Business Management Curriculum

Module 4: Financial Analysis

Project Team:

- Ruby Ward, Professor, Utah State University
- Trent Teegerstrom, Associate Director of Tribal Extension, University of Arizona
- Karli Salisbury, Research Associate, Utah State University
- Kynda Curtis, Professor, Utah State University
- Staci Emm, Extension Educator and Professor, University of Nevada Reno
- Carol Bishop, Extension Educator and Associate Professor, University of Nevada Reno

University of Nevada Cooperative Extension

EXTENSION
UtahStateUniversity

THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE & LIFE SCIENCES
Cooperative Extension
Tribal Extension Programs

USDA United States Department of Agriculture

National Institute of Food and Agriculture

WESTERN SARE Sustainable Agriculture Research & Education

Each university is an affirmative action/equal opportunity

Acknowledgments: Vicki Hebb, reviewing content, and Russ Tronstad (University of Arizona) and Stuart T. Nakamoto (University of Hawaii) , content.

This material is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2013-38640-22175 through the Western Sustainable Agriculture Research and Education program under subaward number EW14-017. USDA is an equal opportunity employer and service provider. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Teaching Notes:
This module uses the help of class handouts to explain how to stay on top of financial well-being and maintain a well-rounded business. Profit is used to gauge your level of standing with regard to your competitors or your industry as a whole. Keep in mind that the key to being profitable is to increase your volume, maintain high efficiency, and change your product mix. These strategies allow you to stay current and competitive in business or in your everyday financial life. The break-even point is the point at which your expenses and your income total zero. Above this point you are making a profit; below this point you are losing income. The break-even point is critical to understanding how much you must make to have a profitable or non-profitable business idea. To make changes to your business you must keep track of your decisions. Use the example of a partial budget, which allows you to look at potential changes to be implemented and whether they will have a negative or positive impact.

Educational Objectives:

1. Analyze whether a business is profitable
2. What needs to be done to increase your profit?
3. Point of a break-even analysis
4. Benefits of partial budgeting

Discussion Topics

1. What are some steps that can be taken to increase volume in the profit equation?
2. How does one become more efficient?
3. What determines sensitivity?
4. Why is it important to understand your break-even point?
5. What are you determining when you build a partial budget?

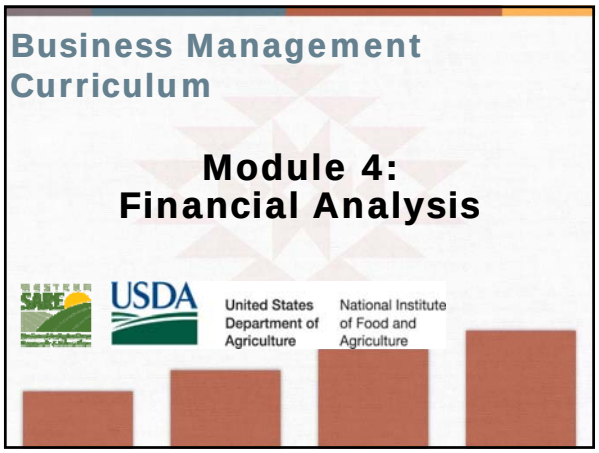
Available Materials:

1. PowerPoint Presentation (1) – can be printed and used as a handout
2. Worksheets (5) – can be provided as homework or completed in a workshop if time allows.
    a. Risk analysis - This worksheet explains how a small increase or decrease in price, expenses, and/or interest rates will impact a business. Here you are trying to weigh how your choices will change an aspect of your business.
    b. Partial budget (REQUIRES EXCEL) - The first partial budget in this module looks at what a normal operation may face when they start to do their own budget. Then there is a breakdown of what the numbers that were calculated mean to the overall success of the partial budget. There is an example slide as well as an empty sheet that the students can complete.
    c. Enterprise break-even analysis – Using this worksheet, students can try different combination of volumes and price points to examine how they affect the break-even point of their operation. The key here is to make sure that they are staying above the price that the market demands; otherwise their business will run at a deficit. Remind students to stay within their production capacity as they fill out this worksheet.
    d. Sensitivity analysis (REQUIRES EXCEL) - This worksheet demonstrates how even simple changes can have large impacts on their operation. This worksheet helps students understand how income will change positively or negatively depending on how the business changes.

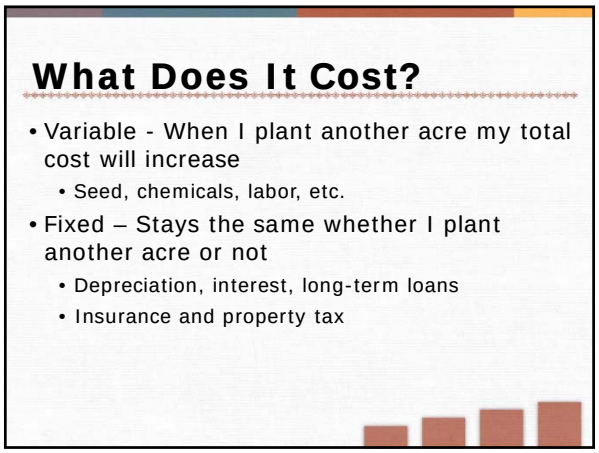
e. Partial budget form with examples (REQUIRES EXCEL) - This worksheet gives students a glimpse of what needs to be done to complete a partial budget for two different types of farms: cantaloupe and corn maze. Using two examples for this worksheet allows students to explore the different costs associated with running operations that appear to be very similar in nature.

Outline:

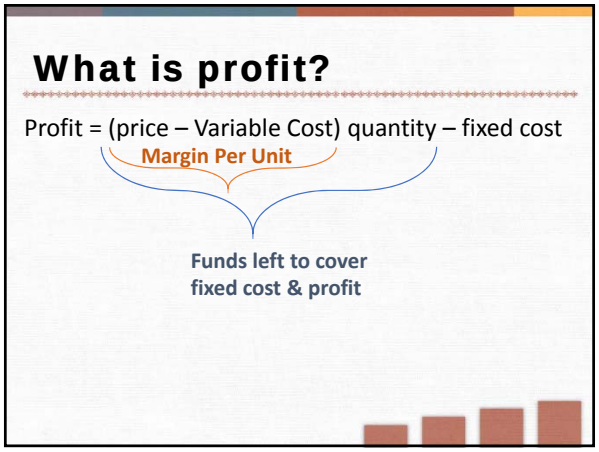
1. Objectives
2. What does it cost?
    a. Variable costs
    b. Fixed costs
3. Profit formula
    a. Increase volume
    b. Become more efficient
    c. Change your product mix
4. Re-Introduction of MyFi
    a. What can my business afford?
    b. Buying a truck example
5. How do you become wealthy?
6. Sensitivity analysis
    a. How sensitive are you?
    b. Ranch operation example
7. Break even analysis
    a. Break-even analysis equations
    b. Tomato budget example
    c. Ranch budget example
    d. Hire out custom work
8. Partial budgeting
    a. Evaluate a change in the business operation
    b. Partial budgets require minimal information
    c. Example of a tomato partial budget
9. Questions?
10. Thank you



Slide 3: This module is to show how to use all the information from the other modules to understand how it affects profit and how to create strategies and analyze ideas.

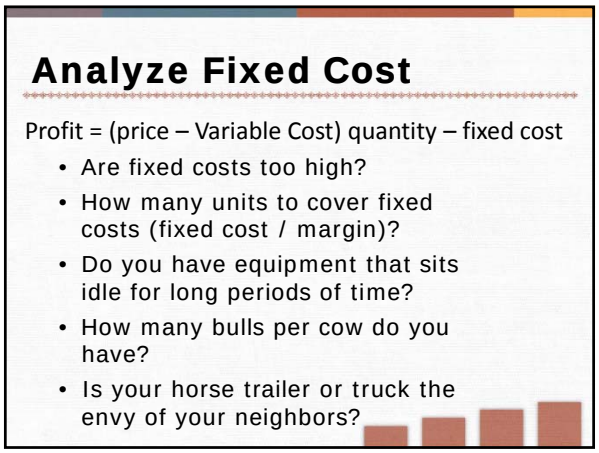


Slide 4: This was defined in earlier modules, but it here to make sure everyone is together.

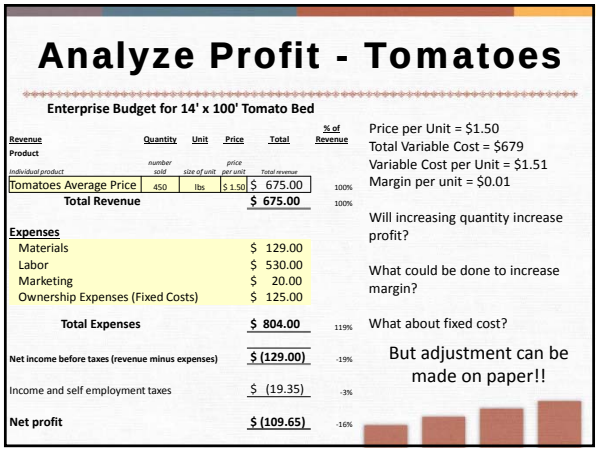


Slide 5: Without getting into numbers, it can be helpful to understand what profit is and how it is calculated. This breaks it down and shows how we can begin analyzing our profit. The first step is to understand margin and what you are making per unit. Then look at fixed costs. The next slides will talk about this and then enterprise budgets are used as examples.

Slide 6: This is important. If there is zero or negative margin per unit, doing more of the same thing will not increase profit. They must first figure out how to increase the margin per unit. These questions are designed to see if someone has a low margin. If they do, they will then need to look at how to increase the price or lower costs.



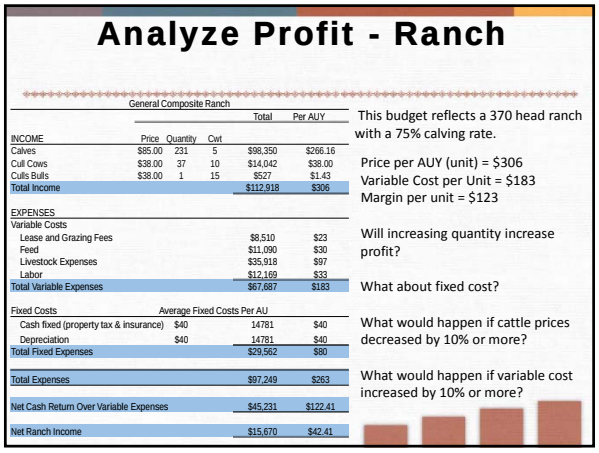
Slide 7: This slide shows how to look at fixed costs. Sometimes an enterprise has good margin, but simply too many fixed costs to be profitable. An example is too much money in equipment for the size of the operation. If someone grows 100 acres of wheat, they cannot afford to have a $400,000 grain harvester. They will need to look at either making more money from the grain harvester (custom work); have a used cheaper harvester, or hire someone else to harvest the wheat and not have the equipment at all. Cattle can also have excessive fixed costs. A $70,000 truck for a few cows will not work. The more money in equipment, the lower the profit.



Slide 8: In this example, the margin is very low all but zero. When margins are low, increasing volume will not increase profit. Look at ways to increase price or lowering costs. Increasing price could be done by selling into markets with a higher per unit price (i.e. a farmers market or chefs that may pay $4-5 per pound). Labor costs seem to be really high and ways of managing and lowering labor could be sought. Lowering labor costs would decrease variable costs and increase the margin.

If margin cannot be improved, this enterprise should be re-evaluated.

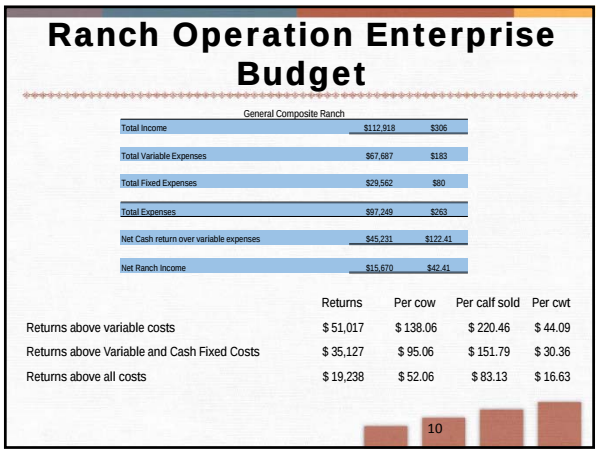
In this case the problems with margin are very apparent. However, there may still be issues or room to improve fixed costs too.



Slide 9: In this example, the margin seem okay. Returns above variable cost and total costs are both positive. There is enough return over variable cost to cover the fixed and have a profit.

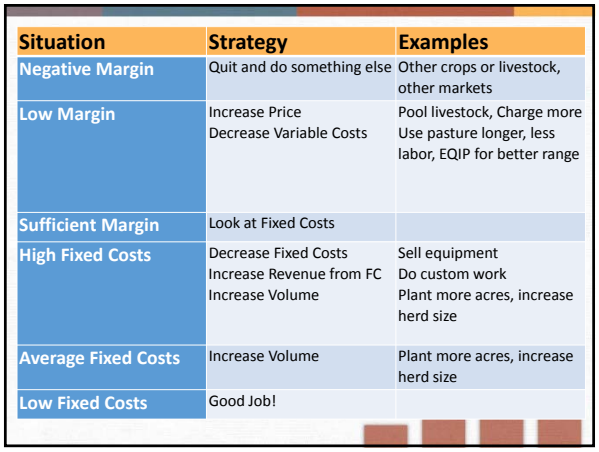
However, if the price drops by 14% or variable costs increase by 23% there will be no profit. This situation looks profitable, but could still have room to improve. Discussing how various decisions could affect profit. One question could be if increasing nutrition with supplements and extra feed to increase calf weight would increase profit. The reality is "it depends". If the extra supplement and feed cost more than we get from the increased returns it would not.

It would be good here to talk about strategies to lower fixed cost, such as selling equipment that is not needed, or maybe using equipment for custom hire to generate additional revenue. Also ways to lower variable cost such as using pasture or fencing fall fields.



Slide 10: This just illustrates the different ways to calculate and define your per unit cost. Either method will work, but be consistent in your method. The best method is however they think.

Slide 11: This summarizes the various situations that could arise in analyzing profit. It also shows the potential strategies and examples. Only a few examples are listed here. You could use examples from participants and let them discuss examples that could be used for the various strategies. Some general strategies are listed below.



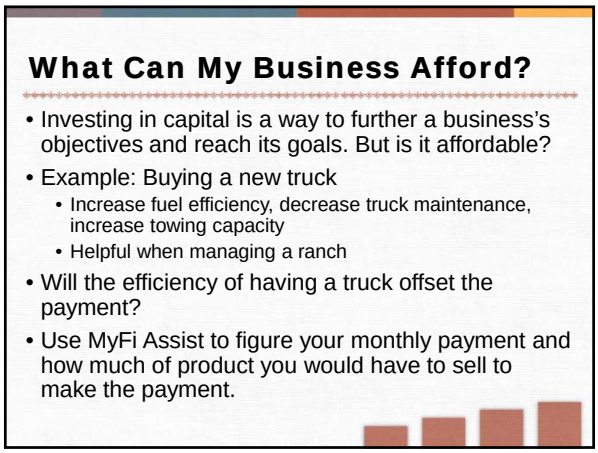
Situation	Strategy	Examples
Negative Margin	Quit and do something else	Other crops or livestock, other markets
Low Margin	Increase Price Decrease Variable Costs	Pool livestock, Charge more Use pasture longer, less labor, EQIP for better range
Sufficient Margin	Look at Fixed Costs	
High Fixed Costs	Decrease Fixed Costs Increase Revenue from FC Increase Volume	Sell equipment Do custom work Plant more acres, increase herd size
Average Fixed Costs	Increase Volume	Plant more acres, increase herd size
Low Fixed Costs	Good Job!	

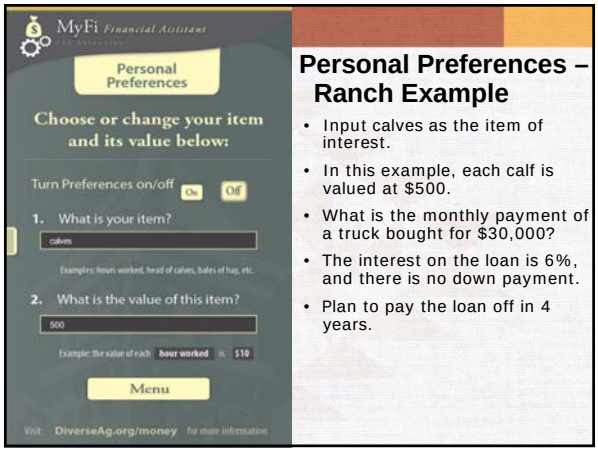
Potential strategies for increasing volume: 1) sell more to the same customers, 2) sell to more customers, 3) plant more acres, 4) have more head of cattle, 5) lease more ground.

Become more efficient strategies: 1) decrease cost per unit either lower variable cost per unit, or lower fixed cost per unit by increasing volume, or 2) increase yield or productivity (i.e. healthier calves, higher calving rate, fewer open cows)

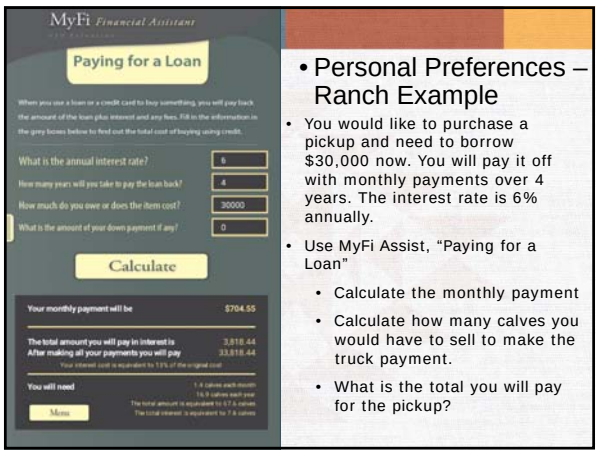
Change product mix: 1) some enterprises/products are more profitable, 2) focus more effort on more profitable enterprises. One example is a small grower in North Carolina. She grew petunias and pansies because Walmart was doing it down the street. However, it cost more for her to grow them than Walmart was selling them for. She also grew specialty plants that people drove hours to purchase. They were buying them for a $100 in some cases. She could sell more specialty plants if she had time and space to grow them. So for her changing the product mix and not doing pansies and petunias just because others were doing it.

Slide 12: The MyFi Assist was first introduced in the Money Management modules: a guide to personal finances. MyFi Assist will be used in examples of partial budgets.

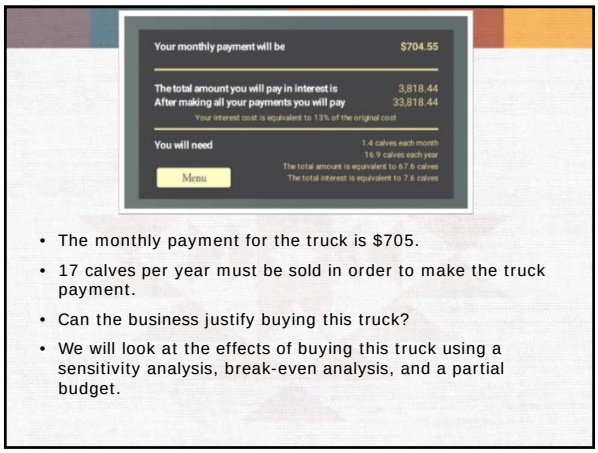




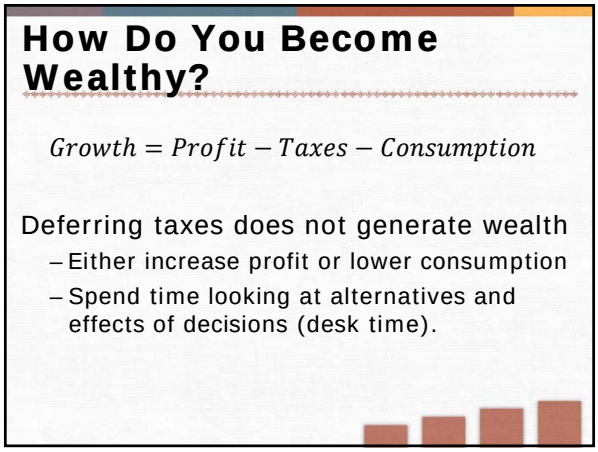
Slide 14: This is a very generic example. Other examples can be used. The $30,000 borrowed could also be fencing and corrals, equipment, etc.



Sldie 15: The total payments each year could be used in an enterprise budget as the cost of the equipment. Being able to think about this in terms of what they are selling can help them know if they should buy something. In this example, what will the pickup provide to make it worth 17 calves? Would they rather have 17 calves or the pickup?

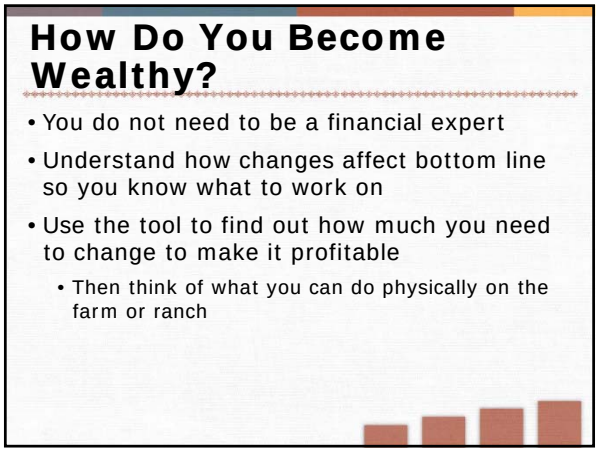


Slide 16: They can also think about can they justify using 17 calves each year to pay for the truck? They will now have to have that may extra to have the same profit.

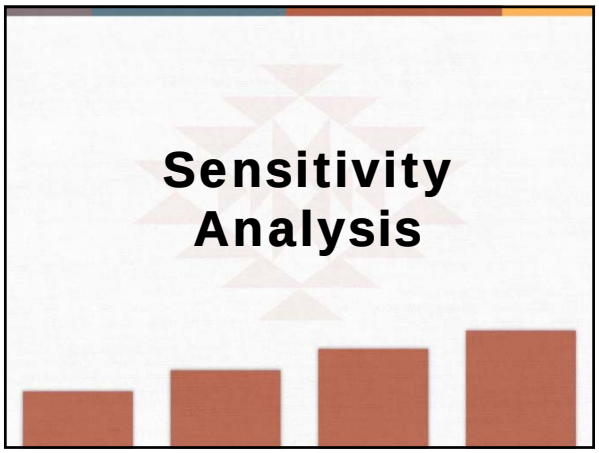


Slide 17: Profit is not wealth. Profit is what is made each year. If you work for someone as a job, the whole profit after taxes can be used as consumption. In a business, often profit must be kept in the business and not taken out for consumption or family living. That increases wealth. Sometimes people think deferring taxes increases wealth. If profits are zero taxes is zero, but there is no growth (increase in wealth).

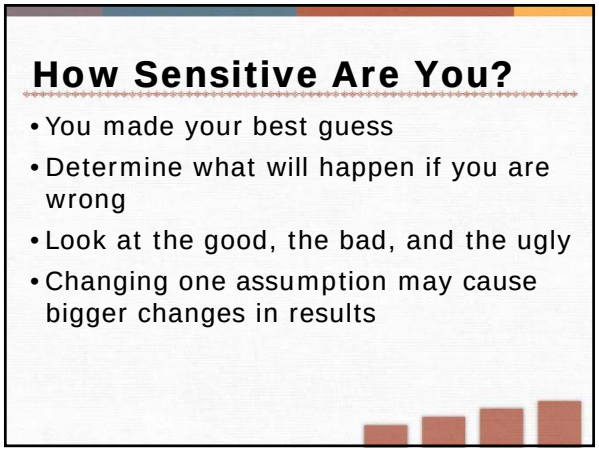
To increase growth (change in wealth) look at ways to increase profit without increasing consumption.



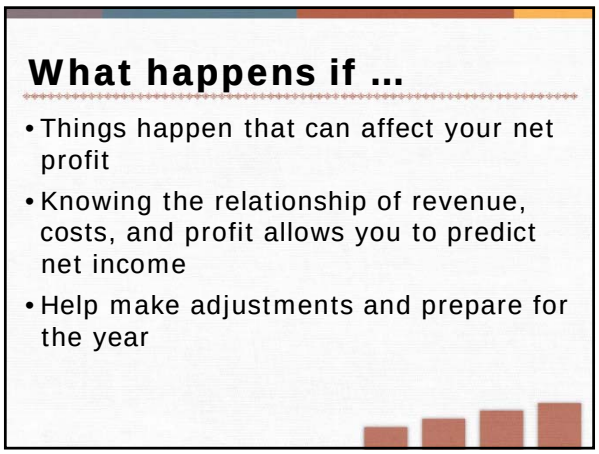
Slide 18: The next areas show how to use specific tools to analyze decisions and risk.

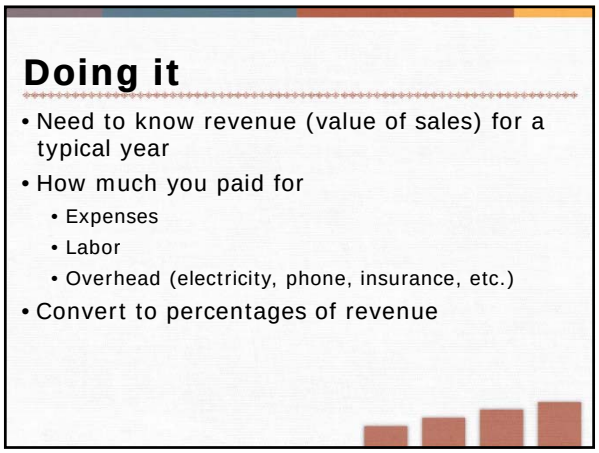


Slide 19: Sensitivity analysis is one way of understanding risk. You look at what happens if something changes.

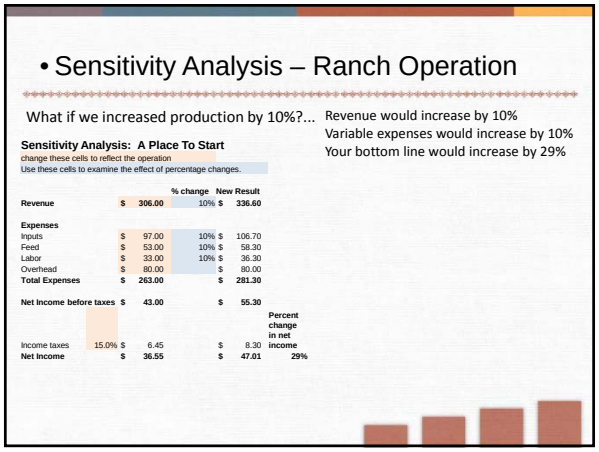


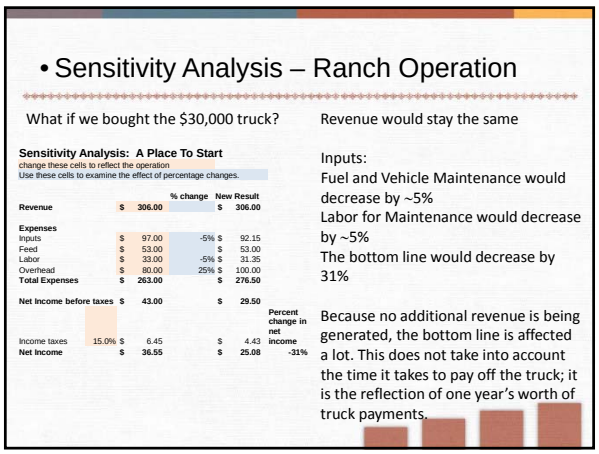
Slide 20: These next two slides show why we do sensitivity analysis.





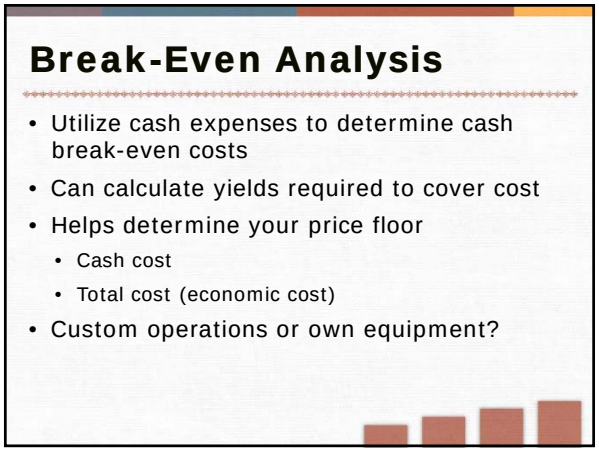
Slide 22: There is an Excel file that has the example used in the following. You can use the Excel file to look at participants situation.



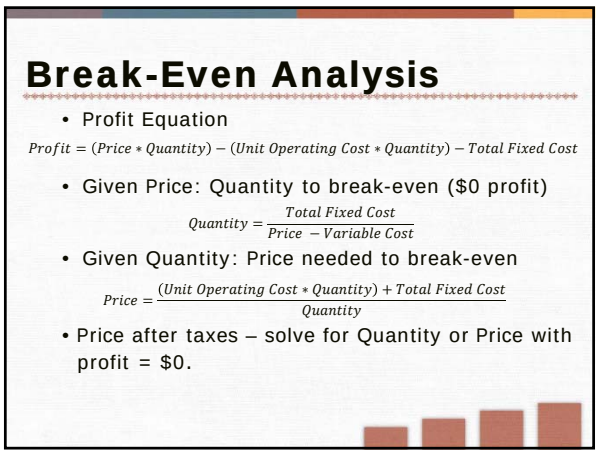


Slide 24: We know the truck payment, so we can use that to see what percent of overhead it would be. Then look at what might decrease for inputs and labor. We did some very basic examples here. This is better to use the Excel file and look at situations live. Look at a small change in price/revenue or a drop or increase in yield. Its also good to look at some combinations or changes that need to be made to get profit to increase by the desired percent. Often a few small changes can make the difference. In the ranch operation, maybe having a slightly heavier calf with some extra feed, but less feed is used because you are able to graze some fall fields.

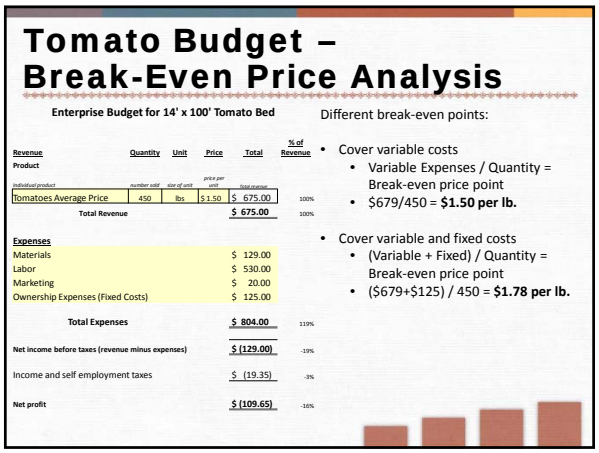
Slide 25: This is another analytic tool. Here it is understanding what is your breakeven, price to quantity to either just break-even (zero profit) or to meet a profit goal.



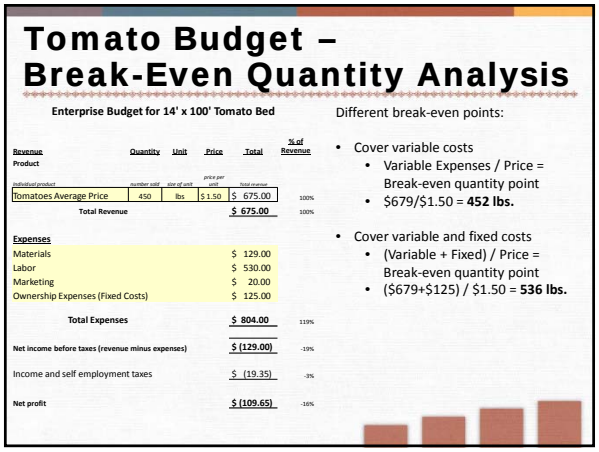
Slide 26: This is similar to what we were doing in the profit and margin analysis above. This just provides formulas and more specific ways of looking at it. It's important to understand your breakeven and know that there are multiple ways of looking at break even. You will see that in the next slides.

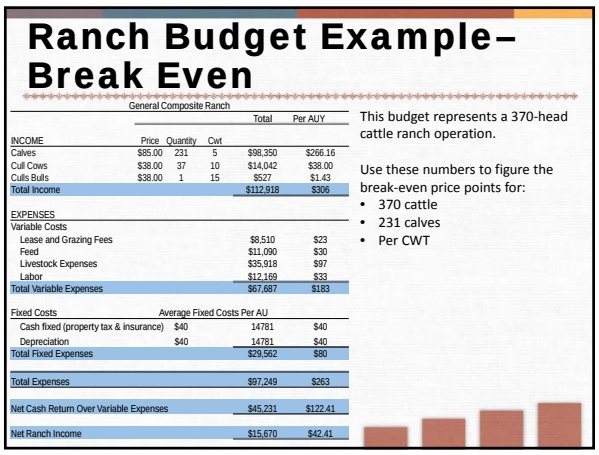


Slide 27: Another way to display the break even price is price = unit operating cost + Fixed cost/quantity.



Slide 28: Use the tomato budget in Excel to show the different break-even terms.





Slide 30: Use Ranch budgets to show and discuss break even

Ranch Budget
Break-Even Analysis Examples

Costs		Breakeven Per cow	Breakeven Per calf	Breakeven Per CWT
Variable Costs	$67,687	$ 183.18	$ 292.50	$ 58.50
Variable Costs & Cash Fixed Costs	$83,577	$ 226.18	$ 361.16	$ 72.23
All Costs (cash and non-cash)	$99,466	$ 269.18	$ 429.82	$ 85.96

What if we added the $30,000 truck?

Costs		Breakeven Per cow	Breakeven Per calf	Breakeven Per CWT
Variable Costs	$64,872	$ 175.56	$ 280.33	$ 56.07
Variable Costs & Cash Fixed Costs	$87,043	$ 235.56	$ 376.14	$ 75.23
All Costs (cash and non-cash)	$109,215	$ 295.56	$ 471.95	$ 94.39

- The break-even price to cover the variable costs went down because of a decrease in the variable inputs like fuel and maintenance.
- The decrease in the variable costs did not off-set the increase in the fixed expenses, therefore the break-even price point increased when we include all costs.

Break-Even Acres for Equipment

$$Break-even\ acreage = \frac{Annual\ Ownership\ Costs}{Custom\ Rates - Operating\ Costs\ Per\ Acre}$$

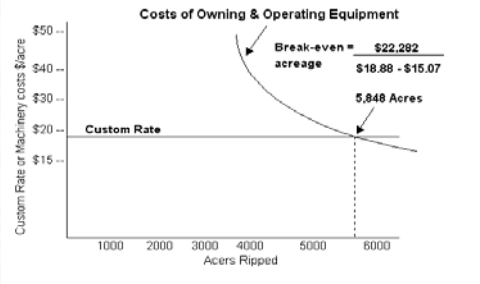
Annual Ownership Costs: Annual; depreciation, interest, taxes, insurance, and housing

Custom Rate per Acre: Rate charged per acre

Operating Costs per Acre: Fuel, maintenance, labor, and other inputs

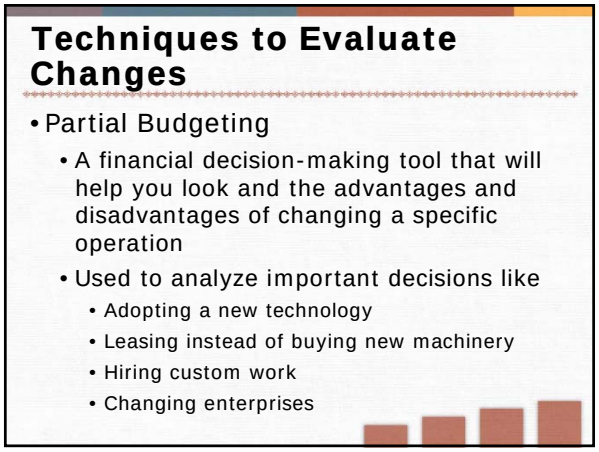
Slide 32: Producers are often faced with the decision of should I buy a piece of equipment or should I have the operation done by a custom operations? For example, should I buy a grain combine or they hire a customer harvest operation to do it. In this example the annual ownership costs including the payment and any annual insurance or taxes. The rate charged per acre by the custom harvesting operation would be the custom rate.

Break-Even Acres Self vs. Custom

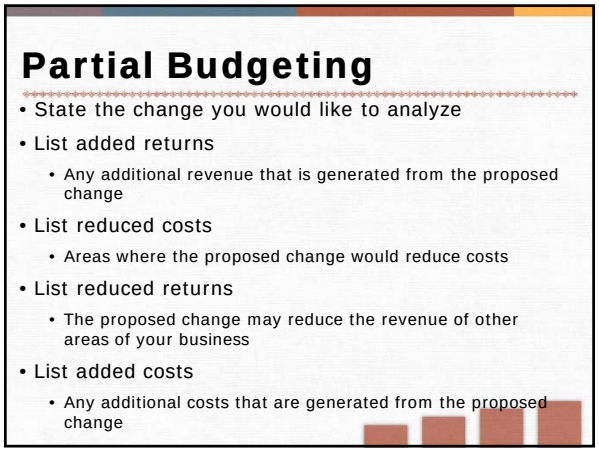


Slide 33: In this example, The owner would have to work 5,848 acres annually in order to break even with owning their own equipment vs using a custom operation at $18.88 per acre. However another consideration that needs to be considered is the timing and availability of the custom operation. Sometimes losses can be incurred due to delayed harvesting, weed control, insect control, planting etc.

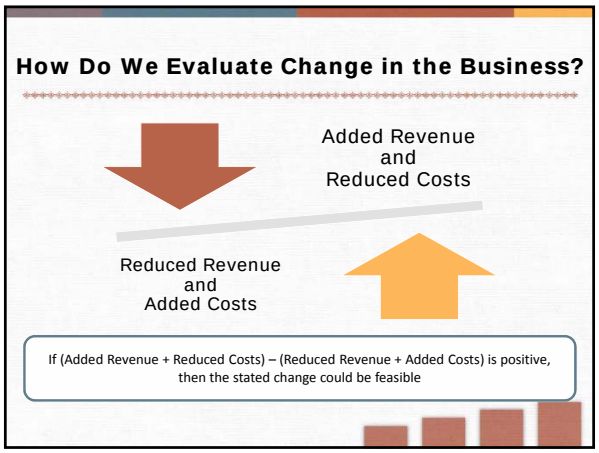
Slide 34: This is a good tool to look at changes that only affect some items. For example, planting corn instead of wheat.



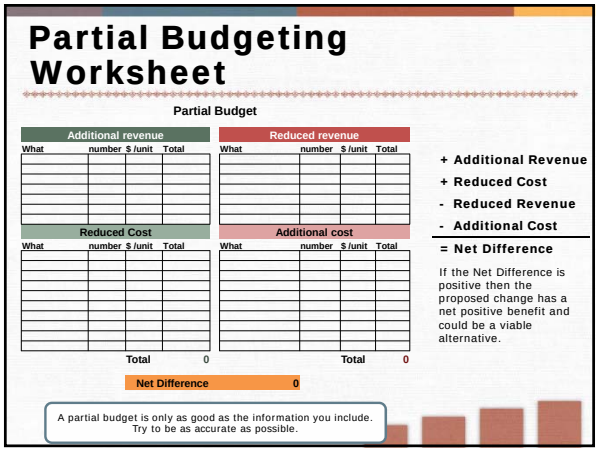
Slide 35: Unlike an enterprise budget that needs all revenue and expenses for one thing, a partial budget only needs the information about what will change. However, the information is needed for both what is currently done, and what is being considered.



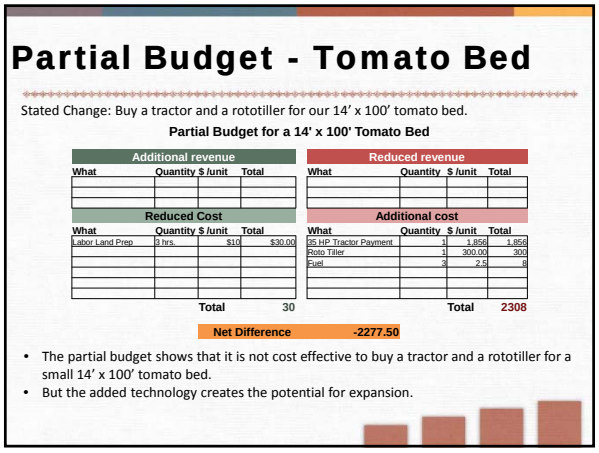
Slide 36: This is the information needed.



Slide 37: Overall, this is how a decision is made with a partial budget. Do the good things outweigh the bad?

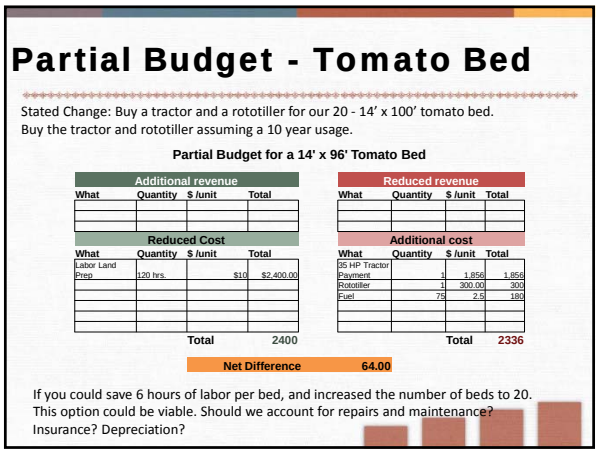


Slide 38: There is an Excel template to use.



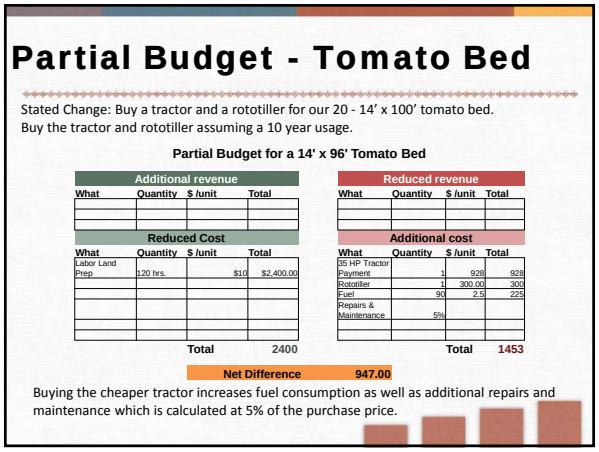
Slide 39: Should you buy a tractor and rototiller for $8,000. It will reduce labor. This slide shows the effects of buying it for the tomato enterprise budget. The next slide shows a larger operation.
Use MyFi Assist to calculate the payment. Use paying for a loan. The interest rate is 6%, for 5 years, $8,000 cost with $0 down payment. The monthly payment is $154.66. Multiply by 12 to get annual payment of $1,855.92.

This would be a great case to show excessive fixed costs. Do not buy the equipment.



Slide 40: This is for 20 -14'x20' tomato beds and 6 hours of labor per bed. The tractor and rototiller are the same price as before. Notice that the price of fuel went up to account for the additional beds.
One thing that isn't accounted for is repairs and maintenance in this partial budget, if $64 is not enough for cover repairs then this is not a viable option.

Additional cost that could be incurred can be both variable and fixed. Items like fuel, repairs, taxes, insurance, storage space should be thought about.



Slide 41: This is for 20 -14'x20' tomato beds and 6 hours of labor per bed. The instead of buying an $8,000 tractor, we will purchase a $4,000 tractor (We used 6% interest, and 5 year pay back). The rototiller is the same price as before. Because the tractor is assumed to be used, we will account for more fuel and higher repairs and maintenance.

Partial budgets can be a flexible way to look at the different assumptions, going through all of the scenarios can help build a better picture of the risks and impacts involved in starting a new enterprise.

Thank You!

Use the space below to record and compare the results of a 5% decrease in market prices, a 5% increase in expenses, and a 2% increase in interest rates for each strategy alternative. You will need to use software or another sheet of paper to calculate the effect of these very real market uncertainties. How do these market- and finance-related shocks affect your present business and its future under the strategy alternatives that you are considering?

	Base Plan	Strategy #1	Strategy #2
Effect of a 5% decrease in price			
Net income	_____	_____	_____
Net cash flow	_____	_____	_____
Effect of a 5% increase in expenses			
Net income	_____	_____	_____
Net cash flow	_____	_____	_____
Effect of a 3% increase in interest rates			
Net income	_____	_____	_____
Net cash flow	_____	_____	_____

Calculate the break-even value or volume for each enterprise or product. Try experimenting with a range of market prices to see how they affect your break-even volume. Is your break-even value below or above the projected market price you identified?

Break-Even Volume Enterprise or Product: _____

Annual overhead costs (a) _____

Direct costs/unit (b) _____

Estimated market value/unit (c) _____

Break-even value (a+b)/(c) _____

Estimated sales volume _____

Upper limit or output capacity _____

How does your break-even volume for this product compare to your projected sales volume and production capacity estimates? Can you break even?

_____
_____
_____
_____
_____

Break-Even Volume Enterprise or Product: _____

Annual overhead costs (a) _____

Direct costs/unit (b) _____

Estimated market value/unit (c) _____

Break-even value (a+b)/(c) _____

Estimated sales volume _____

Upper limit or output capacity _____

How does your break-even volume for this product compare to your projected sales volume and production capacity estimates? Can you break even?

_____
_____
_____
_____
_____
_____