

BROOD COW EFFICIENCY STUDY

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This long term brood cow efficiency study is designed to evaluate diverse crossbred cow types. The primary objective is to identify the brood cow type that will yield the highest return on investment.

Breed combinations used represent a cross section of the diversity that exists among cattle breeds found in North America. The breeds used in this study are all found on farms and ranches in southwestern North Dakota. Breeds selected were categorized according to their expected mature body weight and lactation potential. The Herford breed serves as the foundation and control breed in the investigation. The breed of cow, breed of sire and resulting breed of calf is shown in the following table:

Breed of Cow	X	Breed of Sire	=	Breed of Calf
Hereford (Control)		Hereford		Hereford
Hereford		Charolais		Char. X Heref.
Angus X Hereford		Charolais		Char. X Angus X Heref.
M. Shorthorn X Angus X Hereford		Charolais		Char. X M. Shorthorn X Angus X Heref.
Simmental X Hereford		Charolais		Char. X Sim. X Heref.

Several measurements are required to accomplish the stated objective. The evaluation contains two distinct phases: a drylot wintering phase and a summer grazing phase. During the wintering phase each cow's gestation and lactation feed intake is monitored since body condition and plane of nutrition during the wintering period has a significant impact on rebreeding performance. TDN levels that will promote optimum rebreeding efficiency are utilized. Body weight gain or loss is measured biweekly and used as a barometer to determine the need for adjustments in TDN levels in the last trimester of pregnancy and during the subsequent lactation period following calving but before turnout on pasture.

During the grazing season, stocking rates, estimated milk production, pregnancy rates and pounds of beef produced per acre are recorded for each breed. Pastures are representative of the mixed grass prairie consisting of three major range sites: sandy, shallow and silty. Dominant grass species are blue grama (Bouteloua gracilis), thread leaved sedge (Carex filifolia), western wheatgrass (Agropyron smithii), and needle and thread (Stipa comata). Range sites were selected for similar vegetation, soil, slope and position of slope. Data collected from these sites includes herbage production sampled by clipping the vegetation to ground level inside a 0.25 meter square frame both inside and outside enclosure cages. Herbage is separated into grass, forb and shrub components and oven dried at 80°C prior to weighing. Herbage production for each component and total production for each range site was determined. Clipping for forage production measurements was done on June 23, 1986; before the cows and calves were put on the pastures; July 11, 1986; and after they were removed on October 23, 1986.

Milk production was estimated using the weigh-suckle-weight method at selected dates during the grazing season. Dates selected for milking ability evaluation correspond to varying degrees of pasture maturity. Sampling dates selected were May 15, July 15, September 15 and November 1 of each year.

Pregnancy rates were determined by rectal palpation 45 days after the conclusion of a sixty day breeding season.

Summary:

Only one cycle of this investigation has been completed to date. Raw data summaries of the different measurements are shown in Tables 1, 2, 3, 4, and 5.

Wintering costs are an important element in managing the cow/calf enterprise. The combined wintering cost ranged from \$135.49 for Hereford cows and \$154.00 for the Simmental cross cows. The Angus X Hereford cows and Milking Shorthorn cows were intermediary costing \$141.65 and \$148.60 respectively.

Weaning weight averaged 495, 540, 546, 580 pounds for the Hereford, Angus X Hereford, Simmental X Hereford and Milking Shorthorn X Angus X Hereford, respectively. To determine return on investment in a cow/calf enterprise, the cost of wintering to weaning weight has been combined, and the wintering cost value per pound of calf weaned has been calculated. The wintering cost per pound of calf weaned was \$0.282, \$0.275, \$0.274, and \$0.248 for the Simmental X Hereford, Angus X Hereford, Hereford and Milking Shorthorn X Angus X Hereford, respectively.

There is no element in the cow/calf enterprise that is more important than reproductive success. All of the cow types were exposed to fertile Charolais or Hereford bulls from June 2 to July 31. The crossbred cows grazed a common crested wheatgrass pasture before being placed on the experimental native range pastures. Cows were palpated for pregnancy in early October and were all found pregnant with the exception of the Milking Shorthorn and straightbred Hereford cows. The Milking Shorthorn cross cows had the most difficulty rebreeding.

Estimating milking ability resulted in the Milking Shorthorn cross and Simmental cross cows having the highest average season long milk production of 13.9 and 14 pounds respectively. Average estimated milk production for the Angus X Hereford cross was 11.4 pounds. Hereford cows nursing crossbred calves produced an estimated 10.6 pounds of milk while the Hereford control group produced 10.0 pounds of milk daily. It is interesting to note that while the Simmental and Shorthorn cross cows had the same season long milking estimate there was considerable difference between the two during the season. The Simmental cows had more fluctuation during the grazing season and the Milking Shorthorn cows had less fluctuation and greater persistence in their lactation profile.

Due to above average precipitation during the growing season all of the native range pastures were under stocked. Grass on silty range sites was highly utilized by all breeds as shown in Table 5, which summarizes the percentage of herbage disappearance for each breed.