

Beef Cow Body Condition Management

Recognizing and managing the fall body condition of beef cows can add value to any operation. Winter feed costs can vary significantly depending on the body condition of the cows in the fall. Cows that are fatter in the fall will cost less to feed over winter than thin cows.

When the winter feed costs for thin cows are compared to those for fat cows, the significance of body condition becomes clear. One body condition score on a cow going into the winter season can mean an extra cost or a saving of \$35-60/cow, depending on feed costs and cow size.

Background

One of the best management decisions a beef producer can make is to target beef cows that are in good body condition at the beginning of the winter feeding period. This management decision makes money all the time, but is especially profitable during drought years when feed is scarce and high-priced such that alternate feeding programs become necessary.

The research

From 1997 to 2000, Alberta Agriculture, the University of Alberta and industry conducted a winter-feeding trial to look at the effect of fall body condition on winter feed requirements of beef cows.

In 1997/98, 196 pregnant beef cows were fed daily in pens of 4. In 1998/99, 50 pregnant beef cows were housed in individual pens and fed every second day. And in 1999/00, 60 pregnant beef cows were housed in individual pens and were fed every second day.

In the fall of each year, the cows were weighed, body condition scored (BCS) on the 5 point Canadian scale and then given ultra sound to assess backfat. The cows were then selected to receive one of three regimens:

- “thin” cows that had a BCS average of 2.25 over the three years were fed to gain condition
- “moderate” cows that had a BCS average of 3 over the three years were fed to maintain condition
- “fat” cows that had an average BCS of 3.6 over the three years were fed to lose condition

The feeding programs were set up to target a BCS at calving of 3 out of 5, which previous research established as the most productive BCS for a mature cow at calving. The trial lasted between 110 and 120 days each year, with the cows returning home for the April calving season. All cows were owned by numerous Alberta cow/calf producers.

Results

Table 1. shows the three-year averages for each grouping of cows while Table 2. provides the ration summaries.

Table 1. Physical Summary (3-year averages)			
	Thin	Moderate	Fat
Start BCS	2.30	3.01	3.64
End BCS	3.00	3.13	3.38
Change	+0.70	+0.12	-0.26
Start weight	1196	1289	1379
End weight	1363	1403	1455
Change (ADG)	+167 (1.46)	+114 (1.00)	+76 (0.68)
Start backfat (mm)	2.37	4.00	7.13
End backfat (mm)	6.13	4.90	7.00
Change	+3.76	+0.90	-0.13

	Year 1*		Year 2*			Year 3*	
	Straw	Silage	Straw	Silage	Barley	Silage	Barley
Thin	7.88	16.94	4.10	18.60	3.83	17.37	10.83
Moderate	7.74	16.06	7.78	17.87	1.77	19.80	
Fat	6.83	13.94	8.30	15.07	0.21	18.40	

*Year 1 – Barley silage and barley straw fed daily, Year 2 – Alf/grass silage, barley straw and barley grain fed every second day, Year 3 – barley silage, barley straw and barley grain fed every second day

Conclusions

The economic affects of this trial are shown in Table 3. The feed costs have been calculated on a per-cow per-day basis and on a per-1000 lbs of cow per-day. This second calculation removes the variable of cow weight at the start of the trial, leaving body condition score as the only variable.

The costs are shown using two sets of feed prices. The 1997 to 2000 feed cost is calculated using the actual average feed prices during the trial and may better reflect the economics of body condition management during an “average” year. The 2002 feed cost is calculated using average feed prices at the start of the 2002/03 feeding season, and these costs reflect the economics during a drought year.

	\$/cow/day		\$/1000 lbs of cow/day	
	1997-2000	2002	1997-2000	2002
Thin (2.3)	1.15	2.06	0.96	1.72
Moderate (3)	0.88	1.70	0.68	1.32
Fat (3.6)	0.75	1.47	0.55	1.07
Cost to feed thin over fat	\$0.40	\$0.59	\$0.41	\$0.65

*1997-2000 feed prices – silage - \$32/tonne as fed, straw - \$32/tonne as fed, barley - \$3.00/bus as fed
2002 feed prices – silage - \$60/tonne as fed, straw - \$77/tonne as fed, barley - \$4.00/bus as fed

Industry often asks for a dollar value for body condition. Using the 2002 difference between the thin and fat cows in feed cost per 1000 lbs of cow per day of \$0.65, the body condition score difference of 1.3 at the start of the trial, and the time frame of 115 days in the calculations, the value of one body condition score for the 2002/03 feeding season is \$58. Using the 1997-2000 data, one BCS is worth \$36. This \$36 could be considered as a baseline for future years when weather and feed prices are not as extreme.

This data also has implications for the amount of feed needed. Over the three years, the thin cows required 26.5 lbs dry matter (DM) per day, whereas the fat cows only required 21 lbs DM per day, a difference of 5.5 lbs DM. Looking at Year 3 data only, where the difference in DM consumption was almost 10 lbs per cow per day, the fall body condition can have very significant effect on feed and roughage needs.

Management

The above calculation suggests that one condition score can be valued at \$58. This conclusion applies to 1000 pounds of cow and only for the duration of the trial, the first 115 days of the winter feeding season. The potential effect may be greater if the data were applied to the entire winter feeding season and on larger cows.

The bottom line is that management of the fall body condition of beef cows has economic value and can reduce roughage needs. Producers with 150 cows could see returns from body condition management totaling over \$25,000.

Management programs that increase fall body condition in beef cows include pasture management, early weaning and creep feeding. Management programs that could benefit from body condition score determination and utilization include feed system management, ration management and cow selection.

The economic return could come from a management program as simple as sorting the thinner cows from the fatter cows and setting up two winter feeding programs. This way, the cows receive the appropriate ration, rather than simply using one ration for all based on the law of averages.

Ellerslie Index

A management tool that resulted from this trial is an index formula that assists in cow selection. The premise for the formula is that evaluating cows on calf weaning weight percentage and cow fall body condition, and then selecting for the higher indexing cows would result in a more efficient herd.

The process involves collecting individual cow weights and body condition scores in the fall, as well as individual calf weaning weights as a percentage of their dams’ mature weight. The averages of these three numbers would then be calculated. Each cow could then be indexed, using the Ellerslie Index below, to determine her productive efficiency.

The definition of this index suggests that the most efficient cow would be higher than herd average in her calf's weaning weight percentage and would have above average body condition score in the fall.

Ellerslie Index $100 + (\% \text{ of weight weaned} - \text{herd avg}) \times 2 + (\text{BCS} - \text{herd avg}) \times 6$

The factors of 2 and 6 in the above formula are specific to the data collected from 1997 to 2000. During this period, the body condition score portion of the calculation was three times greater than the weaning weight portion, due to the calf and feed prices during that time.

With the calf and feed prices in the fall of 2002, the factors would actually be 2 and 7, suggesting a greater emphasis on the BCS portion because of higher feed prices in relation to calf prices. During a year of higher calf prices and lower feed costs, the factors may be 2 and 5. Producers are encouraged to ensure their factors reflect the most current conditions.

Examples

$$\text{Cow 1} - 100 + (48\% - 46\%) \times 2 + (3 - 2.5) \times 6 = 107$$

$$\text{Cow 2} - 100 + (44\% - 46\%) \times 2 + (2.25 - 2.5) \times 6 = 94.5$$

$$\text{Cow 3} - 100 + (49\% - 46\%) \times 2 + (2.5 - 2.5) \times 6 = 106$$

$$\text{Cow 4} - 100 + (46\% - 46\%) \times 2 + (3.5 - 2.5) \times 6 = 106$$

In the above examples, the herd average weaning percentage is 46 per cent, and the herd average BCS is 2.5. A producer may choose to cull Cow 2 because of her poorer index. The producer may decide that two or three years of data may be necessary before a cow is culled due to a poor index.

Over time, as poor indexing cows are culled, the overall efficiency and profitability of the herd should increase.

Ellerslie Team

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