding season of 180 days per feeder for 20 cows is shown in Table 2. One can see from this table that reducing hay waste from say 25% to 10% when hay value is \$90/ton would be expected to save \$771 (\$1,286 - \$515) per feeder each season. Few management changes have the potential to offer this large of a return on investment.

In summary, evaluating your feeding method and appraising new or replacement round bale feeders for the proper design features may be well worth the effort. Relatively subtle differences in these designs may help to save money year after year. 

“Numerous research trials have demonstrated that even with controlled feeding in round bale feeders, feeding waste is routinely measured at between 15 and 25%.”

		Hay value, \$/ton				
		\$70	\$80	\$90	\$100	\$110
Feeding Waste, %	0%	\$0	\$0	\$0	\$0	\$0
	5%	\$200	\$229	\$257	\$286	\$314
	10%	\$400	\$457	\$515	\$572	\$629
	15%	\$600	\$686	\$772	\$858	\$943
	20%	\$800	\$915	\$1,029	\$1,144	\$1,258
	25%	\$1,001	\$1,144	\$1,286	\$1,429	\$1,572

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Beef Producer Opportunities from the MSU Beef Team



January

<i>Date</i>	<i>Time</i>	<i>Topic</i>	<i>Location</i>	<i>Contact</i>
Jan 19	6:00 pm	2010 Great Lakes Professional Cattle Feeding & Marketing Shortcourse	MSU Pavilion, E. Lansing	Steven Rust, 517-432-1390
Jan 20	6:00 pm	2010 Great Lakes Professional Cattle Feeding & Marketing Shortcourse	Wood Co. Fair Grounds, Bowling Green, OH	Stephan Boyles, 614-292-7669
Jan 21	6:00 pm	2010 Great Lakes Professional Cattle Feeding & Marketing Shortcourse	Royal Canadian Legion, Wyoming, ON	Bryan Boyle, 519-845-0809 x408

February

<i>Date</i>	<i>Time</i>	<i>Topic</i>	<i>Location</i>	<i>Contact</i>
Feb 2	6:00 pm	2010 Great Lakes Professional Cattle Feeding & Marketing Shortcourse	MSU Pavilion, E. Lansing	Steven Rust, 517-432-1390
Feb 3	6:00 pm	2010 Great Lakes Professional Cattle Feeding & Marketing Shortcourse	Wood Co. Fair Grounds, Bowling Green, OH	Stephan Boyles, 614-292-7669
Feb 4	6:00 pm	2010 Great Lakes Professional Cattle Feeding & Marketing Shortcourse	Royal Canadian Legion, Wyoming, ON	Bryan Boyle, 519-845-0809 x408
Feb 5	3:00 pm	Seeing Green: Improving Profitability by Maximizing Pasture Productivity & Forage Utilization	Hilliard (County) Bldg, Mason	Dan Hudson, 517-676-7207
Feb 10	7:00 pm	BRD and Feedlot Cattle	Franklin Inn, Bad Axe	Jeannine Schwehofer, 989-269-9949 x612
Feb 11	6:30 pm	Beef Cattle Marketing In 2010	Wheatland Township Hall, Remus	Jerry Lindquist, 231-832-6139
Feb 19	8:45 am	Transferring the Farm to the Next Generation	Richmond Twp Senior Center, Richmond	Jeannine Schwehofer, 989-269-9949 x612
Feb 20	10:00 am	Adding Value to Beef Carcasses	Ebels Meat Processing, Falmouth	Jerry Lindquist, 231-832-6139
Feb 23	6:00 pm	Beef Management Update	Kettunen Center, Tustin	Jerry Lindquist, 231-832-6139
Feb 27-28		4-H Beef, Sheep, & Swine Teen & Adult Leaders Training Workshop	Kettunen Center, Tustin	Local County Extension office

March

<i>Date</i>	<i>Time</i>	<i>Topic</i>	<i>Location</i>	<i>Contact</i>
Mar 2	6:30 pm	Beef 101 (6 sessions for beginning or "wanna be" beef producers)	Glen Oaks Community College, Centreville	Maury Kaercher, 269-467-5511

March (continued)

Mar 4	6:00 pm	Enhancing Your Beef Operation	Shiawassee Fairground, Corunna	Jeannine Schwehofer, 989-269-9949 x612
Mar 9	6:30 pm	Beef 101 (6 sessions for beginning or "wanna be" beef producers)	Glen Oaks Community College, Centreville	Maury Kaercher, 269-467-5511
Mar 10	7:00 pm	Spartan Beef Ration Balancing	Franklin Inn, Bad Axe	Jeannine Schwehofer, 989-269-9949 x612
Mar 12		MI Bull Breeding Soundness Exam Clinic	Andy and Lynn Salinas Farm, Marion	Jerry Lindquist 231-832-6139
Mar 13		MI Bull Breeding Soundness Exam Clinic	Gary Voogt Farm, Marne	Kevin Gould, 616-527-5357
Mar 16	6:30 pm	Beef 101 (6 sessions for beginning or "wanna be" beef producers)	Glen Oaks Community College, Centreville	Maury Kaercher, 269-467-5511
Mar 20	12:30 pm	MCA/MSU Performance Bull Test Sale	Bull Test Station, Crystal, MI	Dan Buskirk, 517-432-0400
Mar 23	10:00 am	Going GREEN with Grazing (during Farm Show)	Gladwin Community Arena, Gladwin	Kable Thurlow, 989-426-7741
Mar 23	6:30 pm	Beef 101 (6 sessions for beginning or "wanna be" beef producers)	Glen Oaks Community College, Centreville	Maury Kaercher, 269-467-5511
Mar 23-24	9:00 am	Cattlemen's College - A.I. School	UPI, Manchester	Maury Kaercher, 269-467-5511
Mar 25	6:00 pm	Spartan Beef Ration Balancing	Shiawassee Fairground, Corunna	Jeannine Schwehofer, 989-269-9949 x612
Mar 30	6:30 pm	Beef 101 (6 sessions for beginning or "wanna be" beef producers)	Glen Oaks Community College, Centreville	Maury Kaercher, 269-467-5511

April

<i>Date</i>	<i>Time</i>	<i>Topic</i>	<i>Location</i>	<i>Contact</i>
Apr 6	6:30 pm	Beef 101 (6 sessions for beginning or "wanna be" beef producers)	Glen Oaks Community College, Centreville	Maury Kaercher, 269-467-5511
Apr 9-11		Michigan Beef Expo	MSU Pavilion, E. Lansing	
Apr 10		MI Bull Breeding Soundness Exam Clinic	MSU College of Veterinary Medicine, E. Lansing	Dan Grooms, 517-432-1494
Apr 12-16		MI Bull Breeding Soundness Exam Clinic	Call for location nearest you	Ben Bartlett, 906-439-5880
Apr 14	7:00 pm	Thumb Cattlemen's Meeting	Franklin Inn, Bad Axe	Jeannine Schwehofer, 989-269-9949 x612
Apr 18		MSU Block & Bridle Club Livestock Judging Contest	MSU Pavilion, E. Lansing	
Apr 30		MI Bull Breeding Soundness Exam Clinic	MSU Lake City Experiment Station, Lake City	Jerry Lindquist, 231-832-6139

May

<i>Date</i>	<i>Time</i>	<i>Topic</i>	<i>Location</i>	<i>Contact</i>
May 1		MI Bull Breeding Soundness Exam Clinic	Chuck Preston Farm, Prescott	Fred Hinkley, 989-345-0692
May 7		MI Bull Breeding Soundness Exam Clinic	Derry Breault Farm, Gladwin	Kable Thurlow, 989-426-7741