
Using Partial Budgeting to Analyze Drought Management Strategies

Quick Notes...

To minimize financial hardship under drought conditions, partial budgeting is a tool that can be used to compare different management strategies.

It is important to develop your own numbers for the drought strategies you are considering. Everyone's situation is unique and should be evaluated individually.

As drought conditions continue, increasing numbers of livestock producers will be faced with some critical decisions relating to their breeding herds. Poor forage conditions and shortened grazing seasons will force producers to analyze different alternatives to cope with drought impacts.

Partial Budgeting

A partial budget is a valuable management tool used to analyze an incremental change in a given enterprise. By employing budget principles, a manager can compare the economic impact (costs and returns) of alternative drought plans.

Partial budgeting is based on the principle that changes made in the farm or ranch business due to drought conditions will have one or more of the following effects:

- 1) eliminate or reduce some costs;
- 2) eliminate or reduce some returns;
- 3) increase some costs;
- 4) increase some returns.

The net effect will be the sum of positive economic effects minus the sum of negative economic effects.

Drought Example Analysis

This article is designed to help livestock producers analyze or compare different drought management strategies. To demonstrate the process, four possible strategies are compared. These represent only four of many possible drought management strategies to consider.

1. Transport livestock (cow pairs) to another source of forage.
2. Drylot livestock (both cows and calves).
3. Liquidate livestock and buy back in 1997.
4. Wean early, drylot calves, sell cows, buy back cow/calf pairs in 1997.

Worksheet 1 shows the basic format of a typical partial budget. The positive impacts (reduced costs and additional returns) are listed on the top of the budget. The negative impacts (additional costs and reduced returns) are listed on the lower part of the budget.

Worksheet 1: Partial Budget Format

Proposed Change: _____

Assumptions: _____

Key Factors: _____

Positive Impacts:

Reduced Costs

Total Reduced Costs (A) \$ _____

Additional Returns

Total Additional Returns (B) \$ _____

Total Positive Impacts (A + B) (C) \$ _____

Negative Impacts:

Additional Costs

Total Additional Costs (D) \$ _____

Reduced Returns

Total Reduced Returns (E) \$ _____

Total Negative Impacts (D + E) (F) \$ _____

TOTAL NET EFFECT (C - F) = \$ _____

The following analysis is used to demonstrate how partial budgeting can be used to compare the four different drought management strategies. The results of the analysis are listed in Worksheet 2. See the appendices for detailed budgets. The strategies can be ranked according to the net effect. Pay careful attention to the assumptions made in the analysis. Different assumptions can change the results substantially.

The least costly strategy, based on the assumptions, is Strategy 3. The cost of this plan would be approximately \$9,507 or \$38.03 per cow. Second in comparison was Strategy 4 with an expected cost of \$15,458 or \$61.83 per cow. Retaining ownership appears to be much more costly due to the high cost of feed and low

market prices. Strategy 1 (transport cow/calf pairs to grass) has an expected loss of \$21,311 or \$85.24 per cow and Strategy 2 (drylot both cows and calves) has an expected loss of \$31,050 or \$124.20 per cow.

Certainly there are other biological, genetic, and related issues that must be considered. The availability of cow/calf pairs adapted to your environment is another important concern, particularly ranches located at higher elevations. Current carryover hay and forage inventories, availability of other crops for feed, and uncertainty about market conditions in the coming year, may play an important role in the final decision.

Worksheet 2: Partial Budget Drought Analysis Results

Strategy	1 Transport to <u>Grass</u>	2 Drylot Pairs	3 Liquidate & <u>Buy Back</u>	4 Early Wean Sell Cows <u>Drylot Calves</u>
Positive Impacts: Reduced Costs	790	790	51,361	50,156
Additional Returns	0	0	164,830	125,080
Total Positive Impacts	\$790	\$790	\$216,191	\$175,236
Negative Impacts: Additional Costs	22,101	31,840	169,640	177,694
Reduced Returns	0	0	56,058	13,000
Total Negative Impacts	\$22,101	\$31,840	\$225,568	\$190,694
Net Effect	\$-21,311	\$-31,050	\$-9,507	\$-15,458
Net Effect Per Cow	\$-85.24	\$-124.20	\$-38.03	\$-61.83

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Appendix A

Strategy 1 - Transport Cow/Calf Pairs to Grass

- Assumptions:
1. 250 cows with 45 replacement heifers
 2. Pull off of Federal grazing 2 months early
 3. Transport 500 miles one-way
\$1.10 per loaded mile
30 pairs per load
 4. Pasture \$14/AUM for 3 months
 5. 30 day feed supply around Ranch

- Key Factors:
1. Transportation Costs (Distance)
 2. Pasture Rental Rate
 3. Normal year summer pasture cost

Positive Impacts:

Reduced Costs

Federal Grazing

250 pairs x \$1.36 x 2 months = \$ 680

45 repl. heifers x .9 x \$1.36 x 2 mo. = 110

Total Reduced Costs (A) \$ 790

Additional Returns

None

Total Additional Returns (B) \$ 0

Total Positive Impacts (A+B) (C) \$ 790

Negative Impacts:

Additional Costs

Transportation

Cow/Calf Pairs: 8 Trucks x 1000 miles x \$1.10 = \$ 8,800

Replacements: 1 Truck x 1000 miles x \$1.10 = \$ 1,100

Pasture Rent

250 pairs x \$14/AUM x 3 months = \$10,500

45 repl. heifers x .9 x \$14/AUM x 3 months = \$ 1,701

Total Additional Costs (D) \$22,101

Reduced Returns

None

Total Reduced Returns (E) \$ 0

Total Negative Impacts (D+E) (F) \$22,101

TOTAL NET EFFECT (C-F) = \$-21,311 or \$-85.24 per cow

Appendix B

Strategy 2 - Drylotting Cow/Calf Pairs

- Assumptions:
1. 250 cows with 45 replacement heifers
 2. Drylot cow/calf pairs for 3 months
 3. Hay 25 lbs. per day (\$80/ton)
 4. Barley 3 1/3 lbs. per day (.07/lb. or 3.36/bu.)
 5. 30 days clean-up around the Ranch

- Key Factor(s):
1. Feed Costs
 2. Normal year summer pasture costs

Positive Impacts:

Reduced Costs

Federal Grazing

250 pairs x \$1.36 x 2 months = \$ 680

45 heifers x .9 x \$1.36 x 2 months = \$ 110

Total Reduced Costs (A) \$ 790

Additional Returns

None

Total Additional Returns. (B) \$ 0

Total Positive Impacts (A+B) (C) \$ 790

Negative Impacts:

Additional Costs

Hay

25 lbs. x 90 days x 250 pairs x \$.04/lb. = \$22,500

20 lbs. x 90 days x 45 repl. x \$.04/lb. = \$ 3,240

Barley

3 1/3 lbs. x 90 days x 250 pairs x \$.07/lb. = \$ 5,249

3 lbs. x 90 days x 45 repl. x \$.07/lb. = 851

Total Additional Costs (D) \$31,840

Reduced Returns

None

Total Reduced Returns (E) \$ 0

Total Negative Impacts (D+E) (F) \$31,840

TOTAL NET EFFECT (C-F) = \$-31,050 or \$-124.20 per cow

Appendix C

Strategy 3 - Liquidate Cow/Calf Pairs in 1996 and Buy Back in 1997

- Assumptions:
1. 250 cows with 45 replacement heifers
 2. Sell cow/calf pairs for \$550 per pair, 45 repl. heifers for \$400
 3. Buy back in 1997 for \$650 per pair
 4. Sales income draws interest at 8% for 9 months (Aug. '96 - April '97)

- Key Factor(s)
1. Cow/calf pair sale price
 2. Cow/calf pair buy back price
 3. Availability of cow/calf pairs for buy back
 4. Interest income

Positive Impacts:

Reduced Costs

Federal Grazing

250 pairs x \$1.36 x 2 months = \$ 680

45 heifers x .9 x \$1.36 x 2 months = \$ 110

Winter Feeding

Hay - 2.1 ton x 250 hd x \$75 = \$ 39,375

Grain - .3 cwt x 250 x \$13 = \$ 975

Salt/Min. - 30 lbs. x 250 x .15 = \$ 1,125

Other Variable Expenses

Labor, Fuel & Utilities - 48.51 x 9/12 x 250 = \$ 9,096

Total Reduced Costs (A) \$ 51,361

Additional Returns

Cow/Calf Pairs - 250 hd x \$550 = \$137,500

Replacement heifers - 45 hd. x \$400 = \$ 18,000

Interest Income - \$155,500 x 8% x 9/12 of a year = \$ 9,330

Total Additional Returns (B) \$164,830

Total Positive Impacts (A+B) (C) \$216,191

Negative Impacts

Additional Costs

Marketing Expenses: 3% of gross (.03 x \$155,500) = \$ 4,665

Transportation: 9 trucks x 250 miles x \$1.10 = \$ 2,475

Buy Back: 250 cow/calf pairs x \$650.00 = \$162,500

Total Additional Costs. (D) \$169,640

Reduced Returns

Steers: 104 hd x 450 lbs. x .62 = \$ 29,016

Heifers: 59 hd. x 425 lbs. x .56 = \$ 14,042

Cull Cows: 38 hd. x \$0.31 x 1100 lbs. = \$ 13,000

Total Reduced Returns (E) \$ 56,058

Total Negative Impacts (D+E). (F) \$225,568

TOTAL NET EFFECT (C-F) = \$-9,507 or \$-38.03 per cow

Appendix D

Strategy 4 - Early Weaning, Drylotting Calves, Selling Cows, Buying Back Cow-Calf Pairs in 1997

- Assumptions:
1. Sell cows and replacement heifers for \$480
 2. Buy pairs back in 1997 for \$650 per pair
 3. Sales income earn interest at 8% for 9 months

- Key Factor(s)
1. Cow sale price
 2. Cow/calf pair buy back price
 3. Availability of cow/calf pairs for buy back
 4. Interest income
 5. Feed costs (calves)

Positive Impacts:

Reduced Costs

Federal Grazing	= \$ 790
Winter Feeding	= \$ 40,271
Other Variable Expenses (Labor, Fuel & Utilities)	= \$ <u>9,096</u>
Total Reduced Costs	(A) \$ 50,156

Additional Returns

Cows - 250 hd x 400	= \$100,000
Replacement heifers - 45 hd. x 400	\$ 18,000
Interest Income - 118,000 x 8% x 9/12 of a year	= \$ <u>7,080</u>
Total Additional Returns	(B) \$125,080

Total Positive Impacts (A+B) (C) \$175,236

Negative Impacts:

Additional Costs

Marketing Expenses: 3% of gross (.03 x \$118,000) (Comm., Brand Insp., Health Inspection, etc.)	= \$ 3,540
Transportation: 8 trucks x 250 miles x \$1.10	= \$ 2,200
Feeding Calves:	
Hay - 10 lbs. x 90 days x .0375 x 208 hd.	= \$ 7,020
Grain - 1 lb. x 90 days x .13 x 208 hd.	= \$ 2,434
Cow Purchase: 250 pairs x \$650	= <u>\$162,500</u>
Total Additional Costs	(D) \$177,694

Reduced Returns

Cull Cows: 38 hd. x \$0.31 x 1100 lbs.	= \$ <u>13,000</u>
Total Reduced Returns	(E) \$ 13,000

Total Negative Impacts (D+E). (F) \$190,694

TOTAL NET EFFECT (C-F) = \$-15,458 or \$-61.83/cow