

# ENERGY LEVELS FOR WINTERING BEEF COWS

V. L. ANDERSON  
Assistant Animal Husbandman  
Carrington Irrigation Branch Station

## Introduction

Energy requirements for beef cows in areas of severe winters are not well defined. The National Research Council (NRC) publication **Nutrient Requirements for Beef Cattle** (Fifth revised edition, 1976) recommends nutritional requirements for cattle based on age, stage of production, genetic type and desired gain. Cattlemen are encouraged to adjust requirements based on local environmental conditions.

Some research conducted to evaluate how much more energy is required for cold weather concluded that a considerable amount of supplementation is necessary. Jordon, Lister and Rowland (1968) and Hironka and Peters (1969) suggest increasing the energy level 30% to 70% during severe weather in Canada. Berg and Young (1973) recommend increasing energy for Canadian cows from NRC values of 13.1 Mcal to 13.6 Mcal for 1,000-lb. cows and from 15.5 to 17.1 Mcal for 1,250 lb. cows. Anderson and Dinkel (1980) found cows in South Dakota also have higher energy requirements than NRC recommendations. Smaller cows require a larger increase in energy than larger cows. Cows in mid-gestation weighing 1,000 lb. require 2.5 lb. more total digestible nutrients (TDN) than recommended by NRC while cows weighing 1,250 lb. require 2.0 lb. more TDN. During late gestation, cows weighing 1,000 lb. need 1.4 lb. TDN more than NRC suggests while 1,250-lb. cows need only .1 lb. more TDN. Bellows and Short (1978) report higher birth weight but no effect on incidence of difficult births for first calf heifers offered 6.7 lb. more TDN than recommended in a Montana study. Heifers on the high energy ration also had a shorter post partum interval.

Other research has been conducted to determine if cows can be wintered on less than NRC recommended energy levels. Lansford, Douglas and Buchanan (1958) report cows in western North Dakota can be successfully wintered on 75% of suggested energy levels provided adequate gains are achieved during summer grazing. The six-year study however concluded that average birth weights were reduced by 4 lb. and weaning weights reduced by 30 lb. for cows on the low energy ration. Meiske and Goodrich (1970) report cows fed 70% of NRC levels in Minnesota weaned lighter calves than

cows fed 85% and 100% of NRC recommendations. To further evaluate energy supplementation for wintering beef cows in North Dakota, a three-year trial was conducted at the Carrington Irrigation Branch Station.

## Materials and Methods

Mature straightbred Hereford cows were allotted by weight and summer management to one of three treatment groups. Treatment 1 (control) cows were fed according to NCR recommendations. Cows in treatment 2 were fed 120% of NCR recommended levels. Treatment 3 cows were fed the same as the control cows plus 2 lb. of TDN per head per day for every 5 degrees F below 0 degrees F. Cows were reallocated to treatment groups each year. Summer management groups were on irrigated pasture and drylot confinement (Dunn and Olson, 1978). Rations fed during the winter provided more than adequate protein. TM salt and mineral were offered free choice. Irrigated corn silage, chopped alfalfa hay and crop residues were used in balancing the rations. Wheat straw, wheat chaff or bean straw were chopped and mixed with corn silage and hay and bunk fed once daily. During mid-gestation, approximately half of the ration dry matter was made up of crop residues. During the last third of gestation, energy levels in all treatments were increased. During the winter, cows were maintained in small pens with approximately 300 sq. ft. per cow. Slotted windbreak fences provided protection and cows were bedded prior to calving. The trial extended from late fall until calving. After weaning and prior to the start of the trial each year, all cows grazed crop residue for six weeks.

## Results and Discussion

Supplemental energy during the winter did not improve performance of beef cows. Cows fed more gained more weight (Table 1). Although trends appear for increased birth weight and increased calving difficulty with increased energy intake, differences were not significant. Note that cows in this study were reallocated each year. Results must be interpreted as effects of feeding different energy levels for one year. Additional research needs to be done on long term effects of various energy levels.

**Table 1. ENERGY SUPPLEMENTATION FOR WINTERING BEEF COWS**

	Energy Level		
	Control NRC	120% NRC	Floating <sup>1,2</sup>
No. Head	80	79	51
Days on Trial	88	88	86
Dry Matter Intake (lb/hd/day)	16.8	19.2	19.3
TDN Intake (lb/hd/day)	9.5	10.9	10.9
Weight Change (lb.)	-8.0	34.4	23.7
Birth Weight (lb.)	80	82	83
No. Difficult Births <sup>3</sup>	3	4	5
Conception Rate (%)	85	81	90
Adj. 205 Day Weaning Weight (lb)	458	468	454

1. Same as control ration plus 2 Lbs. TDN for every 5 degrees below 0 degrees F.
2. Data available only for winters of 1977-78 and 1978-79.
3. Birth considered difficult if any assistance was needed.

Condition of the beef cows in this experiment was not quantified prior to the start of the trial each fall. However, cows fed according to NRC were generally maintained in good condition, so body reserves may have been adequate to overcome any stress from prolonged or extreme cold. Cows on increased rations were probably receiving more than adequate energy levels in their daily feed. Jordon *et al.* (1968) note that the lack of energy will initially draw down the cow without severe effects on the fetus. Cows in poor body condition at the start of the winter that do not receive supplemental energy may have reduced lactation potential and longer post partum interval.

Cow age is also a factor, as mature cows require less feed during adverse conditions than 2 and 3-year-old cows (Davis *et al.*, 1977). Body condition of the cow in the fall appears to be a major factor in winter feeding levels (Wiltbank *et al.*, 1962). Most research does not quantify this variable, so the producer must make a judgement based on experience and/or advice. It is a fact that in cold weather more energy is expended for maintenance. This energy must come from either body stores or feed. In years of short feed supply, cattlemen may be able to get by feeding recommended levels or less depending on the severity of the winter and cow condition. It is still a general recommendation that beef

cows in North Dakota need more energy than cows in a moderate climate if all other variables are equal.

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#### Summary

There are numerous career opportunities in agricultural businesses and industries in North Dakota. The estimates indicate that employment has grown

modestly in the agricultural implement, grain handling and horticultural businesses. Specific training and/or experience is needed or expected for many of these occupations. Further data regarding results of this study is available from the Department of Agricultural Education at North Dakota State University.