MICHIGAN STATE UNIVERSITY | Extension

Feedlot Enterprise Economics

Melissa McKendree
Agricultural, Food, and Resource Economics
Michigan State University

2019 Great Lakes Professional Cattle Feeding and Marketing Shortcourse

February 5-7, 2019

Game Plan

- What is an **enterprise budget**?
- What is **opportunity cost** and how does this relate to economic profitability?
- What are your costs?
- Work through an example enterprise budget.
- How **sensitive** is profitability to changes in different prices or costs?

Enterprise Budget

- ***Definition*:** An organization of revenue, expenses, and economic profit for a single enterprise that is <u>forward looking</u>, based on historical information and future expectations

- Each crop or livestock type that can be grown is an enterprise
  - Examples: corn, feedlot, beef cows, apples

- Usually 1 year for crops, for feedlots how long animal is in lot

Enterprise Budget

- Purpose:
  - To estimate costs, returns and ultimately profits
  - Can be used for partial budgeting and decision-making

- Note: you can have multiple enterprise budgets for one enterprise (different levels of production, technology, different placement weights)

Opportunity Cost

- Economic concept
- **Definition:**

1. The income that could have been earned by selling or renting the input to someone else

OR

2. The additional income that would have been received if the input had been used in the most profitable alternative use

OR

3. Represents the benefits an individual, investor or business misses out on when choosing one alternative over another

What are the opportunity costs?

- The time you are spending at shortcourse?
  - The time with your family, watching TV, relaxing, working
- Money invested in land?
  - Return money would earn invested in next best market
- Labor and management used on a farm?
  - What that labor and management could earn in another job

Accounting vs Economic Profit

- Accounting profit: revenue remaining to pay management, labor and equity capital after paying operating and ownership expenses
  - Only takes $ that changes hands into account (explicit costs)
  - Accounting profit= revenue – explicit costs

- Economic profit: revenue remaining after all production inputs were compensated at their opportunity cost
  - Economic profit= revenue – explicit costs – opportunity costs
  - Goal of enterprise budgets!!!

Traditional Enterprise Budget Layout

Revenue	$/head	OR	$/acre
Variable or Operating Costs	$/head	OR	$/acre
Fixed or Ownership Costs	$/head	OR	$/acre
Estimated profit or income	$/head	OR	$/acre

Revenue

- All cash and noncash revenue from the enterprise

- Some enterprises have multiple sources of revenue
  - **Example:** Dairy has milk, calves and cull cows; Oats has oat grain and straw

- Both yield/performance and price estimates must be realistic and accurate

Operating, Variable, or Direct Costs

- Costs that will be incurred only if the commodity is produced
  - Will be $0 if the commodity is not produced
- **Examples:** feed; fuel and oil; hourly labor

- Expected prices can come from input suppliers
- Expected volumes and quantities of inputs used can come from past farm records

Fixed, ownership or indirect costs

- Costs that would exist even if the specific commodity was **not** grown

- Costs incurred due to ownership of machinery, equipment, buildings/facilities and land used in production

- **Examples**: depreciation, interest, taxes, insurance, overhead

Estimated returns

- Total Revenue – Total Expenses = Profit or Income

- The profit is the return to any unpaid factors plus the net gain

Income or Profit

- CAUTION!
  - What does the profit or income reported mean?
  - What costs are considered?
    - If opportunity costs are considered, then economic profit
    - If opportunity costs are NOT considered, then accounting profit or returns to unpaid labor, management and land

Income over variable costs

- $Income\ over\ variable\ costs =$
$$Revenue\ -\ Variable\ Costs$$

- Aka. Returns To Fixed Costs = RTFC

- How much will this unit (acre or head) of the enterprise contribute towards payment of fixed cost

- OR How much revenue could decrease before this enterprise could no longer cover VC

Feedlot enterprise budget layout

Gross Margin

Gross revenue

Purchase costs

Death loss

Operating and yardage costs

Feed costs

Yardage and other costs (includes fixed & variable costs)

Interest costs

INCOME OVER VARIABLE COSTS

INCOME OVER TOTAL COSTS

Other Examples of Enterprise Budgets

- Kansas State University - Ag Manager
  - https://www.agmanager.info/farm-management-guides-0
- Iowa State- Livestock
  - https://www.extension.iastate.edu/agdm/livestock/html/b1-21.html

Yardage

- Includes fixed and variable costs
  - Also includes opportunity costs like unpaid labor and unpaid management

- Per head per day yardage costs from University of Wisconsin Yardage Calculator
  - https://fyi.extension.wisc.edu/wbic/files/2015/08/UW-Extension-Holstein-Steer-Finishing-Yardage-summary-final.pdf
  - $0.96/head/day

Break-Even Analysis

- Enterprise budgets can be used to calculate either a break-even purchase price or sale price

- **Break-even purchase price** is the price you could purchase feeder steer at given the expected sales price and other anticipated costs.
  - If feeder steer price is higher than breakeven, negative profit
  - If feeder steer price is lower then breakeven, positive profit

- **Break-even sales price** is the output price needed just to cover all costs at a given output level and price paid for the feeder
  - If fed steer price is higher than breakeven, positive profit
  - If fed steer price is lower then breakeven, negative profit

Sensitivity Analysis

- You can use the sensitivity section of the spreadsheet to answer these questions:
  - How does my profitability change if expected fed steer price increases by X%?
  - How does my profitability change if feed costs increase by X%?
  - How does my profitability change if yardage costs increase by X%?
  - How does my profitability change if my feed/gain ratio increases by X%?

- Alternatively you can also change assumptions and save the excel file under different names

Sensitivity analysis

		Beef Steers		Holstein Steers	
		600~1375	800~1425	450~1400	900~1500
	BASE PROFIT	**-$19.51**	**-$80.75**	**$23.16**	**$113.47**
Increase by 5%	New Profit	-$61.98	-$132.10	$1.30	$77.77
Purchase price	Change	-$42.47	-$51.35	-$21.86	-$35.70
	Percent change	-217.69%	-63.59%	-94.38%	-31.47%
Increase by 5%	New Profit	$60.24	$0.47	$95.26	$189.22
Sales price	Change	$79.75	$81.23	$72.10	$75.75
	Percent change	408.81%	100.58%	311.33%	66.76%
Increase by 5%	New Profit	-$41.88	-$101.38	$5.15	$92.02
Finisher feed price (DM basis)	Change	-$22.38	-$20.63	-$18.00	-$21.45
	Percent change	-114.70%	-25.54%	-77.74%	-18.90%

Summary

- Enterprise budgets help project expected ECONOMIC profit for a single enterprise
- Economic profit accounts for opportunity costs
- Enterprise budgets can be used for breakeven analysis
- Important to conduct sensitivity analysis under different scenarios

Thank you!

Dr. Melissa McKendree

mckend14@msu.edu

@ItsMelMac