Grazing Economics 101

"Keys to Being a Profitable Forage Producer"

MODNR-SWCP
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Mostly stolen from

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University of Missouri Extension Specialist
and Cow-Calf Producer

Profitability?

- Is it only a myth in the cow-calf industry?
- What do you think the average cow-calf producer makes per cow per year?
- But what is “average?” And WHO want to be “average?”

Key Economic Factors in Cow/Calf Enterprises

- Reproductive Efficiency
- Weaning Weights
- Sales Price
- **Feed Costs**
- **Depreciation**
- Other Variable Costs
- Fixed Costs

MiG can impact all of the above!

High vs. Low Profit Cow-Calf Producers
(SPA Data IA: 1995-2000)

Return & Cost Factors			
	High 1/4	**Average**	**Low 1/4**
Financial return to capital, labor & mgmt. Per cow	$127.69	-$9.90	-$144.84
Total financial cost per cow	$230.11	$362.87	$461.96
Total financial cost per cwt. produced	$47.32	$72.23	$108.04

High vs. Low Profit Cow-Calf Producers
(SPA Data IA: 1995-2000)

Feed Resource Factors			
	High 1/4	**Average**	**Low 1/4**
Total financial feed cost per cow	$146.05	$195.06	$265.50
Total financial feed cost per cwt. produced	$29.71	$43.80	$63.84
Financial pasture cost per animal unit month	$6.47	$9.22	$12.33
Stored feed fed per cow (dry matter)	3,509 lbs.	3,722 lbs.	4,388 lbs.

High vs. Low Profit Cow-Calf Producers (SPA Data IA: 1995-2000)

Production Factors			
	High 1/4	**Average**	**Low 1/4**
Calves born in first 42 days of calving season	83.4%	83.8%	82.4%
Calf crop weaning percentage	85.7%	83.4%	81.7%
Pounds weaned per exposed female	421 lbs.	401 lbs.	360 lbs.

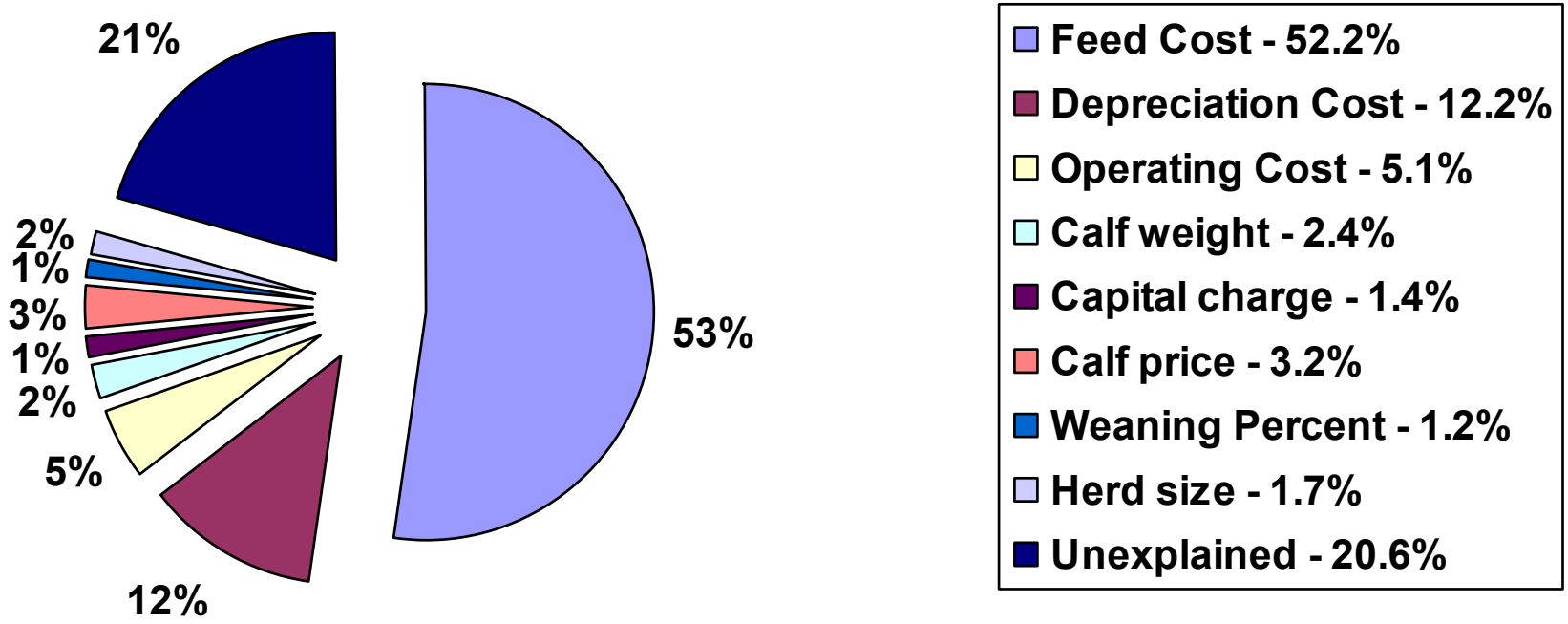
Profitability?

- So there's a difference between top and bottom – It's not just average
- IA & IL study to determine what separated them
  - 4 yrs: 1996-1999
  - Herd size: 20 to 373 cows

Variables In The Equation

- **Cost Variables**
  - Feed Cost
  - Operating Cost
  - Depreciation Cost
  - Capital Charge
  - Hired Labor
  - Family Labor
- **Production Variables**
  - Calf Weight
  - Calf Price
  - Cull Weight
  - Cull Price
  - Weaning Percentage
  - Calving Distribution
- **Other Variables**
  - Herd Size
  - Investment

Variation in Returns to Labor & Management Explained by Economic Variables (1996 - 1999)



Source: 2001 Beef Research Report – Iowa State University

Relative Cost of Supplying a Unit of Energy to Ruminants

- Grazed pasture 100

Relative Cost of Supplying a Unit of Energy to Ruminants

- All Hay 222
  - Equipment & depreciation, fuel & oil, repair & maintenance, labor

Relative Cost of Supplying a Unit of Energy to Ruminants

• Grazed pasture	100
• Alfalfa hay	192
• All hay	222
• Silage	277
• Dehydrated forages	419
• Grains & concentrates	322

Source: Dr. Rob Kallenbach, State Forage Specialist, University of Missouri

Fundamentals of Successful Grazing Management

- Meet the nutritional needs of livestock from standing pasture
- Optimize pasture yield, quality, and persistence

Cow, sheep, goat, or horse can all harvest forages cheaper than you can!

Basic Ingredients to Produce Grass

- Solar Energy
- Water
- Soil Nutrients

Where's your money going?

Fertility Removed by Haying vs. Grazing

	Nutrient Removal (lbs/acre)	
	3 Tons of Hay	Cow/Calf Pairs or Stockers
Nitrogen	150 N	10 N
Phosphorus	18 P (40 lb P_2O_5)	3 P (7 lb P_2O_5)
Potassium	120 K (145 lb K_2O)	0.7 K (1 lb K_2O)

Source: Dr. John A. Lory, Environmental Nutrient Management Specialist, University of Missouri

What's that hay worth, and should you bale it or buy it?

- 1500 lb. bale of fescue hay contains:
- 30 lb. N @ $.60 = $18.00
- 15 lb. P @ $.62 = $9.30
- 38 lb. K @ $.39 = $14.63
- Total fertilizer cost = $41.93
- 75 % of N is lost, so fertility value of the bale of hay is $28.43 (feed value is a bonus)

Grazing Economics 101

- *"Don't Pay More Than You're Going To Get"*
- Resources are not unlimited
  - We have to make choices about where to allocate our resources
  - We should select options that will make us the most money

Management-intensive Grazing

Key point of economic impact
Increased gains per acre

- **Increased forage utilization**
- **Extended grazing season**
- Increased stocking rates
- Potentially greater ADG's

May decrease input costs

- **Stored feed (HAY)**
- Fertilizer
- Weed control costs

Management-intensive Grazing – cont.

Offers greater management flexibility

Comes at an added cost

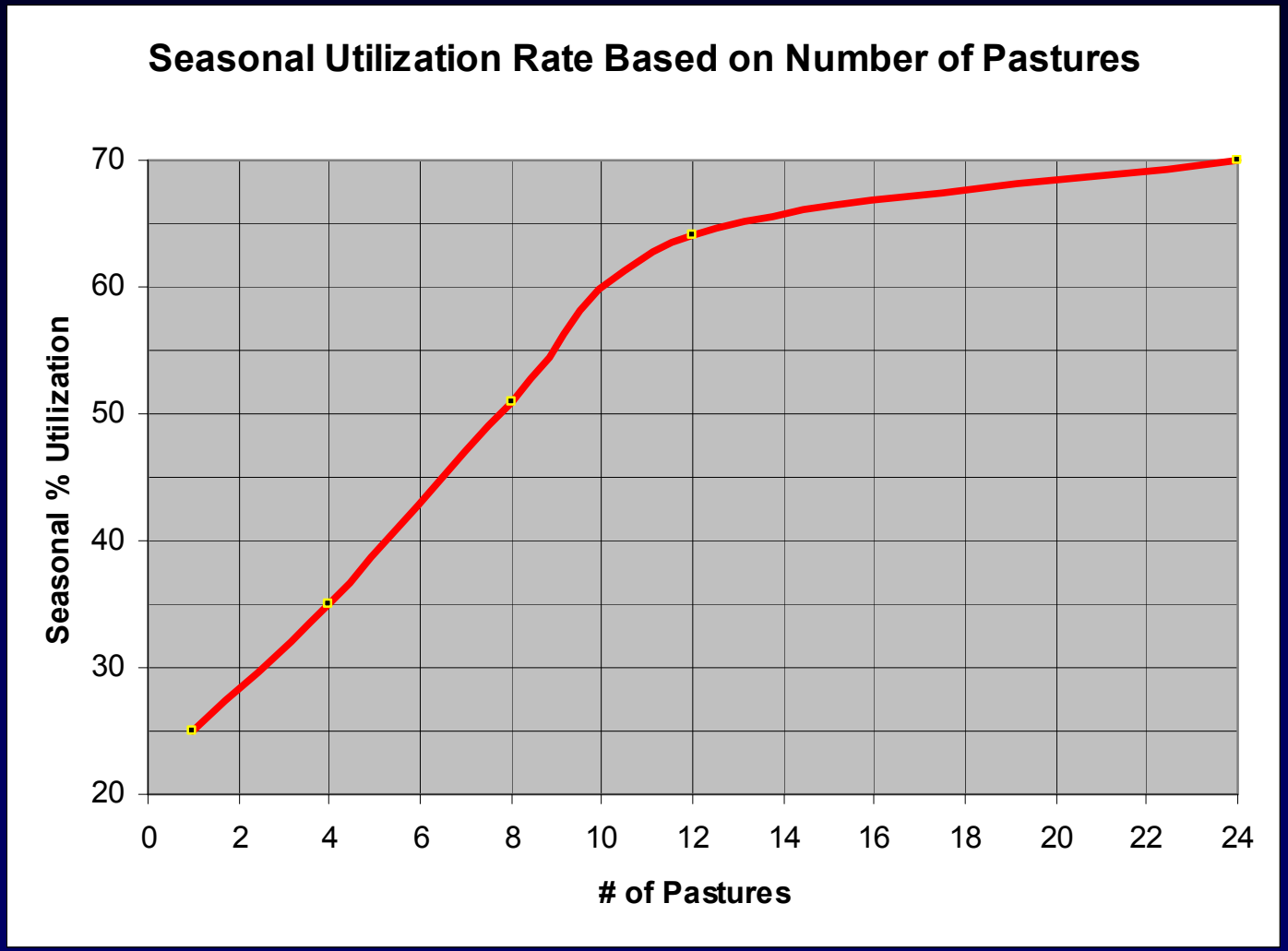
- Fence
- Water System
- **Labor**
- **Higher level of management required**
- Greater animal investment (?)

How many paddocks should a cow-calf grazing system have?

- Based on rest period needs of the forage—not less than 8.
- Based on benefit of increased forage utilization—probably not over 10 – 12.

- Note—it's important to be able to subdivide those paddocks easily to ration forage during dormant/slow-growth periods.

Effect of Paddock Numbers on Seasonal Forage Utilization



M.U. Forage Systems Research Center - Grazing System Data

	3 Paddock	12 Paddock	24 Paddock
Pasture costs/Ac	$24.55	$31.37	$37.87
Direct animal costs	11.30	13.87	17.53
Interest Costs			
$600 cow @ 8 %	$9.17	$ 10.59	$ 13.57
$425 steer @ 8 %	2.87	3.61	4.43
Income over pasture, animal & interest costs	$84.86	$ 115.43	$ 117.74

Can a pasture enterprise compete economically with CRP or grain crops?

Adams Co. (SW) Iowa CRP Project Demonstration Farm

Examined economic competitiveness of grazing systems to cropping and CRP on marginal, highly erodible land

The 13 paddock intensive grazing system with cow/calf pairs was the most profitable option

Less intensive (slow rotation) grazing was the 2nd most profitable system

CRP was third

Only one cropping option gave a positive economic return

Factors that Affect MiG Profitability

- Scale economies
- Enterprise
- Pasture productivity
- Length of grazing season
- Forage species
- Feed budgeting

Scale Economies

Lower development costs per acre as more acres are developed

-Fence corners and gates are more expensive, line is cheap

-Fence material *costs escalate rapidly* as acres in system fall below 80

-Ten 5 acre paddocks will be much more expensive per acre to develop than will ten 25 acre paddocks

Enterprise

Ability of the animals to respond to improved grazing and/or forage management

-Cow/calf sales (i.e. calf gains) are buffered by the cows performance

-Stockers provide a more direct relationship between grazing and gains

-Grazing dairies require and respond to consistently high quality and plentiful forage

Productivity

Inherent productivity of your pastures

-Higher yielding pastures can justify higher development costs per acre

-160 acres divided into 8 paddocks costs the same for pasture yielding 4000 lbs of dry matter forage or 7000 lbs

-Hard to justify the costs of MiG when it takes 30 acres to support a cow/calf pair as opposed to 4 acres per pair

-Level of "intensification" will be related to the level of productivity

Current Resources

- Baseline
  - Soil fertility
  - Water access
  - Forage base
- Productivity: high vs. low quality
  - High quality resources yield a higher marginal return for the same marginal cost *(Required terms)*

"Bang for the Buck"

- Implications for regions, for farms, and for fields
- *Example*
  - Ridge Field A yields 110 cow days/yr
  - Bottom Field B yields 160 cow days/yr
  - Forage utilization is increased 30%
- *Question*
  - Which fields on your farm will pay the most for your investment (Resources?)

Length of grazing season

As with productivity, a longer grazing season provides more days to recover development costs

-160 days in upper Midwest versus 230 days or more as you move south

BUT, can you extend your grazing season? How much?

-Replacing a day on stored feeds with a day of grazing is very cost efficient

Forage species

Ability to establish and maintain improved forage species due to improved grazing management

-Native range versus introduced tame-grass pastures
  -Environment may limit your ability to use improved forage species

-Legume persistence in cool-season pastures
  -Related to grazing management (rest periods)

Stocking Rate Decisions

- **"Management"** Intensive Grazing vs. Intensive Grazing
- Profitability vs. an automatic increase in stocking rate
- Long-term decisions always consider persistence
  - Seed and weed control costs

Stocking Rate

- What is the most profitable stocking rate?
  - A. Max Individual Performance
  - B. Max Total Production Per Acre
  - C. None of the above
- Do market prices matter?

Importance of Gain per Head
(Baseline)

- Value of pasture improvement example
  - 200 lb. Gain @ 1 steer/acre
  - 6.5 cwt @ $68.32 = $444.08
  - 4.5 cwt @ $79.02 = $355.59
    - Gross returns $88.49
  - Non-pasture expenses $52.27
  - Return to pasture & overhead $36.22

Importance of Gain per Head
(MiG Improves Gain)

- 260 lb. gain example
- 7.1 cwt @ $67.05 = $476.06
- 4.5 cwt @ $79.02 = $355.59
  - Gross Returns $120.47
- Non-pasture expenses $53.07
- Return to pasture & overhead $67.40

Importance of Gain per Head
(MiG Improves Profits)

- 30% improvement in gain per head
  - (260 lb. vs. 200 lb.)
- Gives an 86% improvement in profits!
  - ($67.40 vs. $36.22)

Gain per Head vs. Gain per Acre

Baseline

- 1 steer/acre @ 200 lbs gain
  - Profit/acre = $36.22

Option #1 - *Gain per Head*

- 1 steer/acre but increased gain to 260 lbs
  - Profit/acre = $67.40

Option #2 - *Gain per Acre*

- Increase stocking rate stocking rate by 50%
- 1.5 steers/acre @ 200 lbs/acre
- Total Production = 300 lbs/acre
  - Profit/acre =
  - $53.33/acre

Which Is The Most Profitable?

- 1 steer – 200 # - $36.22
- 1 steer – 260 # - $67.40
- 1.5 steers – 300# - $54.33

Gain per Head vs. Gain per Acre

- More total production but less profit

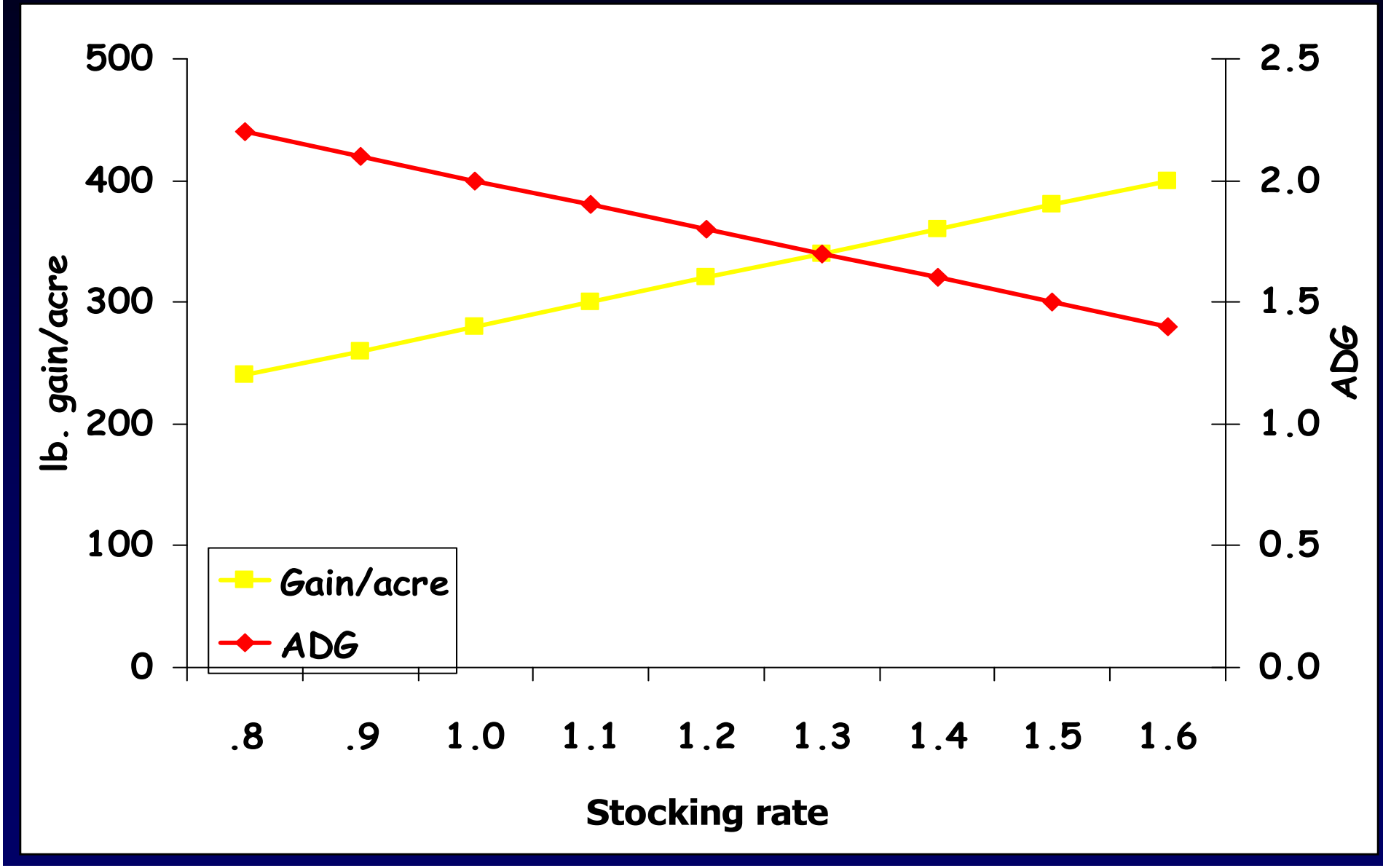
  WHY?
  - Each animal must cover it's own ownership & maintenance costs!

Market Price Determines It

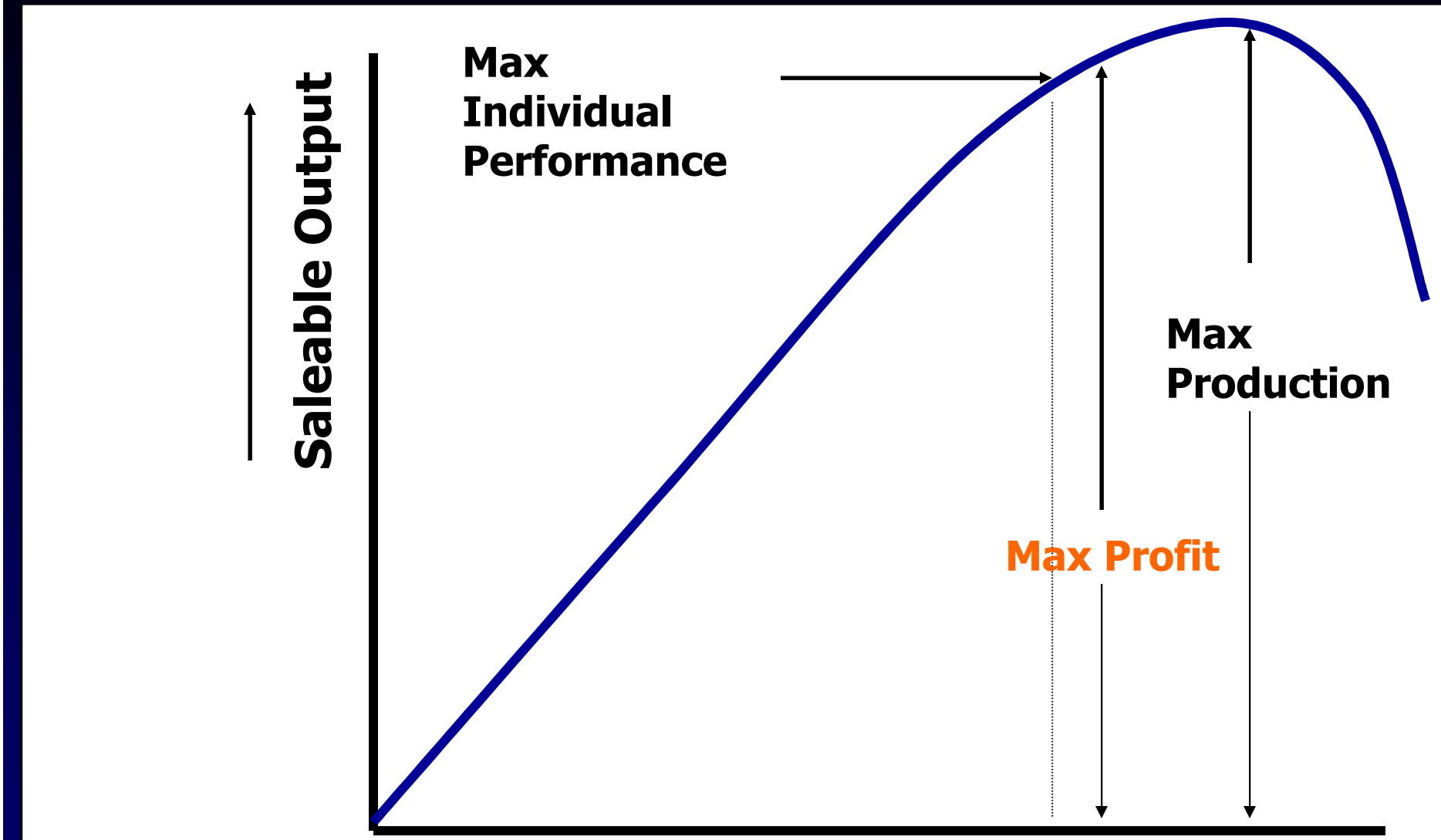
- When profit margins are tight, closer to maximum individual animal performance.
  - (Each animal must perform better to cover it's individual costs.)

- When profit margins are more favorable, closer to maximum gains per acre.
  - (Each animal is generating profits, so cutting costs is not as crucial as increasing output.)

Typical Stocking Rate Effects



Key Production Concepts



(Hypothetical biological relationships and projected point of max profit for illustration purposes)

Other Livestock?

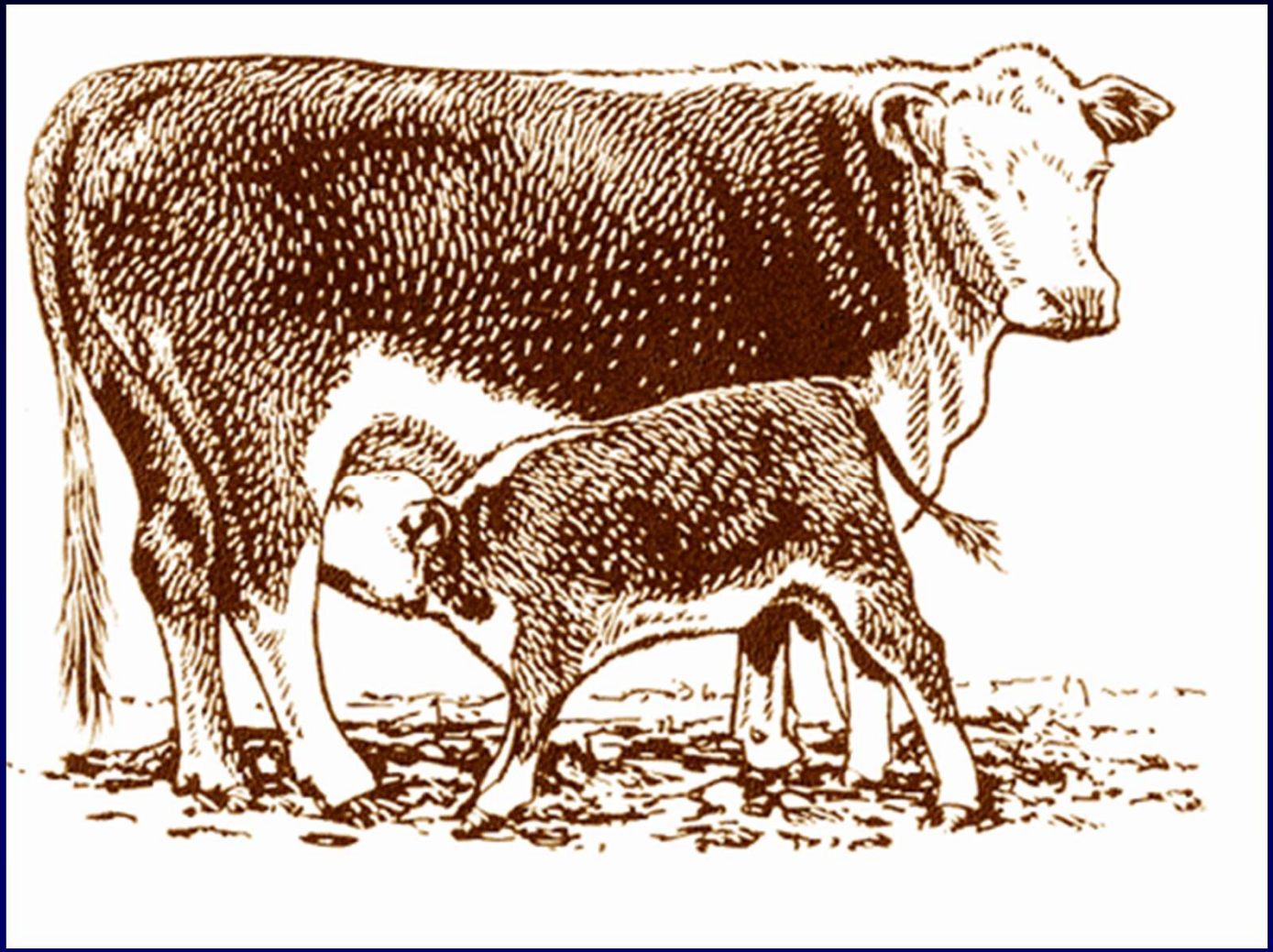
- Cow/Calf, Dairy, Sheep, Goats, Horses, etc.
- As you increase stocking rate individual performance decreases.
- Depending on the current market prices the maximum profit is somewhere between max individual performance and max production/acre.

Important "Take Home" Message!

Management Intensive Grazing

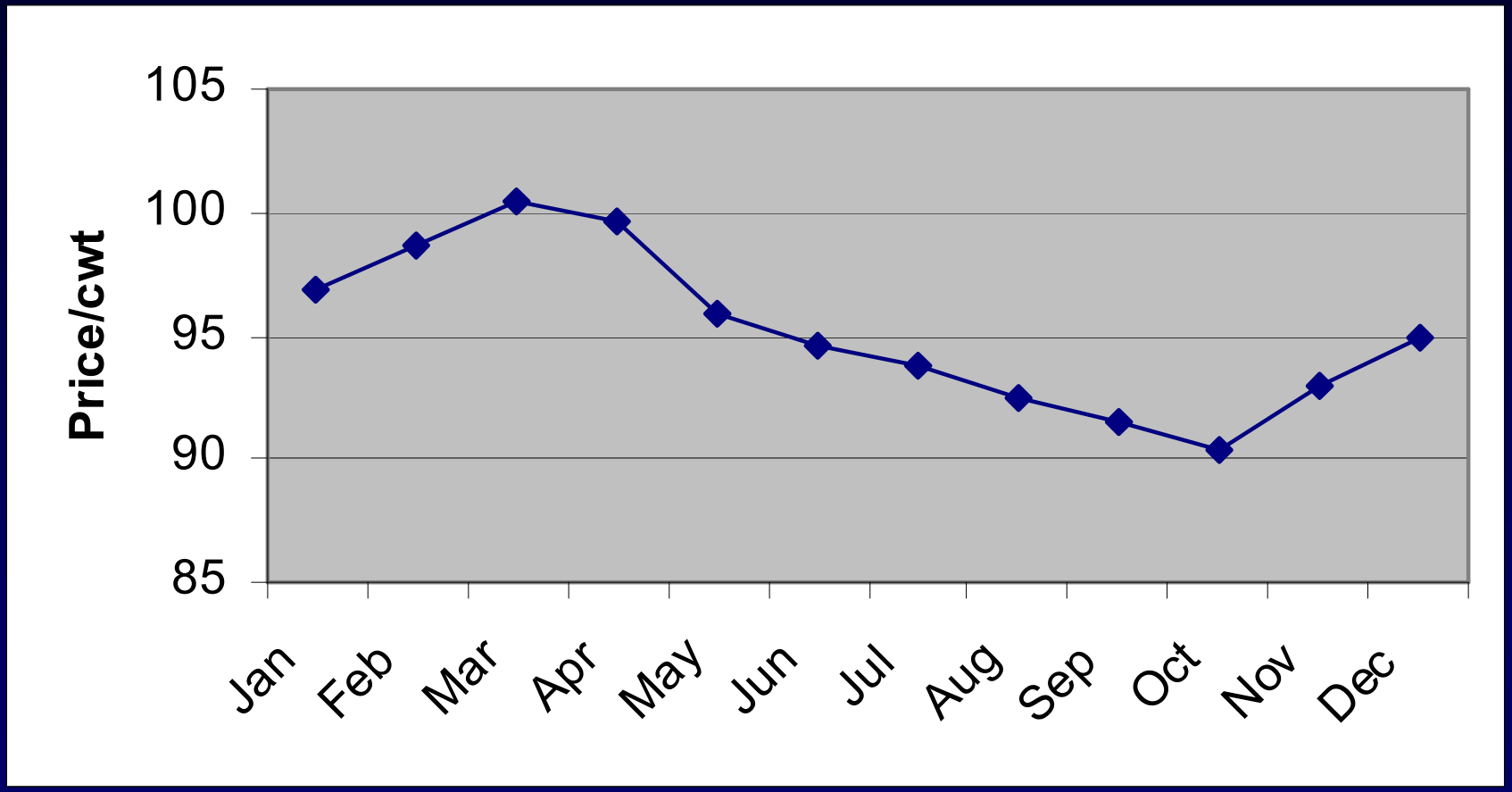
- Goal is to maximize farm net income
- Maximum production per acre is generally not where net returns are maximized, *ESPECIALLY if stocking rate exceeds carrying capacity*

When Do Your Forages Make You The Most Money?



400-500 lb Feeder Steer Price

(1993-02) Medium Frame No. 1, Oklahoma City



Value of 100# of Gain

Starting	Feeder Steers 1993-02 AVG		
Month	450#	550#	650#
	----$/cwt----		
JAN	70.73	59.75	47.80
FEB	54.39	48.91	45.01
MAR	35.74	29.68	33.85
APR	34.16	38.70	45.62
MAY	46.38	48.58	56.05
JUN	46.37	47.40	50.70
JUL	35.52	42.56	46.62
AUG	33.56	42.03	54.65
SEP	50.34	61.12	71.46
OCT	68.41	79.11	89.67
NOV	58.62	61.56	69.48
DEC	64.13	51.16	49.91
AVG	49.86	50.88	55.07

Source: Dr. Ron Plain, Livestock Marketing Specialist, University of Missouri

Forages Aren't All Created Equal

The same forage at different times of the year is worth different amounts

Stockpiled Fescue vs. Hay

- Feeding hay –
  - **$0.80 to $1.00/cow/day**
- Feeding stockpiled fescue –
  - **$0.40 to $0.50/cow/day**
- 20 percent CP in October
  - Drops 2% per month

Billie, Greg, & William Sundwall

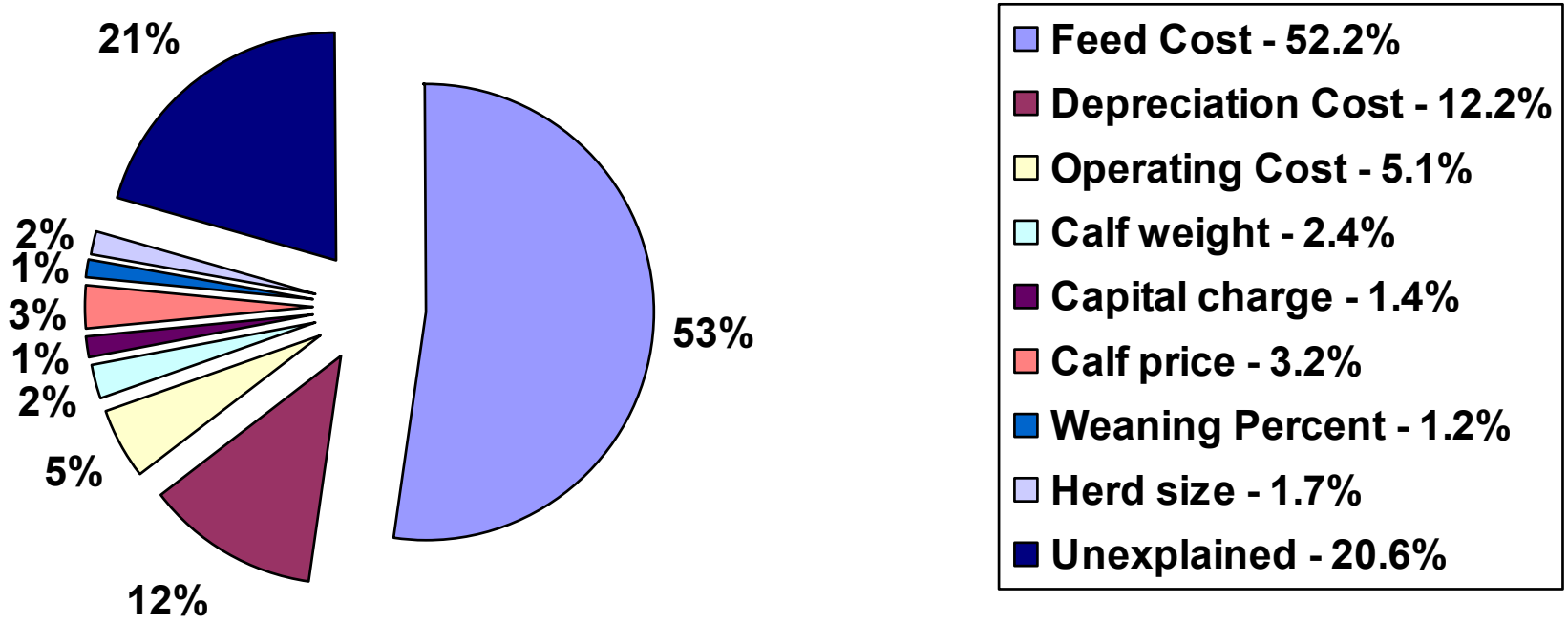
- Cross Timbers, MO
- 140 Cows

- Crossbred Angus Herd

They determined to make it work!

Winter Feeding Equipment

Variation in Returns to Labor & Management Explained by Economic Variables (1996 - 1999)



Source: 2001 Beef Research Report – Iowa State University

Cha-ching!

- 65 % of the variation in profitability of a cow-calf enterprise is due to FEED COST and DEPRECIATION!
- If you want to be consistently profitable (above average) in the cow-calf business your management should focus on minimizing feed costs and depreciation costs.