



**Master Stockman Ranch
Management Institute**
W Y O M I N G

UNIVERSITY
of WYOMING
EXTENSION



Wyoming Ranch Tools

Master Hay Grower

Bridger Feuz

UW Extension - Livestock Marketing Specialist

UNIVERSITY
of WYOMING
EXTENSION

Agenda

- Why economic analysis
- Wyoming Ranch Tools
- Partial Budgeting
 - Buy Hay / Sell Cows Example
- Net Present Value
 - Center Pivot Investment Example

Overview



**GOOD BUSINESS IS
GOOD BUSINESS**



Overview



Dealing with change

- Whole Farm/Enterprise Budget
 - How do you accurately depict the implications of a change in a Farm or Enterprise Budget
- Improving Yield
 - Can you just change the yield in your budget and evaluate the change in revenue?
 - Why/Why not?



The screenshot shows a web browser window displaying the 'Wyoming Ranch Tools' website. The browser's address bar shows 'http://uwyoextension.org' and the page title is 'Wyoming Ranch Tools'. The website header features the title 'Wyoming Ranch Tools' and the University of Wyoming Extension logo. A navigation menu includes links for 'Partial Budget', 'NPV Tool', 'AUM Value', 'Genetic Investment', 'Stocking Rate', 'Sprayer Calibration', 'Fact Sheets', 'External Links', and 'Home'. The main content area has a heading 'Welcome to Wyoming Ranch Tools' and a sub-heading 'Designed and Maintained by Bridger Feuz, University of Wyoming – Livestock Marketing Specialist/Area Educator'. A paragraph explains the site's goal: 'The goal of this site is to provide usable tools to help ranchers (both large and small) be able to make better decisions, leading to sustainable operations. Each tool is accompanied with a fact sheet and instructions on utilizing the tool. If you don't see the tool you need here contact me at bmfeuz@uwyo.edu and let me know what you would like to have added.'

- **Partial Budget** – Use the partial budget tool to help make decisions such as; Should I sell calves or yearlings? Should I retain ownership on my heifers? What should I do with my cull cows? Should I buy hay or put up my own?
- **NPV Tool** – Use the Net Present Value (NPV) tool to make decisions when a significant capital investment is needed. The NPV tool also contains an EconoRange version which helps in making decisions on range and pasture improvement projects.

Goal

- Determine if you will be better or worse off
 - Not for determining overall profitability
 - Example;
 - If you are losing money selling calves and you decide to retain ownership, this analysis will tell you if you will be better financially. However, you may still lose money (Just less).
 - Go back to the whole farm budget to determine profitability

Partial Budgeting

- Useful as an intermediate term analysis
 - Best adapted to analyzing relatively small changes in the whole ranch plan
 - Contains only those income and expense items that will change if the proposed modification in the ranch plan is implemented
- Larger changes can be analyzed if incorporated with an enterprise budget or whole farm budget
- Result is an estimate of the increase or decrease in returns

Partial Budgeting

- Systematically organizes the answers to four questions
 1. What new or additional costs will be incurred?
 2. What current income will be lost or reduced?
 3. What new or additional income will be received?
 4. What current costs will be reduced or eliminated?

Partial Budget Tool							
Proposed Change							
Additional Costs				Additional Income			
Description	Number of Units	Price/ Cost	Total	Description	Number of Units	Price/ Cost	Total
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
Reduced Income				Reduced Costs			
Description	Number of Units	Price/ Cost	Total	Description	Number of Units	Price/ Cost	Total
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
			\$0.00				\$0.00
Total Additional Costs and Reduced Income			\$0.00	Total Additional Income and Reduced Costs			\$0.00
				Net Income or Loss			\$0.00

Partial Budget Example

- Current
 - 300 Cows
 - Only enough hay for 140 Cows
- Proposed Change
 - Buy Hay for the remaining 160 cows
 - Analyze the impact if shortage is a single year
 - Analyze over a 4 year time frame

What new or additional costs will be incurred?

- Hay
- Cow Maintenance
- Miscellaneous

What current income will be lost or reduced?

- Selling culled pairs
- Selling hay

What new or additional income will be received?

- Selling calves

Sensitivity Analysis

- Helps in the decision making process when dealing with changing conditions
 - Simple analysis
 - Worst Case – Most Likely – Best Case
 - More complex analysis
 - Worst – Best Case Grid

Partial Budgeting Assignment



How do you analyze an investment?

- Many times changing our operation requires a capital investment
 - If it will take more than 1 or 2 years to pay for the investment we need to do a net present value analysis (NPV)

Investments add Risk

- Future income from the investment is not guaranteed
- The same capital could be used for other investments (Opportunity Cost)
 - Savings
 - Money Market
 - Stocks
 - Etc.
- Often times a producer must borrow the capital

What is NPV?



Standard NPV Econo Range Instructions Resources

Wyoming Master Stockman Net Present Value Analysis

Investment	3,500.00
Interest Rate	5%

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Annual Cost	500.00	500.00	500.00	500.00	500.00	500.00	500.00	
Annual Revenue	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	
	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Annual Cost	500.00	500.00	500.00	500.00	500.00	500.00	500.00	500.00
Annual Revenue	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00

Results

5 year NPV	\$-1,227.02
10 year NPV	\$553.91
15 year NPV	\$1,949.32
Break Even Year	9

Year	Total Cost	Revenue	Net	Discount Factor	NPV	Cummulative NPV
1	\$4,000.00	\$1,000.00	\$-3,000.00	1	\$-3,000.00	\$-3,000.00
2	\$500.00	\$1,000.00	\$500.00	1.05	\$476.19	\$-2,523.81
3	\$500.00	\$1,000.00	\$500.00	1.10	\$453.51	\$-2,070.29
4	\$500.00	\$1,000.00	\$500.00	1.16	\$431.92	\$-1,638.38
5	\$500.00	\$1,000.00	\$500.00	1.22	\$411.35	\$-1,227.02

Center Pivot Example

- Yield Increase
 - Will you increase or decrease irrigated acreage?
 - How well are you currently able to cover the field with flood irrigation?
 - Will an increase in water efficiency allow you to irrigate longer?
- Pumping Costs
 - Diesel
 - Electric
- Can you add AUMs by grazing irrigated aftermath?

Uinta County Example

- Before
 - Flood Irrigated +/- 83 acres for about 2 tons per acre of grass hay
 - .5 AUM per acre aftermath grazing
- After
 - Center Pivot Sprinkler installed on 145 acres including 40 acres that was brush ground
 - Fuel cost is about \$6,000 per year
 - Diesel motor provides power
- 2004 Production
 - 60 acres in oats
 - Total yield = 215 tons = 1.5 tons/acre
 - $113.5 \text{ tons} / 60 \text{ acres} = 1.9 \text{ tons/acre}$ of oats
 - $101.5 / 85 = 1.2 \text{ tons/acre}$ of grass hay
 - Harvested a little over one AUM per acre of aftermath grazing

Cost Assumptions

- Investment Cost
 - Pivot + Establishment - \$950/acre
- Annual Costs
 - Pumping Cost - \$50/acre
 - Additional Harvest Cost - \$30/acre
 - Additional Fertilizer - \$20/acre
 - Operation and Maintenance - \$40/acre
- Total Annual Costs - \$140/acre

Return Assumptions

- Annual Returns
 - 1.75 tons/acre @ \$110/ton
 - .5 AUM/Acre Grazing @ \$17/AUM
- Total Returns
 - \$201/acre

NPV Tool

Standard NPV Econo Range Instructions Resources

Wyoming Master Stockman Net Present Value Analysis

Investment 950.00
Interest Rate 5%

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Annual Cost	140.00	140.00	140.00	140.00	140.00	140.00	140.00	
Annual Revenue	201.00	201.00	201.00	201.00	201.00	201.00	201.00	
	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Annual Cost	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00
Annual Revenue	201.00	201.00	201.00	201.00	201.00	201.00	201.00	201.00

Results

5 year NPV	\$-672.70
10 year NPV	\$-455.42
15 year NPV	\$-285.18
Break Even Year	None

NPV Tool

Standard NPV Econo Range Instructions Resources

Wyoming Master Stockman Net Present Value Analysis

Investment 475.00
Interest Rate 5%

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Annual Cost	140.00	140.00	140.00	140.00	140.00	140.00	140.00	
Annual Revenue	201.00	201.00	201.00	201.00	201.00	201.00	201.00	
	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Annual Cost	140.00	140.00	140.00	140.00	140.00	140.00	140.00	140.00
Annual Revenue	201.00	201.00	201.00	201.00	201.00	201.00	201.00	201.00

Results

5 year NPV	\$-197.70
10 year NPV	\$19.58
15 year NPV	\$189.82
Break Even Year	10

Cokeville Example

- Before
 - 380 acres flood irrigated for total yield of grass/alfalfa hay mix of 395 ton or 1.04 ton/acre
- After
 - Two pivots 250 acre and 65 acre total 315 acre
 - 80 fewer acres irrigated
 - Pumping cost is \$4.28/acre
 - Electric pump
- 2002-2004 Average Production
 - Total yield = 800 ton or 2.54 ton/acre
 - Harvested a little over one AUM per acre of aftermath grazing

Cost Assumptions

- Investment Cost
 - Pivot + Establishment - \$950/acre
- Annual Costs
 - Pumping Cost - \$5/acre
 - Additional Harvest Cost - \$20/acre
 - Additional Fertilizer – None (Fertigation)
 - Operation and Maintenance - \$40/acre
- Total Annual Costs - \$65/acre

Return Assumptions

- Annual Returns
 - 1.1 tons/acre @ \$110/ton
 - .5 AUM/Acre Grazing @ \$17/AUM
- Total Returns
 - \$129.50/acre



NPV Tool

Standard NPV Econo Range Instructions Resources

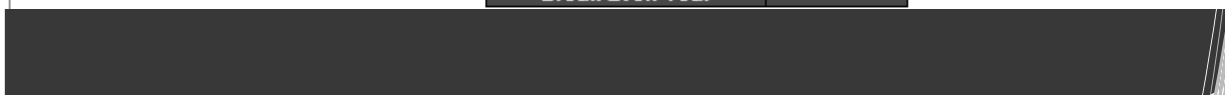
Wyoming Master Stockman Net Present Value Analysis

Investment 950.00
Interest Rate 5%

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Annual Cost	65.00	65.00	65.00	65.00	65.00	65.00	65.00	
Annual Revenue	129.50	129.50	129.50	129.50	129.50	129.50	129.50	
	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Annual Cost	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00
Annual Revenue	129.50	129.50	129.50	129.50	129.50	129.50	129.50	129.50

Results

5 year NPV	\$-656.79
10 year NPV	\$-427.05
15 year NPV	\$-247.04
Break Even Year	None



NPV Tool

Standard NPV Econo Range Instructions Resources

Wyoming Master Stockman Net Present Value Analysis

Investment 475.00
Interest Rate 5%

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Annual Cost	65.00	65.00	65.00	65.00	65.00	65.00	65.00	
Annual Revenue	129.50	129.50	129.50	129.50	129.50	129.50	129.50	
	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Annual Cost	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00
Annual Revenue	129.50	129.50	129.50	129.50	129.50	129.50	129.50	129.50

Results

5 year NPV	\$-181.79
10 year NPV	\$47.95
15 year NPV	\$227.96
Break Even Year	9



**Master Stockman Ranch
Management Institute**
W Y O M I N G

Questions?