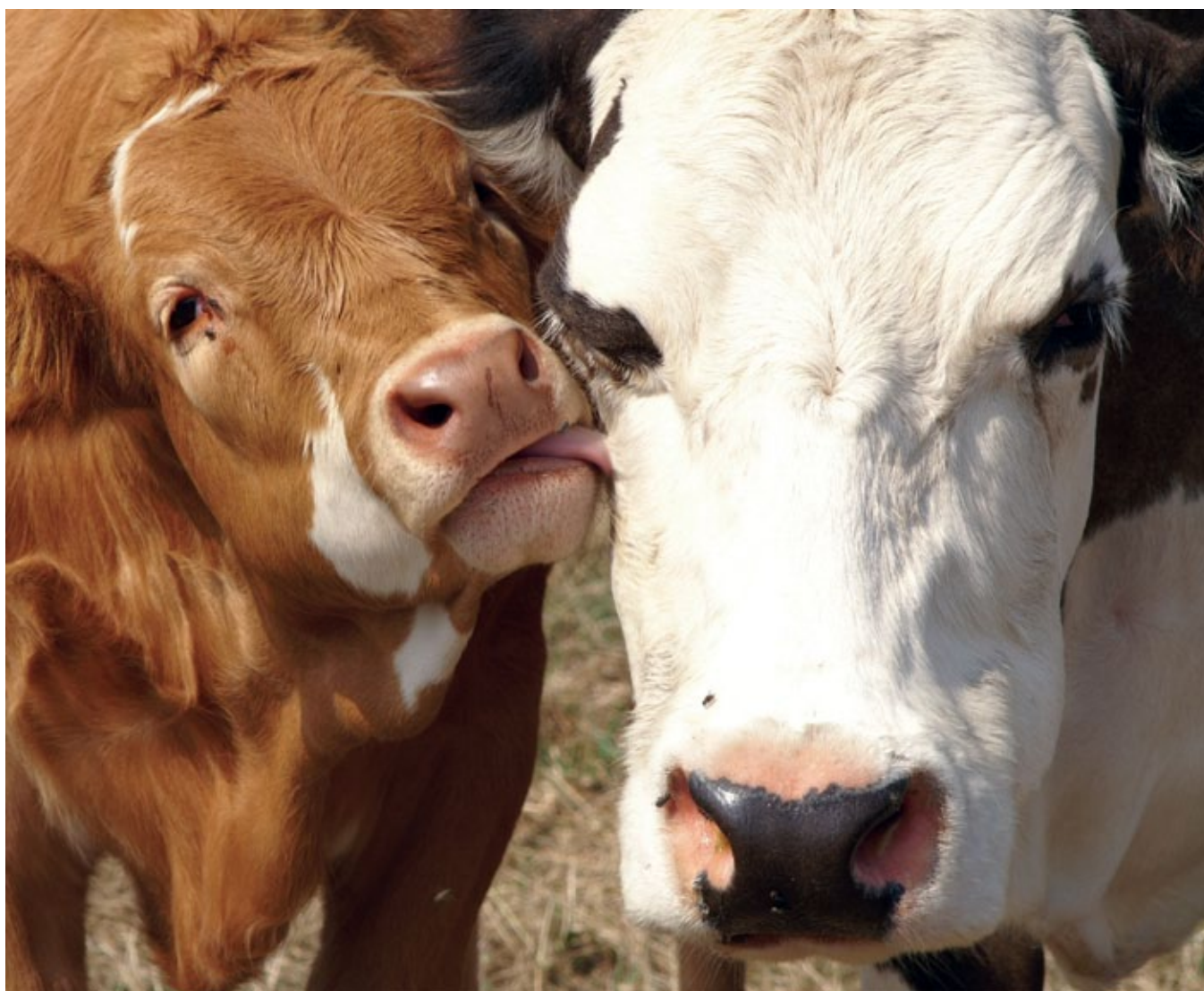


Enterprise Budget for Beef Cattle: Cow-Calf Production

200 Head, Southeastern Wyoming
November 2010



Kendall L. Eisele – John P. Ritten – Christopher T. Bastian – Steven I. Paisley

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Introduction

This bulletin describes a “typical” cow-calf operation in southeastern Wyoming. Production practices are based on what would be considered a well-managed operation in the region. Actual values for any operation will vary based on resource base and management practices. A sample of ranchers from the selected study region attended an extension education field day at the James C. Hageman Sustainable Agriculture Research and Extension Center (SAREC) and participated in a focus group interview. Participating ranchers provided feedback on our sample enterprise budget using “real practices and experience” (see Enterprise Budget - Table 3). Their recommendations were used to develop the budget presented here. The budget is meant to provide an estimate of potential costs and returns and should not be considered an endorsement or exclusion of production practices by the focus group participants or the University of Wyoming.

Few research studies have been conducted regarding cattle ranches in southeast Wyoming. While most information presented is based on local data, this was supplemented with state and regional information on cattle production where necessary. The budget format and design is based on published data from Utah State University (USU) for Toole County cow-calf operations in 2007 (Feuz et al., 2007). Many other budgets were reviewed in the mid-western and western regions of the U.S. including Nebraska, Iowa, Montana, Colorado, North Dakota, Kansas, Missouri, and previous western Wyoming livestock and bison enterprise budgets to develop the appropriate list of potential cost categories as well as overall budget format (Strauch, 2008; Foulke et al., 2001). The USU budget spreadsheet was adapted using information from our review as well as important characteristics specific to a southeastern Wyoming operation given the Wyoming data and input from the focus group interview.

Annual Operations

While operations will vary according to season and structure, the operation calendar designates ranching operations assumed to take place annually (budget designed to look at one year of operation). Table 1 shows the typical timing of operations for a spring calving operation in this area.

Table 1. Operations Calendar for Cow-Calf Ranch in Southeastern Wyoming

Operation	Timing
Calving	March 20-May 20
Breeding	June 15-August 15
Weaning/preg check	October 15-November 15
Yearlings (short; long)	Short-May; Long-September
Sell cull cattle	April/May; November after preg check
Summer pasture	May 1-October 15 (5.5 Months)
Fall/winter pasture	October 16-December 31
Feeding	January 1-April 30
Marketing – Distance to auction 100+ miles	Fall

Herd Assumptions

This budget represents a cattle producer in Platte or Goshen counties in southeastern Wyoming. The cattle herd consists of 200 cows (see Table 2). All cows will be bred, with 30 cows to a bull (i.e., approximately seven bulls for the given herd size). Average farm (ranch) size for Platte and Goshen counties is 2,183 acres, which is smaller than the state average of 2,726 acres (USDA-NASS, 2007).

Table 2. Operational Assumptions for Cow-Calf Ranch in Southeastern Wyoming

Herd characteristics	
Number of cows	200
Percent of cows weaning calves	90%
Percent death loss of cows	2%
Cost of replacement stock (heifers and bulls) @market value	
Cull cow rate	15%
Bull replacement rate	20%
Feed costs are at market value	
All calves sold. Some may be sold to another enterprise.	
Cows per bull	30
Bulls	7
Feed and supplement sources	Number of Months
BLM/USFS	3
State land	1.2
Private lease	2.5
Feed hay	3
Deeded land	5.3
Salt/mineral	150 days
Supplement tubs	90 days
Land size and feed assumptions	
Avg. size of farm operation-owned land	2,183 acres
BLM/USFS land	880 acres
Hay/meadow	393 acres
State land	880 acres
Feed per cow (lbs/unit in one year)	1.25 ton
Grazing per cow (AUMs/unit in one year)	9.2 AUMs
Capital equipment	
Buildings/improvements	3
Trucks	1
Tractors	1
Livestock trailers	1
4-wheel ATV	1

Feed (Pasture, Hay, and Supplement)

The market value of all feed costs (both produced and purchased) is based on price data collected and reported by USDA Agricultural Marketing Service (USDA-AMS) and the Livestock Marketing Information Center (LMIC) from 1992 to 2009. Reported prices in the enterprise budget are 2009 average prices adjusted for inflation to 2010 dollars. This analysis used WASS and USDA-AMS rented pasture rates on an Animal Unit Month (AUM) per cow-calf pair and hay purchase prices as an opportunity cost for cattle production. An AUM provides the approximate amount of forage for a 1,000-pound cow and her calf for one month (Pratt & Rasmussen, 2004).

Cattle are fed alfalfa and native grass hay only when limited by available grazeable forage. Prices for hay in the enterprise budget are 2009 "Statistics by State" prices (USDA-NASS, 2009) and adjusted to 2010 dollars. Supplemental feeding occurs from January to the end of April as shown in Table 1. Supplemental feed for an entire year consists of 1.25 tons of hay fed per cow-calf pair during the three months with the remaining nine months of the year on grass. Grazing supplies an average of 9.2 AUMs per cow-calf pair per year.

Mineral and salt are provided to the cattle for 150 days within the year. Protein supplement tubs are also used at least one to two times a year. Some ranchers in the region use the protein tubs in the fall instead of feeding protein cubes while cows are on dormant range. Other ranchers use the tubs in the spring prior to and during breeding season to improve conception rates (Paisley, 2010). Based on typical usage rates for feed tubs, the tubs are consumed 90 days out of the year. A 225-pound tub costs \$93 (Z&W Mill, 2010). Annual tub costs are estimated as: $90 \text{ days} \times 1.0 \text{ lb/day} \times \$0.41/\text{lb} = \$37/\text{year}$ (Paisley, 2010).

Table 2 illustrates the number of months grazed for private deeded, private lease, state land, and federal land under the Bureau of Land Management (BLM) and U.S. Forest Service (USFS) allotments as well as the breakdown of acres and/or AUMs for each grazing area. All values are based on estimates from Nagler et al. (2006) and WASS (2007 and 2009).

The current USFS/BLM federal grazing rate is \$1.35 per AUM. However, to equal the total cost of grazing reported by Torell et al. (2003), an additional \$0.17 cost of water and a \$2.36 cost of improvements/maintenance was included. The public lands grazing fee is based on the current grazing land lease rates, beef cattle prices, and the cost of livestock production (USFS/BLM, 2010). The reported grazing costs include both a grazing fee (\$3.88) and non-grazing fee costs. Non-grazing fee costs account for other costs on public lands including herding, moving, transportation, improvement maintenance, association fees, miscellaneous labor and mileage, salt/feed, water, and monitoring rangeland conditions (Grazing Fee Task Group, 1995, and Ritten et al., 2010). In private pastureland, WASS reported an AUM grazing figure for a cow and her calf to be \$16 (2009) and inflating these grazing costs to 2010 dollars results in \$16.86. The itemized costs in all three grazing sources of federal, state, and private are:

- Federal (BLM/USFS) and state land
 - \$17.99/AUM = \$3.88 grazing fee costs + \$14.11 non-grazing costs (Ritten et al., 2010)
- Private non-irrigated pastureland lease
 - \$16.86/AUM

Buildings and capital equipment

Buildings and capital equipment are listed in Table 2. These consist of items used by the operation that do not vary with the number of cows, representing fixed costs to the operation. These affect general overhead costs such as depreciation, interest, and maintenance/repairs. Most of the machinery complement is based on input from the focus group interview and Gray (2008): a $\frac{3}{4}$ ton pickup, a gooseneck trailer for hauling, a stock trailer, one 80-horsepower (hp) tractor with a loader, barn, corral, fences, squeeze chute, and 4-wheel ATV. Capital equipment costs are developed based on methods reported in Gray (2008), the Commodity Costs and Returns Estimation Handbook (American Agricultural Economics Association (2000), Wyoming Beef Cattle Producer Survey (Nagler et al., 2006), and student research theses (Strauch, 2008; Small, 2009).

Marketing

Spring calving is typical for southeastern Wyoming livestock operations. Nagler et al. (2006) indicated that 90 percent of survey respondents with cow-calf operations in Wyoming listed spring as the time of calving. Additional assumptions include a 90-percent weaned calf crop, 2-percent death loss for cows, and a culling rate of 15 percent for cows based on input from the producer focus group at SAREC. Cull cows, bulls, calves, and yearlings not used as replacements are assumed to be sold in an auction or to another enterprise (all sold and/or retained at market value).

Returns

Returns on cattle and feeder calves are based on the LMIC monthly average market price data reported from 1992-2009 for Wyoming markets by the USDA-AMS (LMIC, 2010). Sale values are shown in Table 3 and represent the average prices received for calves, cull cows, and cull bulls over this 17-year period. These values are then adjusted for inflation to reflect 2010 prices using the Producer Price Index (Federal Reserve Economic Data, 2010).

Reproduction Costs

The costs associated with reproduction includes a 20-percent bull replacement rate as determined by the focus group. According to Greiner and Miller (2009), a maximum of 40 percent of the total cost of a bull is represented by the purchase price. Therefore, the total cost of the bull is 2.5 times the purchase price at market values as reported from LMIC (2010). Even though replacement heifers are retained and developed by the producer, the producer is expected to "purchase" the heifer calf from themselves; therefore, heifer calf receipts still account for the sales of all heifer calves. The total cost of developing a replacement heifer, however, includes more than just the cost of retaining the calf. Cleere (2006) and Hersom et al. (2010) estimate the cost of retaining the calf only accounts for 53 percent of the total development costs. The budget here shows the total development costs based on this relationship.

Animal Health

Veterinary costs include the value of vaccines, medicines, veterinary services, and fertility/pregnancy testing. Steer and heifer calves are branded, dehorned, and vaccinated within one to three months of birth, assuming calves are 14 days or older for vaccinations and the bull calves are old enough to be castrated (Bagley, 2001). Vaccination costs are represented as a total per cow-calf pair per recommendations from the focus group.

Labor

Most ranchers in this area utilize little hired labor, but the Wyoming Beef Cattle Producer Survey indicated a primary source of labor for many operations came from family, volunteer, or weekend help (Nagler et al., 2006). Labor for hauling, gathering, feeding, fence repair, irrigation, salting, checking cows, and moving pastures is therefore not included as a cost. However, the budget assumes a fixed amount of custom labor as necessary, and hourly wages for family and volunteer help are not used in this analysis based on recommendations from the focus group interview (SAREC, 2010). Returns reported here represent returns to management and labor in the enterprise budget.

Transportation

Transportation costs are associated with liability, fuel, inspection, and marketing commission on sold livestock. A flat rate was provided by the focus group assuming a rancher from the area will use a trucking company to travel less than 100 miles to a sale barn or their own line of transportation uses (i.e., truck and trailer).

General Overhead

General overhead consists of all the fixed costs for the enterprise. These values are based on reported rates or percentages of general farm or ranch management. North Dakota State University reports general overhead costs consisting of the DIRTI five – Depreciation, Interest, Repairs, Taxes, and Insurance (Hughes & Aakre, 2002). The values utilized for depreciation and interest on inventory were provided by a previous budget from the University of Idaho Extension (Gray, 2008). The guidelines in the American Agricultural Economics Association (AAEA) Handbook for Commodity Costs and Returns (AAEA, 2000) were followed to calculate depreciation as capital services cost. Initial Idaho 2008 values for the inventory of depreciable assets were inflated using the producer prices paid index (FRED, 2010; BLS, 2010) and assumed the same salvage values by proportion (AAEA, 2000; Gray, 2008).

Annual taxes and insurance for intermediary/machinery and real estate were proportioned as well from these newly calculated purchase prices and salvage values based on the Survey of Agriculture Credit Conditions in 2008 for Wyoming [intermediary/machinery (7.29 percent) and real estate (6.97 percent)] (Federal Reserve Bank of Kansas City, 2008). Interest rates for operating expenses used the real rate averages for the mountain region that includes Wyoming, Colorado, and New Mexico, which appear to be a similar rate as intermediary/ machinery (7.29 percent) (Federal Reserve Bank of Kansas City, 2008).

Facility repairs and maintenance is presented in dollars per unit of a 200-head herd, a value confirmed by the producer focus group (SAREC, 2010). Maintenance and repairs on machinery is estimated to be 5 percent of the value of the machinery (Hughes & Aakre, 2002; Strauch, 2008). Insurance is not included for this analysis based on comments of the producer focus group. In this example, producers only account for liability in transportation and marketing cost (SAREC, 2010).

Taxes reported in this budget account for agricultural land holdings at a rate of 9.5 percent based on the Wyoming Department of Revenue (2010). As defined by the Wyoming Department of Revenue property tax system, "Agricultural land means land which has been used or employed during the previous two (2) years and presently is being used and employed for the primary purpose of obtaining a monetary profit as agricultural or horticultural use or any combination thereof is to be agricultural land for the purpose of tax assessment unless legally zoned otherwise by a zoning authority. The property tax is on the residence and any additional structures and land that are appraised at market value for the agriculture holdings (2010)."

Hay equipment and other production investments are not included in this budget as these are considered separate enterprises from the cow/calf enterprise. Only equipment, buildings, and improvements necessary for cattle production are used in this budget development (Gray, 2008). Furthermore, the producer focus group members believed they do not really own any haying equipment; they only rent or contract custom labor to produce hay as part of operation (SAREC, 2010).

Table 3. Enterprise Budget for Cow-Calf Ranch in Southeastern Wyoming

Receipts	Number of head	Average weight	Units	Sale price/unit	Value/cow	Total value
Steers	90	550	lbs	\$1.18	\$292.05	\$58,410.00
Heifers	90	500	lbs	\$1.05	\$236.25	\$47,250.00
Cull cows	30	1200	lbs	\$0.43	\$77.40	\$15,480.00
Cull bulls	2	1800	lbs	\$0.60	\$10.80	\$2,160.00
Total receipts					\$616.50	\$123,300.00
Expenses	Units/cow	Total units	Units	Cost per unit	Cost/cow	Total costs
Variable costs						
Feed Expense						
Grass hay	0.75	150	tons	\$106.00	\$79.50	\$15,900.00
Alfalfa hay	0.5	100	tons	\$116.00	\$58.00	\$11,600.00
Salt/mineral (50/50 mix)	0.25	7500	lbs	\$0.61	\$22.88	\$4,575.00
Protein supplement tubs	1	200	lbs	\$0.41	\$36.90	\$7,380.00
Federal grazing ¹	1.15	3.45	AUMs	\$17.99	\$62.07	\$12,413.10
State land grazing ²	1.15	1.38	AUMs	\$17.99	\$24.83	\$4,965.24
Private pasture lease grazing ³	1.15	2.875	AUMs	\$16.86	\$46.00	\$9,200.00
Total feed costs					\$330.17	\$66,033.34
Reproduction costs						
Breeding bulls ⁴	0.01	2	bull	\$4,930.00	\$49.30	\$9,860.00
Replacement heifers/cows ⁵	0.17	34	heifer	\$990.57	\$168.40	\$33,679.25
Total reproductive costs					\$217.70	\$43,539.25
Animal health						
Veterinarian service	1	200	cow	\$3.00	\$3.00	\$600.00
Medication & supplies	1	200	cow	\$2.00	\$2.00	\$400.00
Vaccinations-cow/calf pair	1	200	cow	\$15.00	\$15.00	\$3,000.00
Bull testing & vaccine	0.035	7	bull	\$30.00	\$1.05	\$210.00
Total animal health					\$21.05	\$4,210.00
Miscellaneous labor						
Custom labor ⁶	1	total cost		\$1,500.00	\$7.50	\$1,500.00
Total labor					\$7.50	\$1,500.00

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