

# Nebraska Cattle Budgets

## Instructions for Using the *Nebraska Cattle Budgets Spreadsheet*

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Today's beef cattle producer is faced with an ever increasing diversity of inputs, especially feedstuffs. This makes it more important to consider ways to optimally allocate financial resources. The use of a livestock budget can aid in financial management, production and marketing decisions by enabling producers to summarize the enterprise's expenses into a breakeven selling price. This document describes several budgets for cow-calf, cattle backgrounding and cattle feeding operations used in the companion Excel® spreadsheet *Cattle Budgets*. The calculation procedures, formats and enterprise specifications all build on cattle budgets used in previous UNL publications and recommendations. The types of cattle enterprises are described below and in the Excel budget file. The values provided in the sample budgets serve as guidelines *only*. The spreadsheet should be changed to reflect your unique production situation. This document describes how to do this.

### Using the Cattle Budget Spreadsheet

#### Inputs

The first worksheet in the companion spreadsheet is labeled *Inputs* and contains the values (prices, quantities, interest rates, etc.) used in the sample budget calculations. Five sections are included in the *Inputs* page. The first section, labeled *Feedstuffs*, lists several feed ingredients available for use, the price per unit of each feedstuff and the amount of each feedstuff used in each ration of the cow-calf, backgrounding and feeding operations. The next four sections include *Other Cash Costs*, *Ownership and Management Costs*, *Production Parameters* and *Cattle Prices and Values*. The *Inputs* page allows producers to customize a budget that fits their enterprise.

- Values (amounts, prices, weights, etc.) in blue on the *Inputs* page can be changed and will automatically update the appropriate *Output* page(s). (You will only be able to click on those cells whose content can be changed.)



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- Changes made in *Column D* are global changes and will change all budgets that use that particular *Column D* value.
- Changes made in *Columns F* through *W* will update the value(s) in the appropriate budget specified at the top of the respective column. *Column X* shows the unit measurements for *Columns F* through *W*.
- Clicking the gray buttons labeled *C1* through *F4* (located near the top of the *Inputs* spreadsheet) in *Columns F* through *W* will allow you to access the specified budget directly.
- Colored tabs at the bottom of the screen will direct you to the desired budget. From the output pages, you can return to the *Inputs* page by either clicking on the tab at the bottom of the screen labeled *Inputs* or by clicking on the gray *Inputs* button at the top of each *Output* page. If you have clicked on any of the gray buttons and an error message appears, close the window. Next, click on *Tools* on the menu bar at the top of the screen and scroll down to *Macro*. Under *Macro* choose *Security* and select the low security setting. If you still are not allowed to utilize the gray buttons at the top of the spreadsheet, close the spreadsheet and reopen it. The pages following the *Inputs* page include each operation (cow-calf, backgrounding and finishing) evaluated under several scenarios.

### Cow-Calf Operation Budgets (C Outputs)

The nine pages following the *Inputs* page include budgets for a cow-calf operation labeled *C1-Output* to *C9-Output* (aqua colored tabs). It is important to note that all calculations in the cow-calf budgets are on a cow unit basis. A cow unit includes the cow, her calf until weaning and her proportionate share of the replacement heifer and bull. Therefore, costs per cow unit reflect those for all animals contributing to calf production. The cow-calf operation scenarios include:

*C1-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd, Ranch Area

- Situation: Winter grazing with minimum hay

*C2-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd, Ranch Area

- Situation: Winter grazing and aftergrowth grazing

*C3-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd, Crop Area

- Situation: Winter on corn stalks and alfalfa hay

*C4-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd, Crop Area

- Situation: Winter on corn stalks, hay, supplement

*C5-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd, Ranch Area

- Situation: Winter on grass, hay, WDGS (Wet Distillers Grain plus Solubles) supplement

*C6-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd

- Situation: Cows fed in lot on WDGS and hay, winter on cornstalks

*C7-Output*: Budgeted Annual Economic Costs Per Cow Unit, Beef Cow Herd

- Situation: Cows fed in lot on hay and corn silage, year-round

*C8-Output*: Budgeted Economic Costs of Growing Replacement Heifer, Ranch Area

- Situation: Conventional costs from weaning of the heifer to calving

*C9-Output*: Budgeted Economic Costs of Growing Replacement Heifer

- Situation: Costs from weaning of the heifer to calving in a lot with DDGS (Dried Distillers Grain with Solubles)

### Backgrounding Operation Budgets (B Outputs)

The next five pages in the Excel spreadsheet include budgets for a backgrounding operation and are labeled *B1-Output* to *B5-Output*. The tabs for these budgets are yellow. The backgrounding operation scenarios include:

*B1-Output*: Budgeted Cost of Growing 500 lb Steer Calves, 180 Days, Ranch Area

- Situation: Wintering, prairie hay, medium frame, 1.20 lb gain/day

*B2-Output*: Budgeted Cost of Growing 500 lb Steer Calves, 180 Days, Ranch Area

- Situation: Wintering period using corn stalks and DDGS, medium frame, 1.40 lb gain/day

*B3-Output*: Budgeted Cost of Growing 500 lb Steer Calves, 180 Days, Crop Area

- Situation: Wintering period using corn stalks and alfalfa hay, 1.20 lb gain/day

*B4-Output*: Budgeted Cost of Growing 715 lb Steer Calves, 120 Days, Ranch Area

- Situation: Buying in spring, selling off grass in fall, 1.80 lb gain/day

*B5-Output*: Budgeted Cost of Growing 550 lb Steer Calves, 100 Days, Crop Area

- Situation: Backgrounding, 2.30 lb gain/day

## Finishing Operation Budgets (F Outputs)

The last three pages in the spreadsheet include budgets for a finishing operation. These orange tabs are labeled *F1-Output* through *F4-Output*. The finishing operation scenarios include:

F1-Output: Budgeted Cost of Feeding Out 650 lb Steer Calves, 200 Days on Feed

- Situation: High concentrate ration without ethanol byproducts, 3.00 lb ADG, 21 lbs DMI (dry matter intake)

F2-Output: Budgeted Cost of Feeding Out 650 lb Steer Calves, 169 Days on Feed

- Situation: High concentrate ration with ethanol byproducts, 3.56 lb ADG, 21.98 lbs DMI

F3-Output: Budgeted Cost of Feeding Out 800 lb Steer Calves, 170 Days on Feed

- Situation: High concentrate ration without ethanol byproducts, 3.27 lb ADG, 23.6 lbs DMI

F4-Output: Budgeted Cost of Feeding Out 800 lb Steer Calves, 144 Days on Feed

- Situation: High concentrate ration with ethanol byproducts, 3.83 lb ADG, 24.58 lbs DMI

## Assumptions for Cow/Calf Budgets

Budgets *C1-Output*, *C2-Output*, *C5-Output* and *C8-Output* represent operations in a ranch area (e.g., Nebraska Sandhills) while budgets *C3-Output* and *C4-Output* are for diversified crop (farm) areas of Nebraska. Budget *C1-Output* focuses on using as much dormant-season grazing as possible while *C2-Output* incorporates more hay during the winter. Cornstalk pasture is used for winter feeding in budgets *C3-Output* and *C4-Output*. Budgets *C8-Output* and *C9-Output* are replacement heifer program budgets. Unlike the other cow/calf budgets that are on a cow-unit basis, these two heifer budgets are on a per head basis. The replacement heifer budgets separate the young females from the cow budgets and evaluate them as a separate enterprise; however, the replacement heifer budgets provide some variation in feeding rations from that assumed in the cow/calf budgets. Budgets *C5-Output*, *C6-Output* and *C9-Output* incorporate the use of distillers co-products into the rations.

Note that *C5-Output* is identical to *C1-Output*, with the exception of the protein source used. The 32 percent protein supplement used in *C1-Output* is replaced by wet distillers grain plus solubles (WDGS) in *C5-Output*. Budget *C6-Output* involves feeding WDGS to cows in a dry-lot situation. This diet uses WDGS mixed with ground corn stalks in a bunker and packed. The mixture contains 70 percent WDGS and 30 percent corn stalks.

No more than 7 pounds (dry matter basis) of WDGS was fed per head per day. Additional dietary needs not met by the mixture were met using prairie hay. It is important to note that when feeding distillers grains, generally no additional phosphorus is needed in cow/calf rations, so use the “Mineral without Phosphorus” as the mineral source in these types of rations. In addition, limestone is added to rations using distillers grains in order to keep the calcium to phosphorus ratio greater than 1.4:1.0.

Budgets *C1-Output* to *C7-Output* assume that replacement heifers are selected from the calf crop and grown. Sales of cull cows and cull heifers are credited against total costs per cow unit. Bulls are assumed to be purchased, and annual cash sales of cull bulls are less than the cash purchase price of bulls, so there is a net cost for bulls. Death loss of the breeding herd is calculated as reductions in the sales of cull cows, heifers and bulls. An opportunity cost of the replacement heifer calf is charged against the cowherd by reducing credits of sales of cull cattle. The opportunity cost of the replacement heifers net of culls adjusted for death loss is the economic equivalent of a depreciation charge for the cows.

Budgets *C1-Output* through *C7-Output* are on a cow unit basis. A cow unit includes the cow, her calf until weaning and her proportionate share of the replacement heifer and bull. In the baseline scenario, the cow unit is comprised of 0.84 cow, 0.16 replacement heifer, 0.20 heifer calf, and 0.04 bull, for example. Therefore, costs per cow unit reflect those for all animals contributing to calf production. Costs per calf produced are dependent upon the number of calves produced per cow unit. Therefore, three weaning rates (i.e. 85 percent, 90 percent and 92 percent) were included at the bottom of the budget to illustrate costs per calf under varying rates.

Other assumptions in the baseline scenarios provided in the spreadsheet in the cow/calf budgets (*C1-Output* through *C9-Output*) include:

1. Mature cows in spring calving cowherds average 1,100 pounds (1.1 animal units).
2. Heifers calve as two-year-olds.
3. Annual replacement rate of cows is 16 percent (applicable to *C1-Output* through *C7-Output*). The cow death loss is 1.5 percent which leaves 14.5 percent cull cows sold per year. The value of culls is \$72.50 per cow unit (1000 lbs x 0.145 x \$0.50 = \$72.50 per cow unit).
4. Twenty percent of calves are retained for replacements each year. Twenty percent of those replacement heifers are culled each year (leaving a total of 16 replacement heifers for a 100-cow herd).

5. Bulls are retained for four years and service 25 cows per year. The purchase price of bulls is \$3,500 per head; the salvage value is \$1,008 per head (1,600 lbs at \$0.63/lb), producing an average value of \$2,254 per head  $[(\$3,500 + \$1,008) \div 2]$ .
6. Interest charged on animals in the herd is calculated by multiplying the interest rate times the value of one cow at \$900 per head, plus the value of 20 percent of the heifer valued at \$750 per head, plus the average value of a bull (see Number 5 above) times the number of bulls per cow (25).
7. The growing season and dormant season each consist of six months.
8. Land costs, including taxes, are not charged directly but are reflected in the charges for pasture and hay.
9. Labor does not include labor for haying, upkeep of fences or water. Labor for these items is reflected in the market prices of hay and grazing land.
10. An arbitrary management charge is included in each cow/calf budget. The arbitrary management fee is designed to reflect the relative management input and number of decisions involved in each enterprise. Labor and management may not always be included as a cash cost in the cow/calf enterprise; however, family living costs must be covered by farm or ranch enterprises. For example, in budget *C1-Output*, \$52.50 per head is charged for labor and \$20.00 per head for management. The sum of these, \$72.50 per cow unit, will provide a family living income of \$36,250 per year if there are 500 cow units in the herd.
11. Items assumed to be purchased off the ranch or farm are charged interest at a rate of 8.5 percent. Breeding livestock are charged 7.0 percent interest to reflect a real rate of interest. Dormant and growing season grazing and hay (includes stalk pasture, alfalfa hay, prairie hay and baled corn stalks) are assumed home-grown in the ranch cow/calf budgets and are not charged interest. In crop areas, grazing and hay (includes stalk pasture, alfalfa hay, prairie hay and baled corn stalks) in addition to corn and corn silage are assumed home-grown and are not charged interest. All other feeds listed in the budgets, regardless of area (ranch or crop), are charged interest.
12. For those who prefer to use land costs, taxes and interest rather than including them in haying and grazing costs, the illustrations in *Tables 1-4* may be useful for estimating acreage requirements per cow unit.

**Table 1. AUM<sup>1</sup> Requirements per Cow Unit**

<i>Dormant Season: 6 months</i>	<i>Cow/ Unit</i>		<i>AU Equiv.</i>		<i>Mos.</i>		<i>AUM Needs</i>
Cow:	.84	x	1.10	x	6	=	5.54
Bred Heifer:	.16	x	1.00	x	6	=	.96
Heifer Calf:	.20	x	.55	x	6	=	.66
Bull:	.04	x	1.50	x	6	=	.36
	<u>1.24</u>						<u>7.52 AUMs</u>
Dormant Season Needs per Cow Unit							
<i>Growing Season: 6 months</i>	<i>Cow/ Unit</i>		<i>AU Equiv.</i>		<i>Mos.</i>		<i>AUM Needs</i>
Cow-Calf Pair:	1.00	x	1.30	x	6	=	7.80
Heifer:	.20	x	.70	x	6	=	.84
Bull:	.04	x	1.50	x	6	=	.36
	<u>1.24</u>						<u>9.00 AUMs</u>
Growing Season Needs per Cow Unit							

<sup>1</sup>AUMs: Animal Unit Month or the forage requirement for one month of a 1,000 lb cow of average milking ability.

**Table 2. Forage Production per Acre (Varies with Site and Condition)**

Example:

Wet Meadow: 1 ton hay per acre + 0.5 AUM of dormant season grazing  
Upland Hay: 0.5 ton per acre  
Hay Equivalent: 1 ton hay = 2.4 AUMs  
Range: 0.6 AUM per acre growing or dormant seasons

**Table 3. Calculating Acres Required per Cow Unit**

Example: *Budget C1*: Forage requirements are 0.75 ton hay and 14.25 AUMs pasture.  
0.75 ton hay consumed = 1.5 acres native hay production  
14.25 AUMs grazing = 23.8 acres range needed (14.25 AUMs ÷ 0.6 AUMs per acre)  
Acres required per cow unit = 1.5 acres native hay + 23.8 acres range = 25.3 acres

Example: *Budget C2* (wet meadow assumed)  
2.0 tons of hay ÷ 1 ton per acre = 2 acres per cow unit  
1.5 AUMs dormant season requirement - 0.5 from meadow aftergrowth = 1 AUM range  
1 AUM dormant season + 9 AUM growing season = 10 AUMs  
10 AUMs = 16.7 acres grazing needed (10 AUMs ÷ 0.6 AUMs per acre)  
Acres required per cow unit = 16.7 acres grazing + 2.0 acres meadow = 18.7 acres

**Table 4. Calculating Costs per Cwt of Calf Produced**

Example: *Budget C1*: Cost per calf produced =  
Net cost per cow ÷ calves weaned per cow = \$775.52 ÷ 0.90 = \$821.32  
Cost per cwt of calf produced =  
Cost per calf ÷ calf weight in cwt = \$821.32 ÷ 5.50 = \$149.33

### Assumptions for Cattle Backgrounding and Cattle Finishing Budgets

In addition to the nine cow/calf budgets, the spreadsheet also includes five cattle backgrounding (*B1-Output* through *B5-Output*) and four cattle finishing (*F1-Output* through *F4-Output*) budgets. Although similar to the cow/calf budgets, the backgrounding and finishing budgets are on a per-head basis rather than a cow-unit basis.

Budgets *B1-Output*, *B2-Output* and *B4-Output* are designed for backgrounding in ranch areas while budgets *B3-Output* and *B5-Output* are for Nebraska crop areas. Note that *B2-Output* is identical to *B3-Output*, except for the protein source. The alfalfa hay and corn used in *B3-Output* is replaced with corn silage and dried distillers grains with solubles (DDGS) in *B2-Output*. It is important to note that when feeding any type of distillers grains in backgrounding rations, additional phosphorus is not needed in the ration, so use the “Mineral without Phosphorus” as the mineral source. In addition, limestone is added to rations using distillers grains to keep the calcium to phosphorus ratio greater than 1.4:1.0.

Budgets *F1-Output* and *F2-Output* are designed for calf finishing operations while budgets *F3-Output* and *F4-Output* are for yearling finishing operations in Nebraska. Note that *F1-Output* is identical to *F2-Output* and *F3-Output* is identical to *F4-Output*, with one exception. Thirty percent of the ration (on a dry matter basis) is wet distillers grains plus solubles (WDGS) in *F2-Output* and *F4-Output*, replacing an equal amount of corn. It is important to note that the Feedlot Supplement (with urea) should be used for rations with no ethanol byproducts. This supplement contains the following as a percentage of the ration on a dry matter basis: 1.5 percent urea, 1.5 percent limestone, 0.5 percent potassium, 0.3 percent salt and 0.1 percent trace minerals, vitamins A, D and E and drug additives. The Feedlot Supplement (without urea) should be used in conjunction with rations containing ethanol byproducts. This supplement contains the following as a percentage of the ration on a dry matter basis: 1.5 percent limestone; 0.5 percent potassium, 0.3 percent salt and 0.1 percent trace minerals, vitamins A, D and E and drug additives.

Other assumptions in the backgrounding (*B1-Output* through *B5-Output*) and finishing (*F1-Output* through *F4-Output*) budgets include the following:

1. Interest on animals in the backgrounding and finishing budgets is charged on the beginning value of the animal for the time the animal is backgrounded or finished. For example, in *B1-Output*, the steer is backgrounded for 180 days (0.49 years) with a beginning weight of 500 lbs. So, the interest on the steer for the backgrounding period is the beginning value (\$650 per head) times the interest rate on animals (7.5 percent) times the period of time the animal is backgrounded ( $180 \text{ days}/365 = 0.49 \text{ yr}$ ) or \$24.04 per head.
2. The growing season and dormant season consist of six months each (applicable to *B4-Output*).
3. Land costs, including taxes, are not charged directly but are reflected in the pasture and hay charges.
4. Labor does not include labor for haying, fence upkeep or water. Labor for these items is reflected in the market prices of hay and grazing land.
5. An arbitrary management charge is included in each backgrounding and finishing budget. The arbitrary management fee is designed to reflect the relative management input and number of decisions involved in each enterprise. Labor and management may not always be included as a cash cost in the backgrounding or finishing enterprise. However, the family living costs must be covered by enterprises of the farm or ranch. For example, in *B1-Output*, \$12.50 per head is charged for labor and \$7.00 per head for management. The sum of these, \$19.50 per head, will contribute \$9,750 per year to family living income if there are 500 animals in the herd.
6. Items assumed to be purchased off the ranch, farm or feedyard are charged interest at a rate of 8.5 percent. Backgrounding and finishing livestock are charged 7.5 percent interest to reflect a real rate of interest. Dormant and growing season grazing and

hay (includes stalk pasture, alfalfa hay, prairie hay and baled corn stalks) are assumed home-grown in the backgrounding budgets and are not charged interest. In crop areas, grazing and hay in addition to corn and corn silage are assumed home-grown and are not charged interest. All other feeds listed in the budgets, regardless of area (ranch or crop), are charged interest. All feeds are charged interest in the cattle finishing budgets.

## Summary

Remember that the values provided in the sample budgets serve as guidelines only. Values will differ between operations with different feeding rations and practices. Users should change these values to reflect the values in their operations.

## Contacts

For further information on the following topics, contact the UNL extension specialists listed:

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