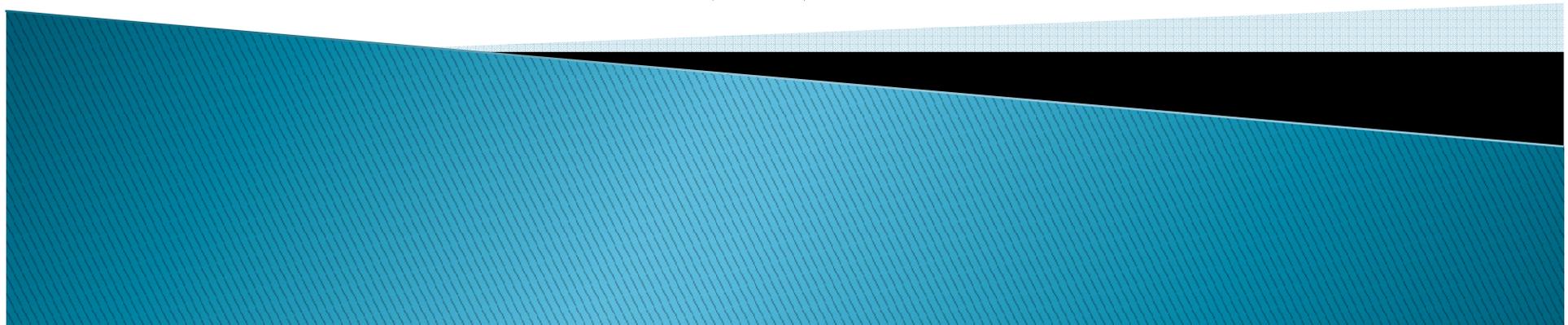




# Wisconsin Dairy Ratio Benchmarking

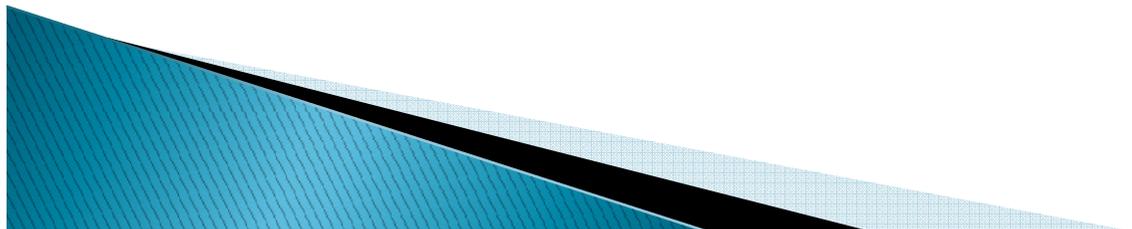
Victor E. Cabrera & Jenny Vanderlin

NORTH CENTRAL  
RISK MANAGEMENT  
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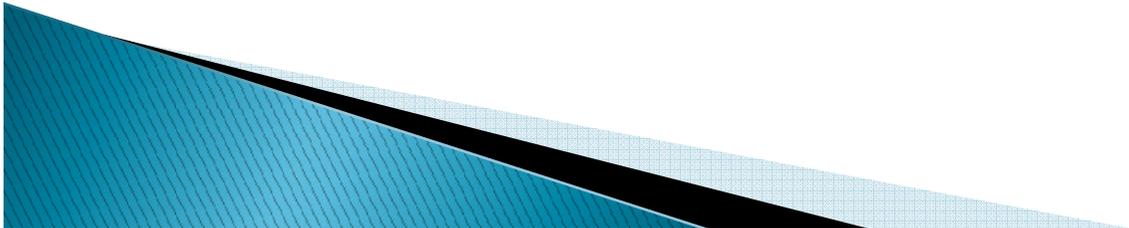
# Benchmarking

- Monitor relationships of:
  - Income generation
  - Investment control
  - Debt control
  - Operating cost control
- Underlies important financial strengths and weaknesses
- Advisable not to use a single benchmark
- Important comparisons could be done using ROROA, ROROE, ATO, OPM, DuPont Analysis



# Financial Indicators

- Sweet-15 financial measures: some people may use more, some people may use less
- Five clusters of financial indicators are always needed
  1. Liquidity
  2. Solvency
  3. Profitability
  4. Repayment Capacity
  5. Financial Efficiency



# Financial Indicators

## 1. Liquidity

- What is the ability of farm to generate enough cash to meet financial obligations (debt, taxes) and to cover family living expenses?

## 2. Solvency

- How much of the farm is funded by debt?

## 3. Profitability

- What is the ability of the farm to generate net income on a consistent basis?



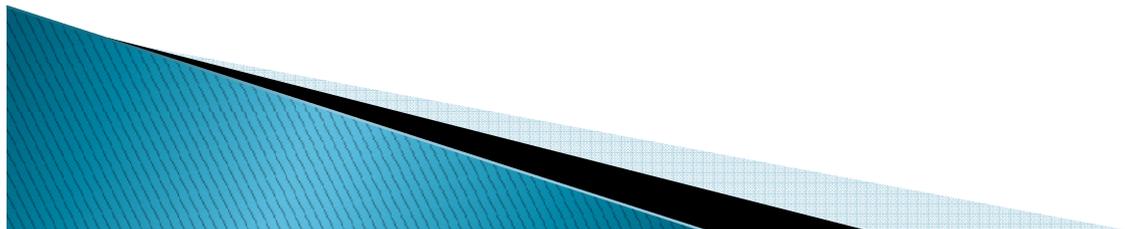
# Financial Indicators

## 4. Repayment Capacity

- How well the farm can pay its bills?

## 5. Financial Efficiency

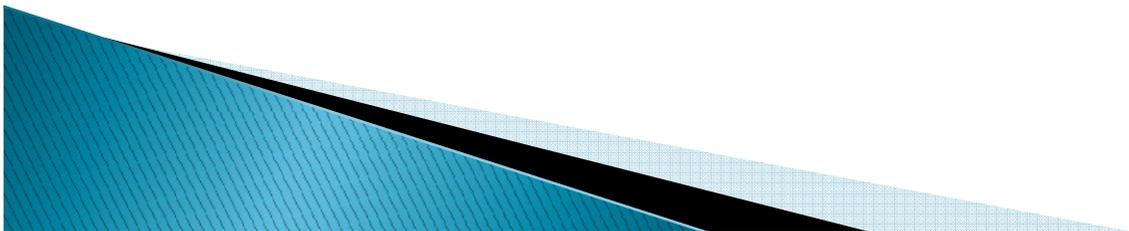
- How well the farm uses its management and capital resources to generate profit?



# 1. Liquidity

a. Current Ratio (CR)

b. Net Working Capital (NWC)



# 1.a. Current Ratio (CR)

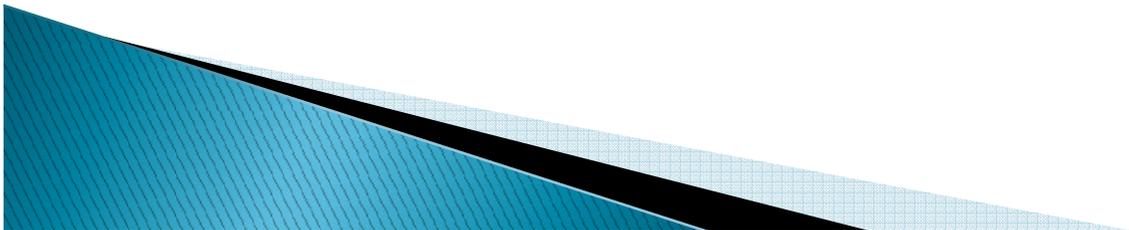
- How well a farm manager can pay the bills this year?
- Current Assets / Current Liabilities
- > 1.1, > 1.7, Higher Better
- Improve it by:
  - Increase cash reserves in good years
  - Improve profitability
  - Restructure debt
  - Sell under utilized assets to pay debt

# 1.b. Net Working Capital (NWC)

- How much capital remains after paying bills this year?
- Current Assets – Current Liabilities
- $> 0$ , Higher Better
- Improve it by:
  - Increase cash reserves in good years
  - Improve profitability
  - Restructure debt

## 2. Solvency

- a. Debt to Asset Ratio ( $D/A$ )
- b. Equity to Asset Ratio ( $E/A$ )



## 2.a. Debt to Asset Ratio (D/A)

- What part of the farm is owned by the bank?
- Total Farm Liabilities / Total Farm Assets
- <60%, <30%, Lower Better, New farms or recently expanded farms have higher D/A
- Improve it by:
  - Do nothing if farm is profitable: debt will decrease over time
  - Improve profitability
  - Take on (additional) partners



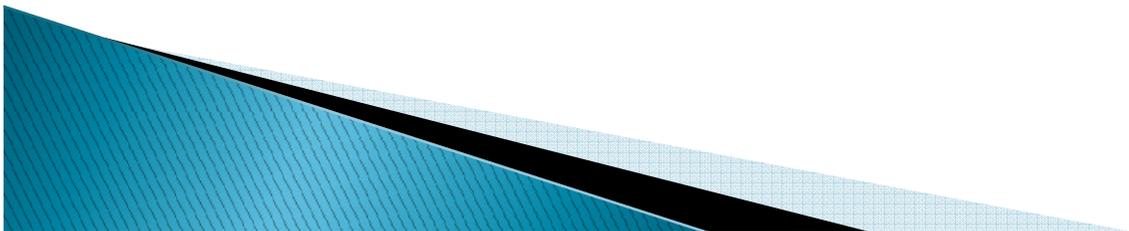
## 2.b. Equity to Asset Ratio (E/A)

- How much of the farm the farmer owns?
- Total Farm Equity / Total Farm Assets
- >40%, >70%, Higher Better, New farms or recently expanded farms have lower E/A
- Improve it by:
  - Do nothing if farm is profitable: debt will decrease over time
  - Improve profitability
  - Take on (additional) partners



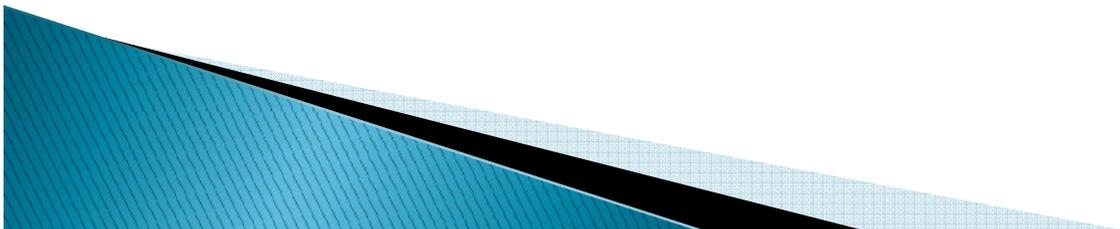
# 3. Profitability

- a. Net Farm Income (NFI)
- b. Rate of Return on Farm Assets (ROROA)
- c. Rate of Return on Farm Equity (ROREA)
- d. Operating Profit Margin Ratio (OPM)



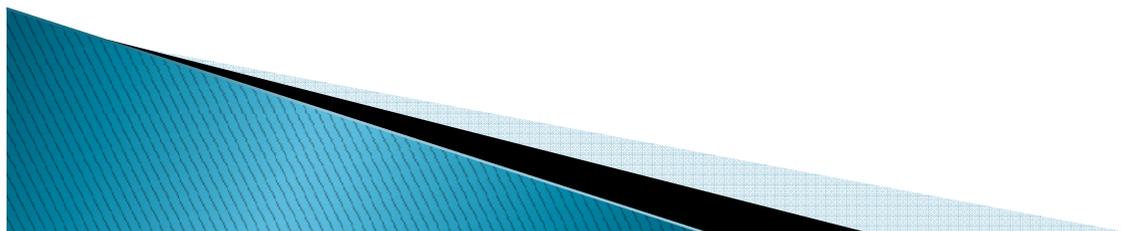
# 3.a. Net Farm Income (NFI)

- How much farm profit is available to farmer?
- Farm Revenues – Farm Expenses
- $> 0$ , Higher Better, Competitive with other investment opportunities
- Improve it by:
  - Improve profitability through:
    - Better marketing
    - Decreasing costs of production
  - Expand
  - Decrease number of partners
  - Sell under-utilized assets



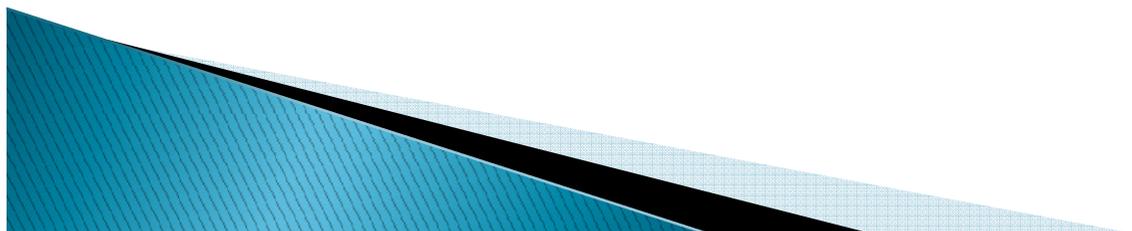
# 3.b. Rate of Return on Farm Assets (ROROA)

- What is the return on the farm assets?
- $(\text{Net Farm Income} + \text{Interest Paid} - \text{Value Unpaid Labor \& Management}) / \text{Average Farm Assets}$
- >4%, >8%, Higher Better, Competitive with other investment opportunities, Larger than bank interest
- Improve it by:
  - Improve profitability through:
    - Better marketing
    - Decreasing costs of production
  - Determine unrealized income such as increased land value
  - Renting productive assets, if profitable



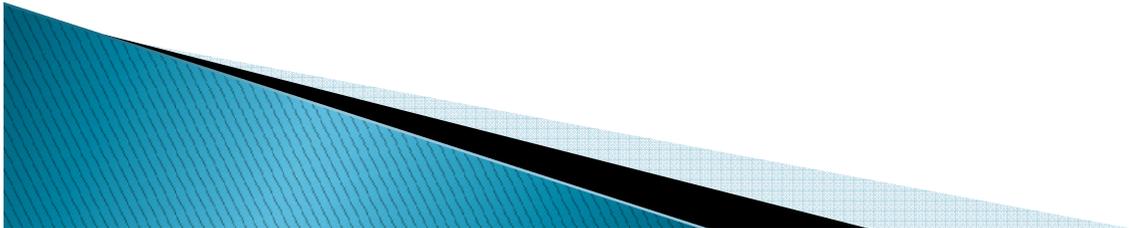
# 3.c. Rate of Return on Farm Equity (ROROE)

- What is the return on farm investment?
- $(\text{Net Farm Income} - \text{Value Unpaid Labor \& Management}) / \text{Average Farm Assets}$
- > 3%, > 10%, Higher Better, Competitive with other investment opportunities, Larger than bank interest
- Improve it by:
  - Improve profitability through:
    - Better marketing
    - Decreasing costs of production
  - Determine unrealized income such as increased land value
  - Rent productive assets, if profitable



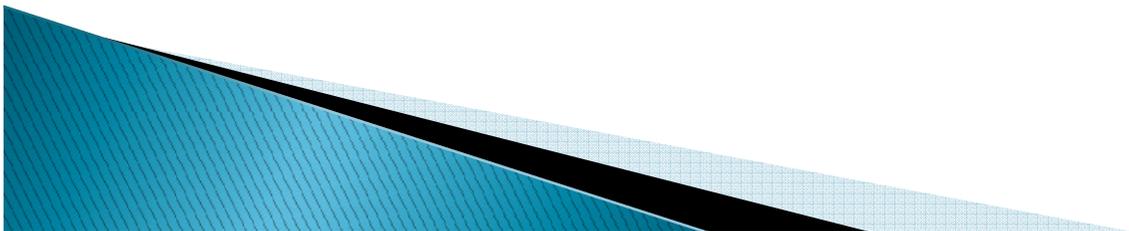
# 3.d. Operating Profit Margin Ratio (OPM)

- What proportion of farm revenue is profit?
- $(\text{Net Farm Income} + \text{Interest Paid} - \text{Value Unpaid Labor \& Management}) / \text{Gross Farm Revenues}$
- > 15%, > 25%, Higher Better, Competitive with other investment opportunities, Generates sufficient level of income
- Improve it by:
  - Improve profitability through:
    - Better marketing
    - Decreasing costs of production



# 4. Repayment Capacity

- a. Term Debt Coverage Ratio (TDCR)
- b. Replacement Margin (RM)



# 4.a. Term Debt Coverage Ratio (TDCR)

- How well farm generates cash to pay term debts?
- $(\text{Net Farm Income} + \text{Non-Farm Income} + \text{Scheduled Interest on Debt} - \text{Income Tax} - \text{Family Living Expenses}) / (\text{Scheduled Interest and Principal Debt, and Capital Lease Payments})$
- > 120%, > 150%, Higher Better
- Improve it by:
  - Improve profitability
  - Improve non-farm income
  - Restructure debt
  - Improve tax management
  - Decrease family living expenses



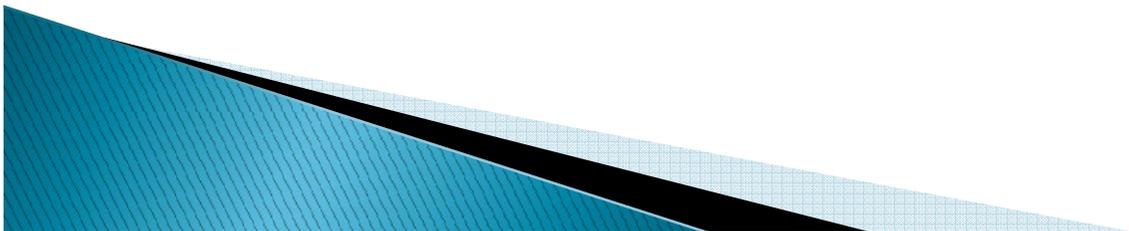
## 4.b. Replacement Margin (RM)

- How much income remains for the farm after paying all bills?
- $\text{Net Farm Income} + \text{Non-Farm Income} - \text{Income Tax} - \text{Family Living Expenses} - \text{Scheduled Interest and Principal Debt, and Capital Lease Payments}$
- $> 0$ , Higher Better
- Improve it by:
  - Improve profitability
  - Improve non-farm income
  - Restructure debt
  - Improve tax management
  - Decrease family living expenses



# 5. Financial Efficiency

- a. Asset Turnover Ratio (ATO)
- b. Operating Expense Ratio (OER)
- c. Depreciation Expense Ratio (DER)
- d. Interest Expense Ratio (IER)
- e. Net Farm Income Ratio



# 5.a. Asset Turnover Ratio (ATO)

- What is the farm efficiency on capital use?
- $\text{Gross Farm Revenues} / \text{Average Total Assets}$
- > 30%, > 45%, Higher Better, Competitive with other investments
- Improve it by:
  - Improve marketing
  - Rent additional assets if profitable
  - Assess asset valuation

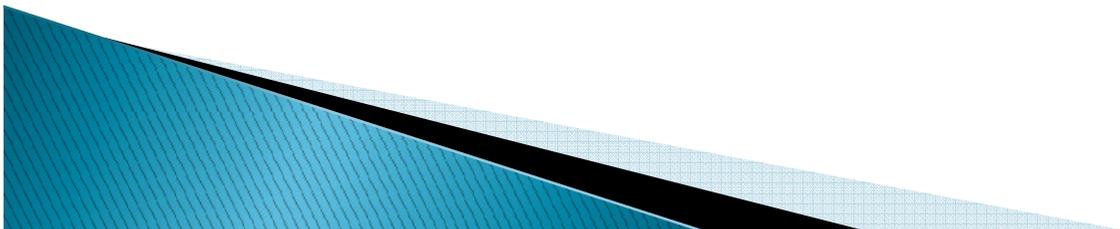
## 5.b. Operating Expense Ratio (OER)

- What is the proportion of gross farm revenues committed to pay operating expenses?
- $(\text{Total Farm Operating Expenses} + \text{Purchased Feed \& Feeder Livestock} - \text{Depreciation}) / \text{Gross Farm Revenues}$
- <80%, <60%, Lower Better, Competitive with other investments
- Improve it by:
  - Improve marketing
  - Improve production cost per unit
  - Decrease feed costs
  - Increase gross farm income



# 5.c. Depreciation Expense Ratio (DER)

- What is the proportion of gross farm revenues committed to compensate depreciation expenses?
- Depreciation Expenses / Gross Farm Revenues
- < 15%, < 5%, Lower Better, Competitive with other investments
- Improve it by:
  - Assess depreciation shield
  - Compare benefits of used vs. new equipment
  - Decrease the number of equipment
  - Compare benefits of custom hire vs. ownership
  - Assess technologies that require less equipment



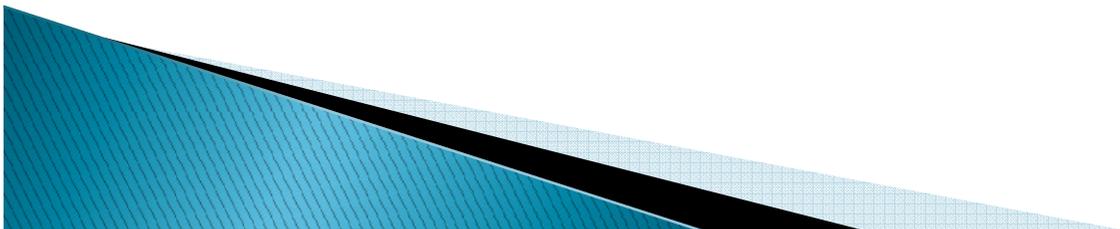
# 5.d. Interest Expense Ratio

- What is the proportion of gross farm revenues committed to pay interest expenses?
- Interest Expenses / Gross Farm Revenues
- < 10%, < 5%, Lower Better, Competitive with other investments
- Improve it by:
  - Improve profitability and make additional principal payments
  - Increase cash revenues in good years to reduce the need of operating loans on bad years
  - Restructure debt



## 5.e. Net Farm Income Ratio (NFIR)

- What is the proportion of gross farm revenues available to compensate for unpaid labor and management?
- $\text{Net Farm Income} / \text{Gross Farm Revenues}$
- $> 10\%$ ,  $> 20\%$ , Lower Better, Competitive with other investments, Generating a sufficient income level
- Improve it by:
  - Improve profitability through:
    - Better marketing
    - Decreasing production costs



# Wisconsin Dairy Farm Ratio Benchmarking Tool

- Sweet-15 financial analysis measures
- Benchmarking with +500 Wisconsin farms (AgFA)
- Cluster analysis
  - Year
  - Herd size: 50, 100, 150, 300, >300
  - Income/cow: \$4,000, \$4,500, \$5,000, >\$5,500
  - Milk/cow: 16,000, 19,000, 22,000, >25,000
- DuPont analysis
  - $ROROA = ATO * OPM$



# Wisconsin Dairy Farm Ratio Benchmarking Tool

**Wisconsin Dairy Farm Ratio Benchmarking**  
 Victor E. Cabrera & Jenny Vanderlin

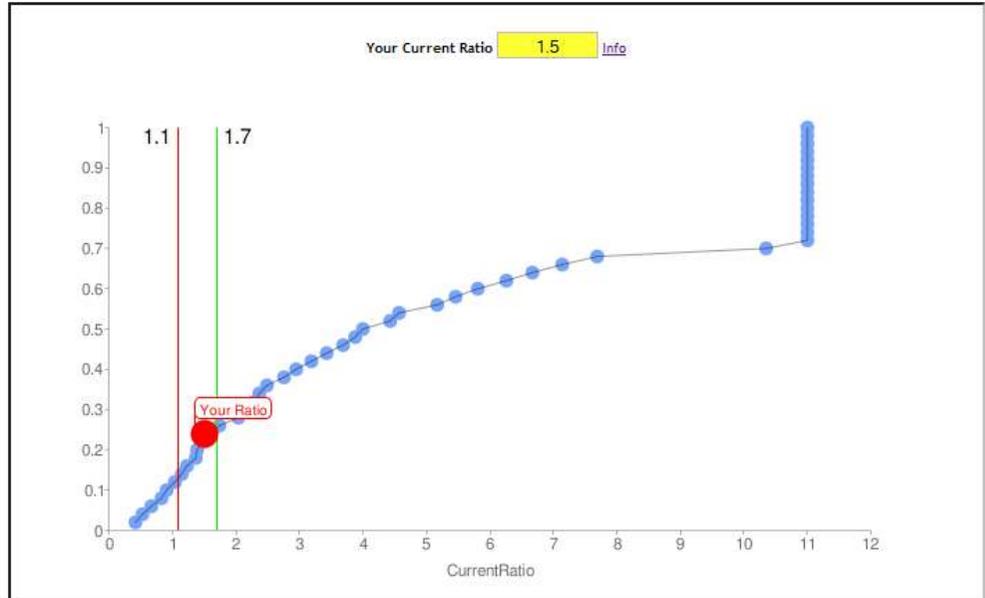
THE UNIVERSITY OF WISCONSIN MADISON | UW Extension | CENTER FOR DAIRY PROFITABILITY | NORTH CENTRAL RISK MANAGEMENT EDUCATION CENTER | EXCELLENCE IN EDUCATION AND DISCOVERY

Year: 2000  
 Herd Size: <50  
 Inc/Cow: <40000  
 Milk/Cow: <16000

- Overview
- Liquidity**
- Solvency
- Profitability
- Repayment
- Efficiency
- Du Pont
- Summary
- Definitions

## Liquidity

### Current Ratio



Net Working Capital (NWC)



# Wisconsin Dairy Farm Ratio Benchmarking Tool

YEAR 2008

HERD SIZE >50<=100

INC/COW >5000<=5500

MILK/COW >25000

YEAR 2008

HERD SIZE >50

INC/COW >50

MILK/COW >25

2000  
2001  
2002  
2003  
2004  
2005  
2006  
2007  
2008

YEAR 2008

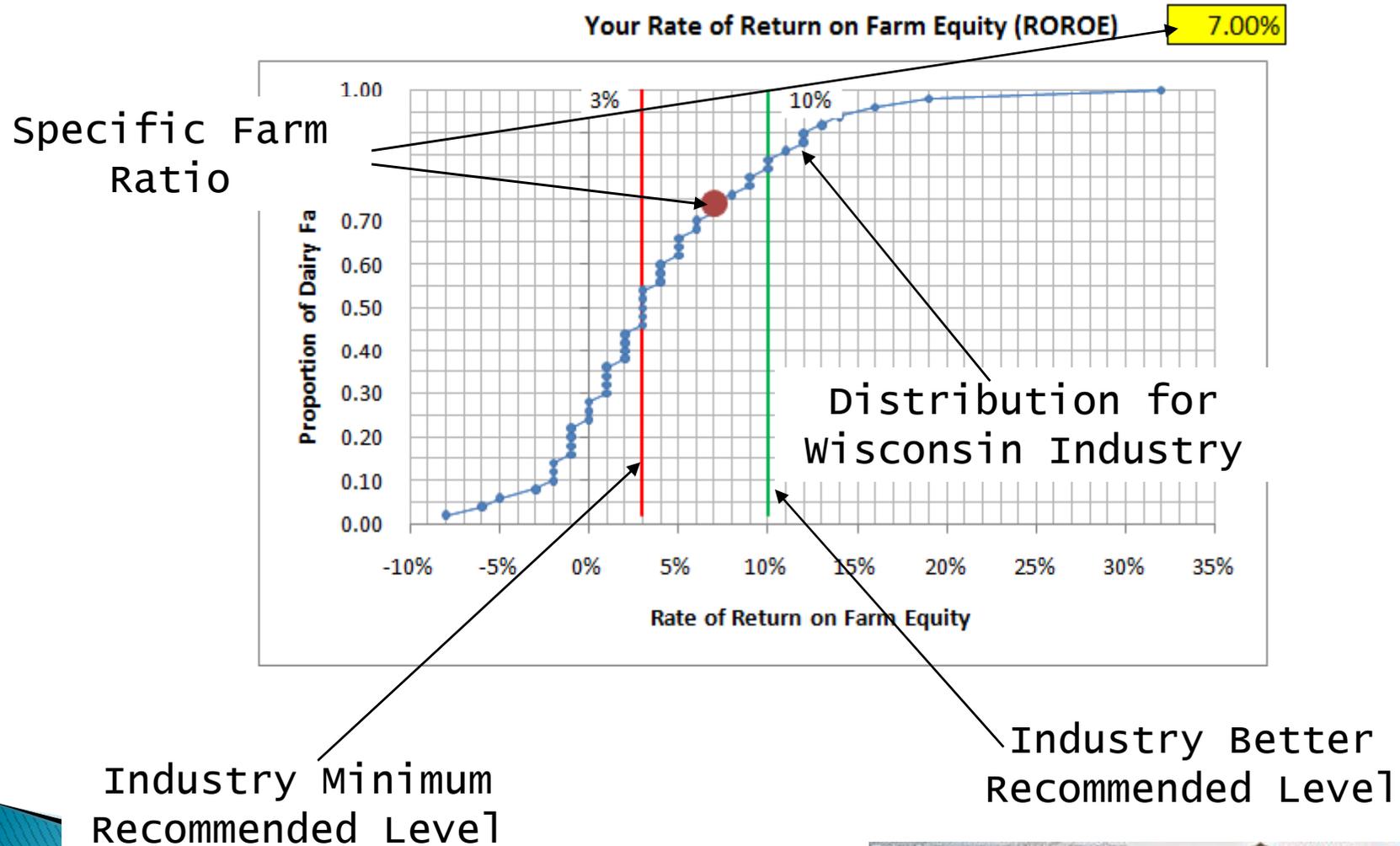
HERD SIZE >50<=100

INC/COW

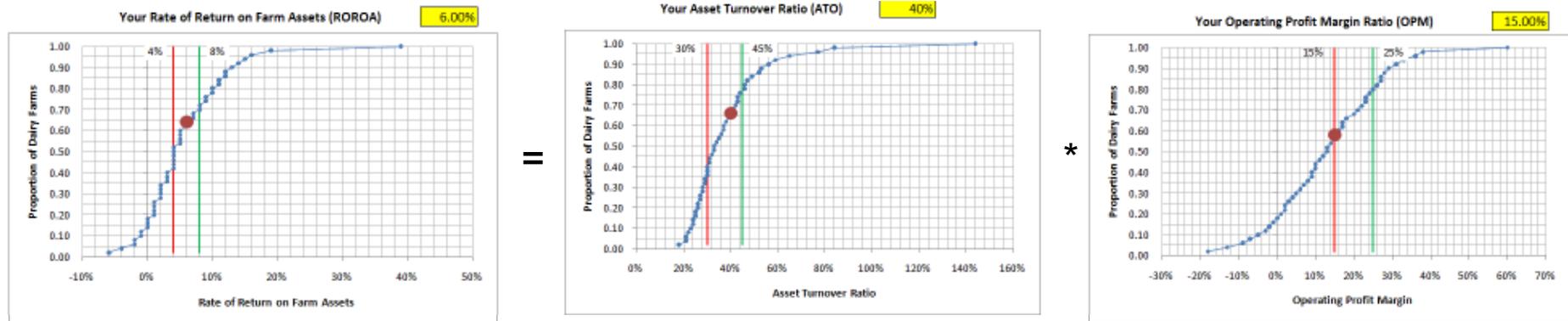
MILK/COW

<=50  
>50<=100  
>100<=150  
>150<=300  
>300

# Wisconsin Dairy Farm Ratio Benchmarking Tool



# Wisconsin Dairy Farm Ratio Benchmarking Tool



Du Pont Analysis			
	Rate of Return on Assets (ROROA)%	Asset Turnover Ratio (ATO)	Operating Profit Margin (OPM) %
<b>Wisconsin Farms</b>	2.18	0.369	5.92
<b>Your Farm</b>	6	0.4	15

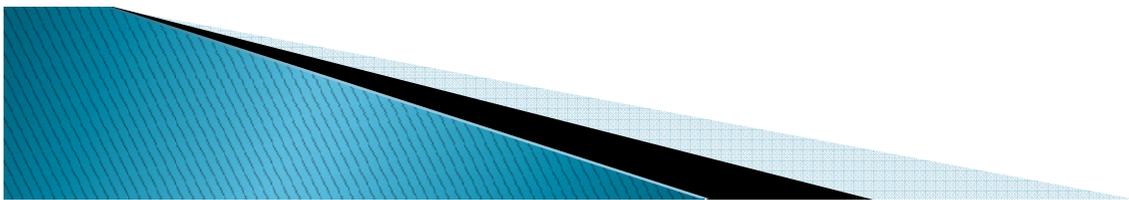
For every dollar invested in assets you had **\$0.06** of profit,  
 for every dollar invested in assets you had **\$0.4** of revenue and  
 for every dollar of total revenue you had **\$0.15** of profit.  
 Consequently your rate of return of **6%** is **0.4** of total revenue times **0.15** of profit.



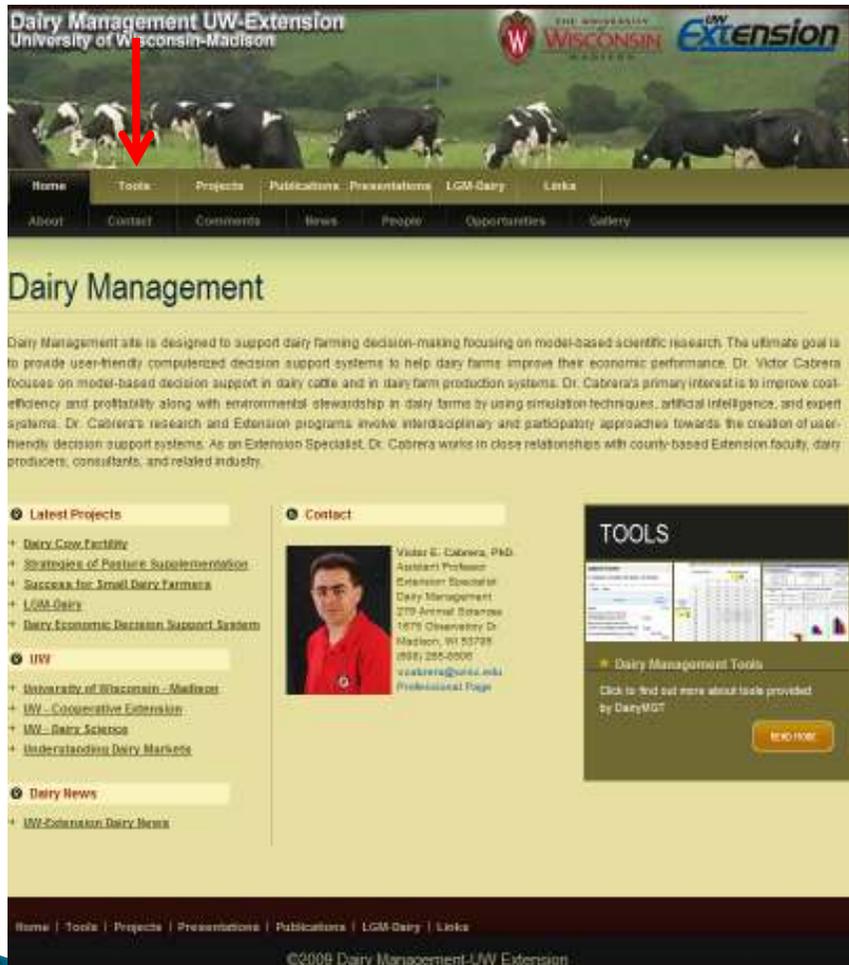
# Wisconsin Dairy Farm Ratio Benchmarking Tool

Overview	Liquidity	Solvency	Profitability	Repayment	Efficiency	Du Pont	Summary	Definitions
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Ratio	Wisconsin Ratio	Your Ratio	Percentile
Current Ratio (CR)	5.56	1.5	22
Net Working Capital (NWC)	141797.08	50000	26
Debt/Asset Ratio (D/A)	24.16	35	28
Equity Asset Ratio (E/A)	77.86	65	24
Net Farm Income (NFI)	28614.42	50000	86
Return on Farm Assets (ROROA)	5.14	6	74
Return on Farm Equity (ROROE)	1.6	5	76
Operating Profit Margin (OPM)	5.92	15	70
Term Debt Coverage Ratio (TDCR)	152.34	140	58
Replacement Margin (RM)	18381.32	50000	84
Asset Turnover Ratio (ATO)	36.9	40	80
Operating Expenses Ratio (OER)	67.7	70	38
Depreciation Expenses Ratio (DER)	11.1	10	60
Interest Expense Ratio (IER)	3.48	8	16
Net Farm Income Ratio (NFIR)	18.94	15	36



# DairyMGT.info



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## Dairy Management

Dairy Management info is designed to support dairy farming decision-making focusing on model-based scientific research. The ultimate goal is to provide user-friendly computerized decision support systems to help dairy farms improve their economic performance. Dr. Victor Cabrera focuses on model-based decision support in dairy cattle and in dairy farm production systems. Dr. Cabrera's primary interest is to improve cost-efficiency and profitability along with environmental stewardship in dairy farms by using simulation techniques, artificial intelligence, and expert systems. Dr. Cabrera's research and Extension programs involve interdisciplinary and participatory approaches towards the creation of user-friendly decision support systems. As an Extension Specialist, Dr. Cabrera works in close relationships with county-based Extension faculty, dairy producers, consultants, and related industry.

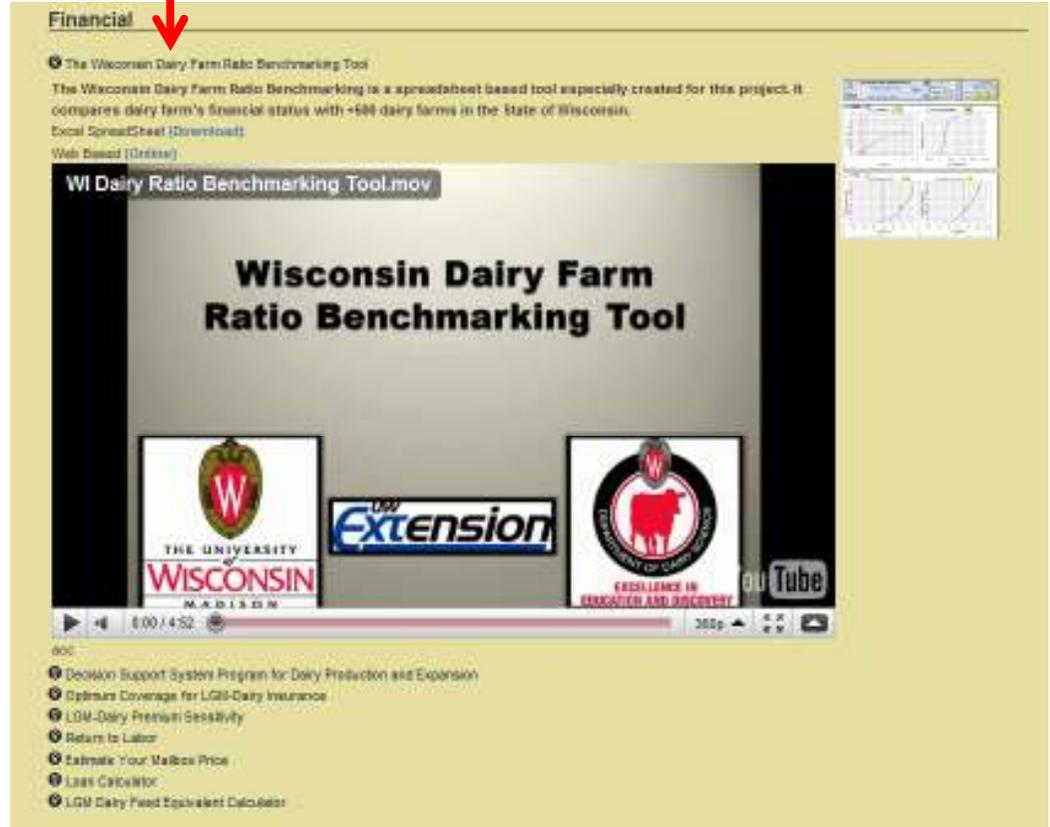
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  - Dairy Cow Comfort
  - Strategies of Pasture Supplementation
  - Success for Small Dairy Farmers
  - LGM-Dairy
  - Dairy Economic Decision Support System
- UW**
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**TOOLS**

**Dairy Management Tools**  
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## Financial

The Wisconsin Dairy Farm Ratio Benchmarking Tool

The Wisconsin Dairy Farm Ratio Benchmarking is a spreadsheet based tool especially created for this project. It compares dairy farm's financial status with +600 dairy farms in the State of Wisconsin.

Excel Spreadsheet (Download)

Web Based (Online)

### WI Dairy Ratio Benchmarking Tool.mov

**Wisconsin Dairy Farm Ratio Benchmarking Tool**

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Decision Support System Program for Dairy Production and Expansion

- Optimum Coverage for LGM-Dairy Insurance
- LGM-Dairy Premium Sensitivity
- Return to Labor
- Estimate Your Milkbox Price
- Least Cost/Milk
- LGM Dairy Feed Equivalent Calculator



