

# The Profit Opportunity Analyzer<sup>®</sup>

Ron Curran, MBA; AgSource  
Victor Cabrera, Ph.D; UWEX



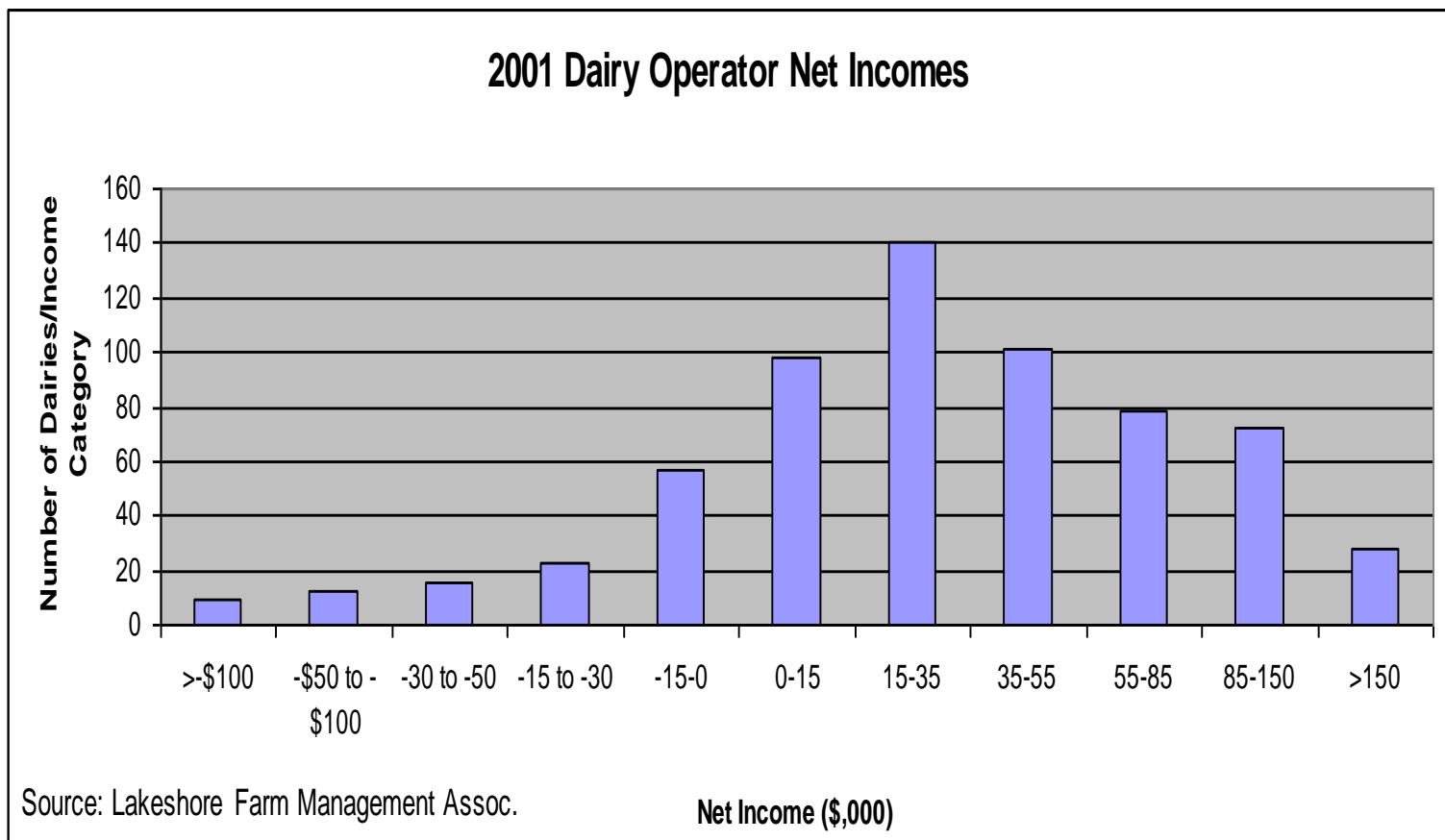
# Key Concepts...

- Why the Profit Opportunity Analyzer (POA) was developed
- What's behind the calculations
- Inter-relationships we learned about
- How you can use it



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# Bell shaped income curve



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# Widely divergent incomes, yet

- All farms in same geographical area
- All receiving about the same prices for their products
- All paying about the same price for supplies
- All dealing with about the same weather and soil



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# “Secrets” to management success

- The most profitable operators...
  - Identify their biggest profit bottlenecks
  - Focus on fixing them
- What the Profit Opportunity Analyzer does...
  - Identifies the biggest profit bottlenecks
  - Focuses the management team on fixing them



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# Who are customers for this product?

- AgSource members
- Producers who want to control their future
- Producers who want to make more money
- Producers with large or small herds, this product is size neutral



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# Why the Profit Opportunity Analyzer was developed

- Wanted to make our DHI numbers more meaningful – differentiate AgSource
- When times are hard (summer of 2005) producers invariably cut expenses. Not always the smartest move. We can identify far larger income opportunities.
- Industry input



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# A few Profit Opportunity Analyzer basics

- Only available for Holstein and Jersey herds
  - Holstein dairies divided by herd size: <100 cows, 100-250, 251-500 and >500 cows
- Order on the AgSource website or handouts
- Results e-mailed out, generally within 24 hours
- \$75.00 per report

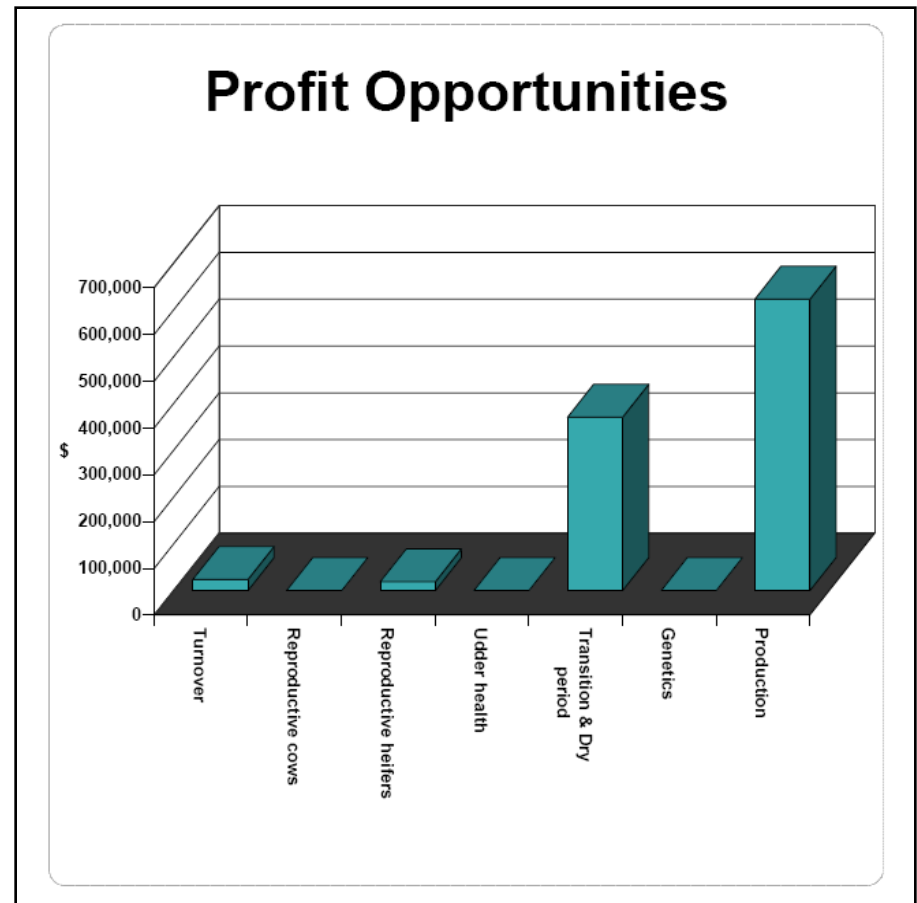


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# What's behind the calculations?

- Management areas focused on...
- Use of benchmarks
  - Compares to 80<sup>th</sup> percentile peer group performance
  - Benchmarks are like the Pirate's Code (more like a set of guidelines). Not the Law



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# What are “Profit Opportunities”

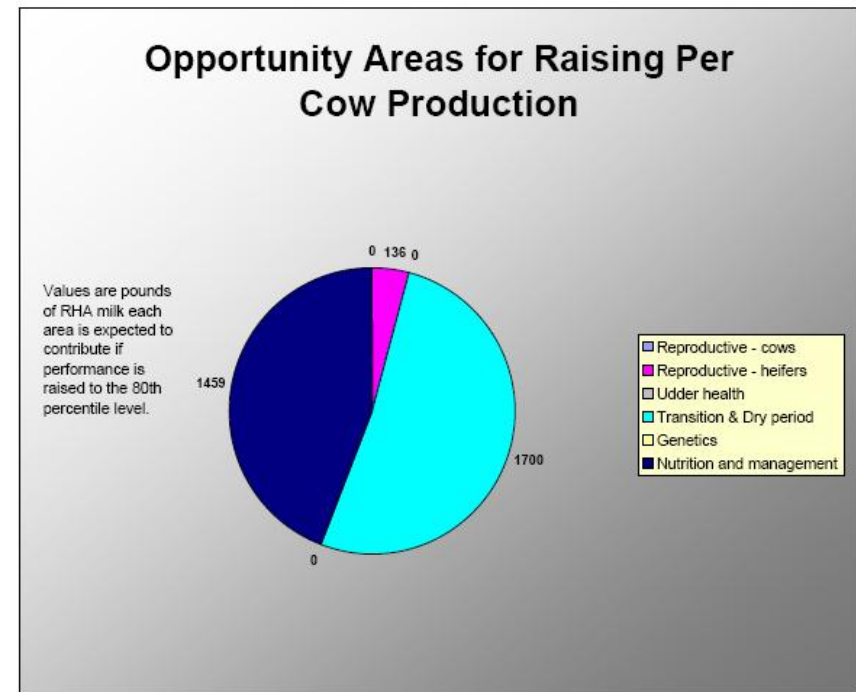
- Not exactly “profit”
- More like “income opportunities”
  - Why?
- Made up of income from production increases
- Other income sources & lowering expenses



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# Production increases

- Reproduction
- Udder health
- Transition & dry period
- Genetics
- Nutrition & management
- Not – Turnover mgmt.



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# Turnover Management



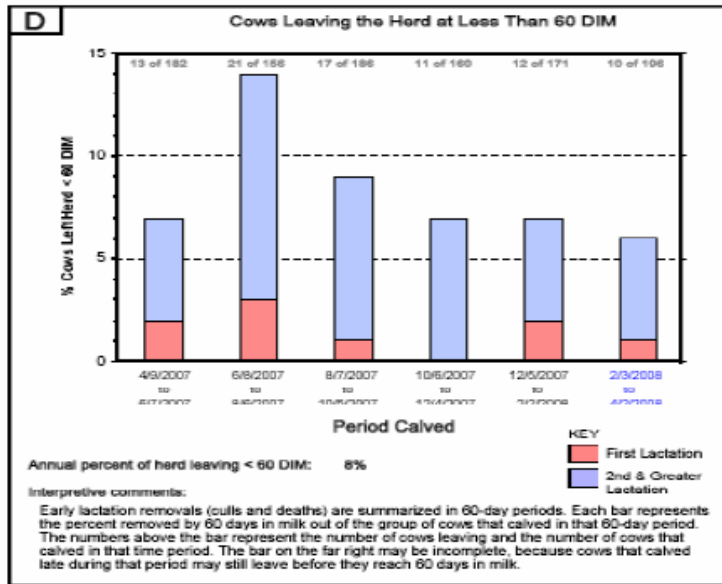
Your dairy's turnover management profit opportunity from lowering Annual turnover and death loss to 30% and 5.1% respectively  
(Annual turnover does not include dairy sales)

\$23,900

AgSource Benchmarks for Herds Over 500 Cows			
	80th Percentile	Average	20th Percentile
Annual turnover percentage (Excluding dairy)	29%	34%	39%
Annual death rate percentage	5.5%	7.9%	9.7%

Over the past year...	Your herd percent	Your herd No. of cows over 80th percentile	Profit Opportunity
Turnover (Excluding sales for dairy)	30%	9.6	\$ 19,200
Death loss	6.4%	9.5	\$ 4,700

Your dairy's trend...  
(Early lactation turnover is an indicator of annual turnover trends)



“Big picture” number

Benchmarks

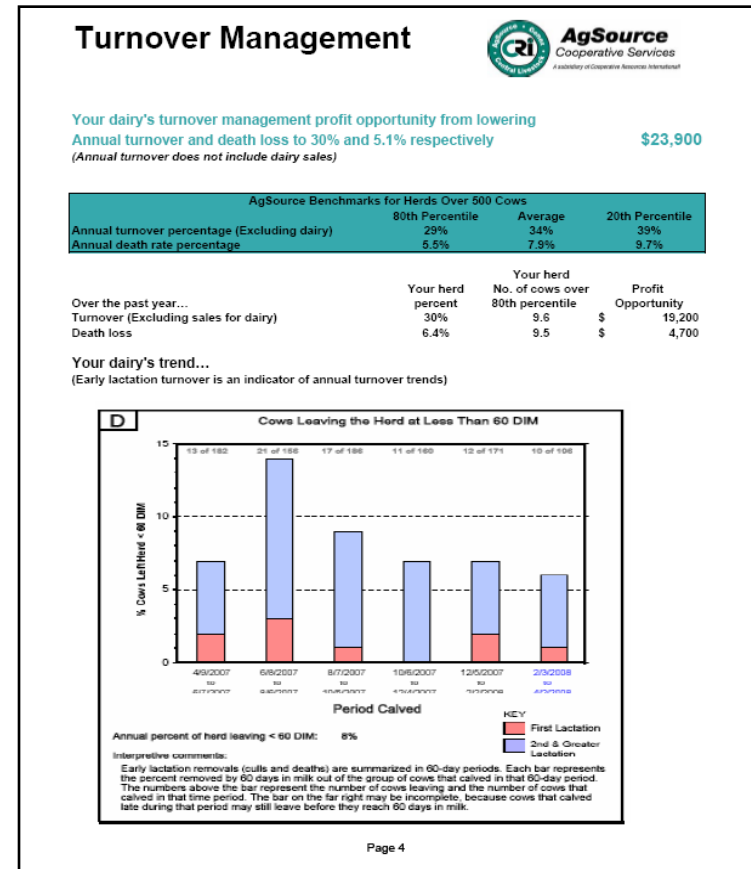
Detail of opportunities

Trend graph – balances use of annual figures in calculations

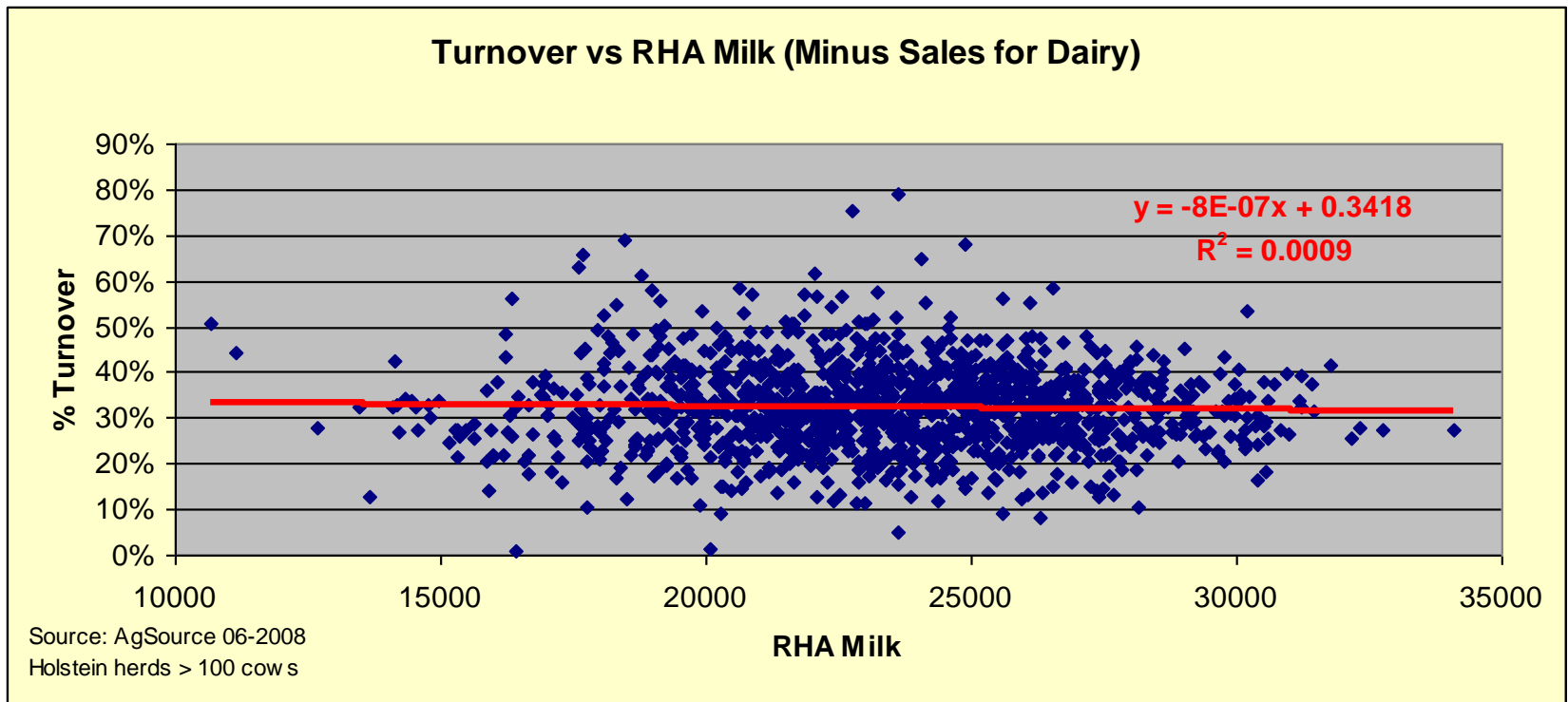


# Let's stop for a minute...

- Is the 80<sup>th</sup> percentile the “ideal” turnover rate? (No, it's a guideline)
- Why are sales for dairy removed from turnover? Sales from dairy help maximize income – a good thing
- What question are we trying to answer?
  - Individual culling decision? - No, we are looking at the bigger question of overall turnover. Is there an opportunity to raise profits?



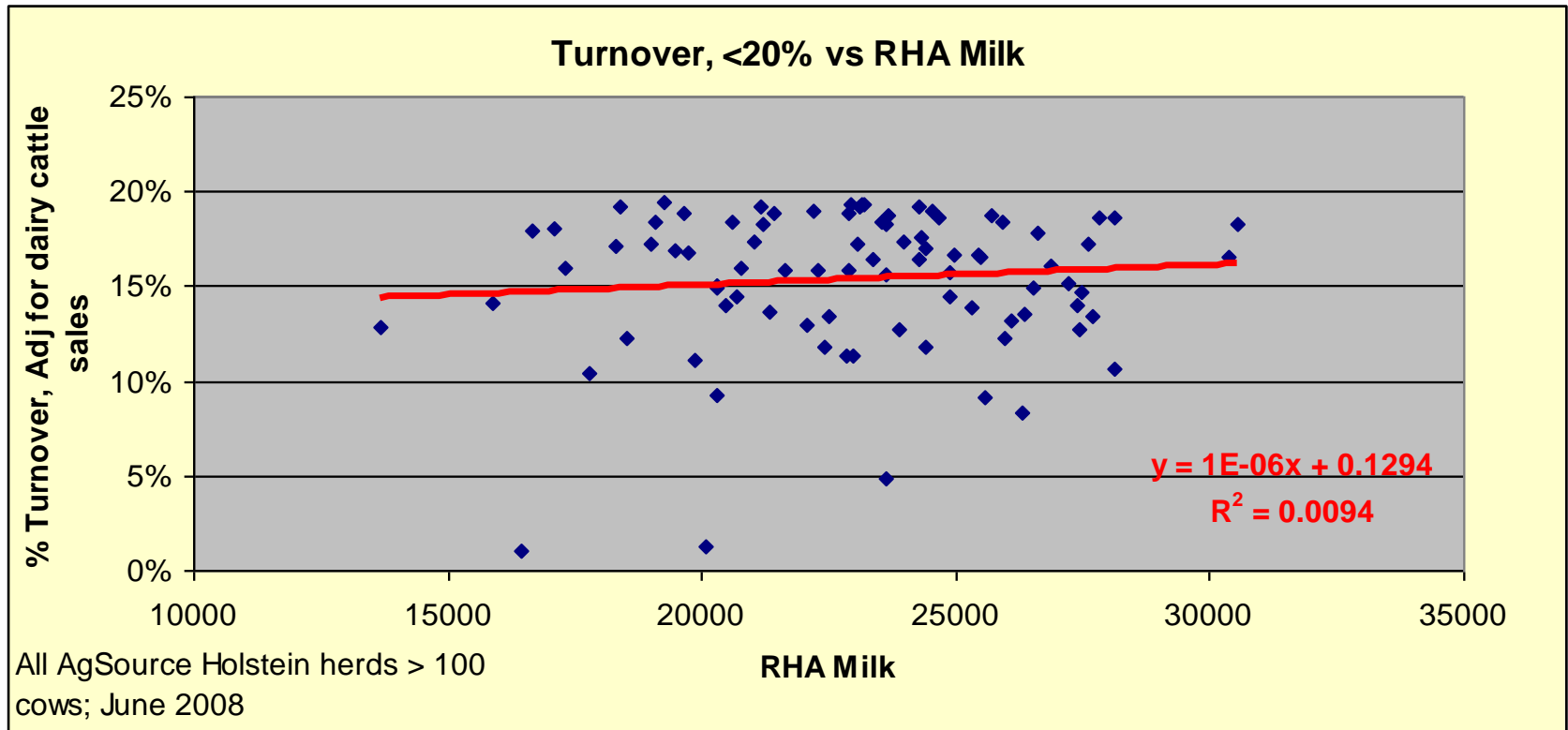
# Do herds with higher turnover have higher production?



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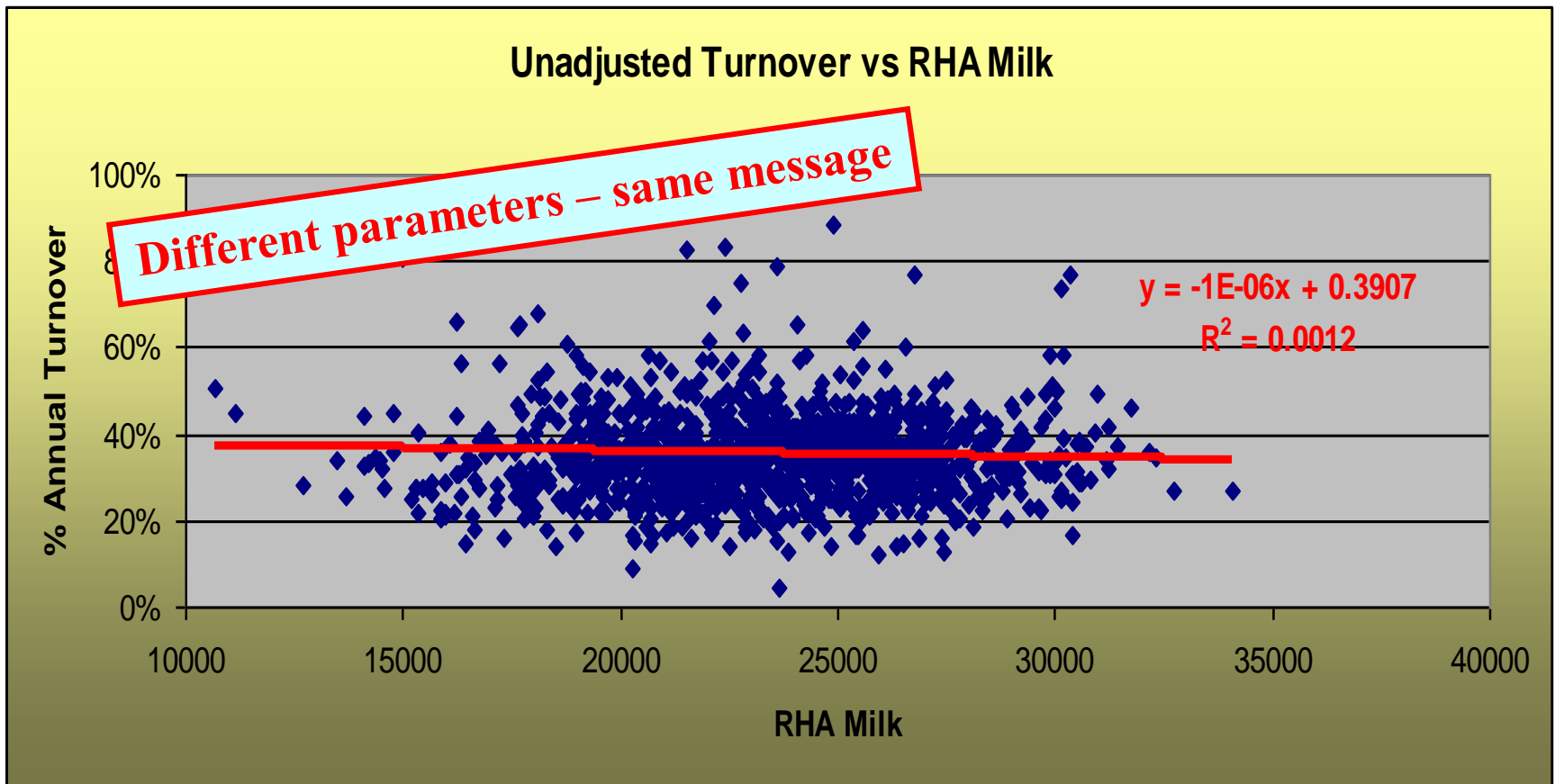
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# What about low turnover herds?



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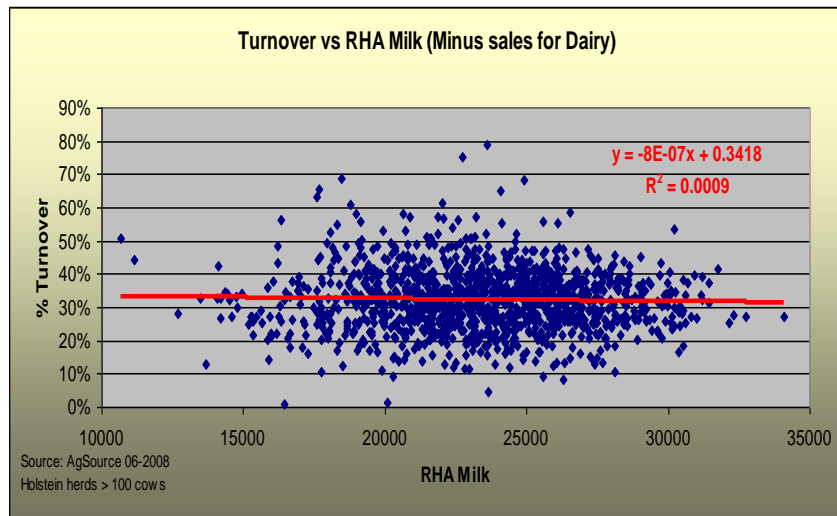
# Let's forget about sales for dairy



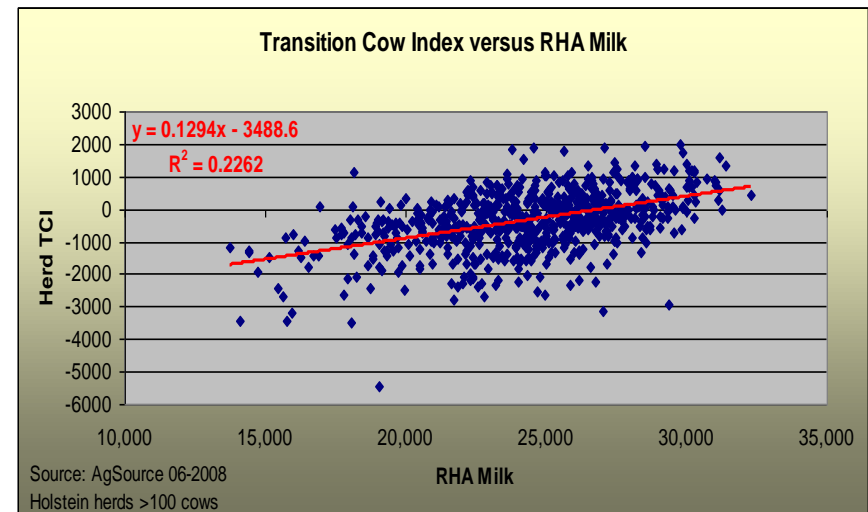
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# So, what can we learn?



No relationship to higher production



Transition Cow Index® (reflecting fresh cow management), by contrast, is related to higher production

1. Higher turnover does not appear to be related to higher production
2. Higher turnover has costs (either opportunity or actual)
3. Higher than 80<sup>th</sup> percentile turnover (adjusted for dairy sales) should be avoided



# Reproductive Management Milking Herd



Your dairy's reproductive management profit opportunity

**\$124,000**

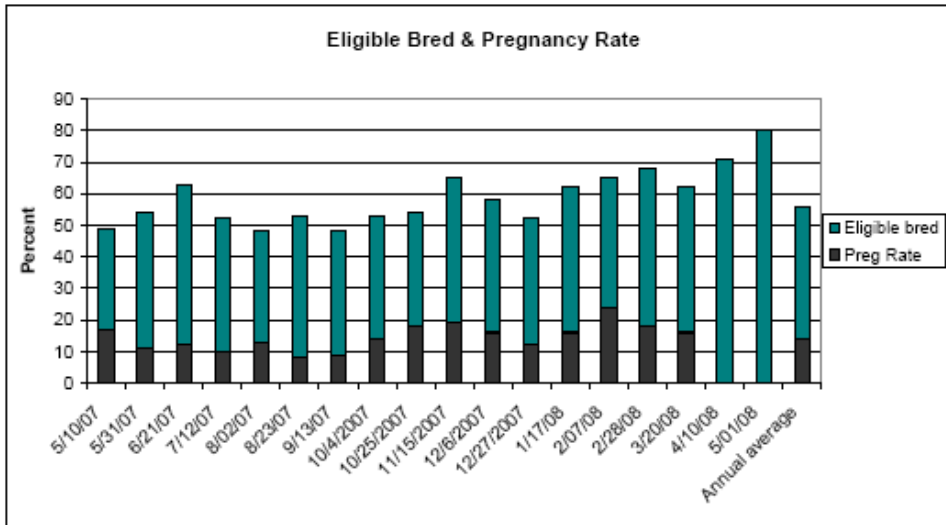
**Whoa!! Where did this number come from?**

Industry Milking Herd 21 Day Pregnancy Rate Guidelines			
Annual 21 day pregnancy rates	Very Good 20%	Typical 13%	Profit Draining 8%

Over the past year...	Your herd percent	Your herd number of cows	Profit Opportunity
Your milking herd's pregnancy rate	14%	635	
Estimated reproductive turnover if attain 20% PR	6.9%	44	
Estimated current reproductive turnover	17.0%	108	\$96,200
Estimated RHA milk increase (lbs) if attain 20% PR		242	\$30,700

Note: Itemized Profit Opportunities (turnover and RHA milk increases) in this section are approximations and the sum is not expected to equal the overall Profit Opportunity due to rounding and the use of Net Present Values in calculating the overall Profit Opportunity.

## Your Dairy's Trend...



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## Effect of Pregnancy Rate on Reproductive Turnover

### Cows Pregnant at Each 21 Day Increment at Different Pregnancy Rates

DIM	Pregnancy Rates				
	25%	20%	15%	10%	5%
66	25.0	20.0	15.0	10.0	5.0
87	18.8	16.0	12.8	9.0	4.8
108	14.1	12.8	10.8	8.1	4.5
129	10.5	10.2	9.2	7.3	4.3
150	7.9	8.2	7.8	6.6	4.1
171	5.9	6.6	6.7	5.9	3.9
192	4.4	5.2	5.7	5.3	3.7
213	3.3	4.2	4.8	4.8	3.5
234	2.5	3.4	4.1	4.3	3.3
255	1.9	2.7	3.5	3.9	3.2
276	1.4	2.1	3.0	3.5	3.0
297	1.1	1.7	2.5	3.1	2.8
Open Cows Culled	3.2	6.9	14.2	28.2	54.0

What was  
 80<sup>th</sup>  
 percentile  
 turnover for  
 herds >500  
 cows?

A herd with a 20% Pregnancy Rate (PR) can replace 23% of their herd for reasons other than reproduction and stay under 30% turnover. A 10% PR herd can not do this.



The DIM column is the midpoint of each 21 day cycle. For example, 66 days in milk is the mid-point of a 21 day cycle starting at 55 DIM which is the assumed voluntary waiting period (VWP). Reading down the chart, 100 cows are eligible to be bred at the 66 DIM cycle. With a 25% pregnancy rate, 25 become pregnant in the first 21 day cycle leaving 75 eligible cows for the next 21 day cycle in which 18.8 (0.25 X 75) are pregnant. At the end of the 297 day cycle, 3.2 cows (3.2%) are still open and will be culled. With a 5% pregnancy rate, 54% of the cows will be culled for reproductive failure.

The following assumptions are made in using this chart...

The VWP is 55 days

All open cows after 308 DIM are culled - based on the following research...

**Survey of Management Practices on Reproductive Performance  
of Dairy Cattle on Large US Commercial Farms**

D. Z. Caraviello,\* K. A. Weigel,\*<sup>1</sup> P. M. Fricke,\* M. C. Wiltbank,\* M. J. Florent,\* N. B. Cook,†  
K. V. Nordlund,† N. R. Zwald,‡ and C. L. Rawson‡

\*Department of Dairy Science, and

†School of Veterinary Medicine, University of Wisconsin, Madison 53706

‡Alta Genetics, Inc., Watertown, WI 53094

J. Dairy Sci © American Dairy Science Association, 2006.

Survey of Management Practices on Reproductive Performance  
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J. Dairy Sci. 89:4723-4735

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# How about milk loss due to poor reproductive performance?

Calculations...

<17 K RHA

17-21 K RHA

21-25 K RHA

25-30 K RHA

>30K RHA

User inputs milk,  
replacement, cull, calf  
and interest price

- 64% 2nd & > lactation cows, 36% 1<sup>st</sup> lactation
- Value of milk and calf calculated for present lactation and 305 days of subsequent lactation
- Surrogate cows
- Adjusted using NPV
- Annualized



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# Veerrrry interesting...

## Income at Different Conception Days (25-30,000 RHA)

DIM Pregnant	Total Days	Per Day	Annualized
66	652	\$ 15.62	\$5,700
87	673	\$ 15.45	\$5,641
108	694	\$ 15.29	\$5,581
129	715	\$ 15.13	\$5,521
150	736	\$ 14.96	\$5,461
171	757	\$ 14.80	\$5,401
192	778	\$ 14.63	\$5,342
213	799	\$ 14.47	\$5,283
234	820	\$ 14.32	\$5,225
255	841	\$ 14.16	\$5,170
276	862	\$ 14.01	\$5,115
297	883	\$ 13.87	\$5,062
Open Cows Culled	644	\$ 14.83	\$4,019

Same trend regardless of production level.



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# Details

## Inputs

Replacement cost	\$	2,100
Cull cow price	\$	700
Calf value	\$	650
Milk Price/pound	\$	0.185
Interest Rate		0.079



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# So...

- We don't care what your VWP is
- For the model to work, everything is converted to a VWP of 55 days
- If your VWP is 80 days and we convert it to 55, watch your Pregnancy Rate drop from 21% to 17%
- All Pregnancy Rates are not equal!

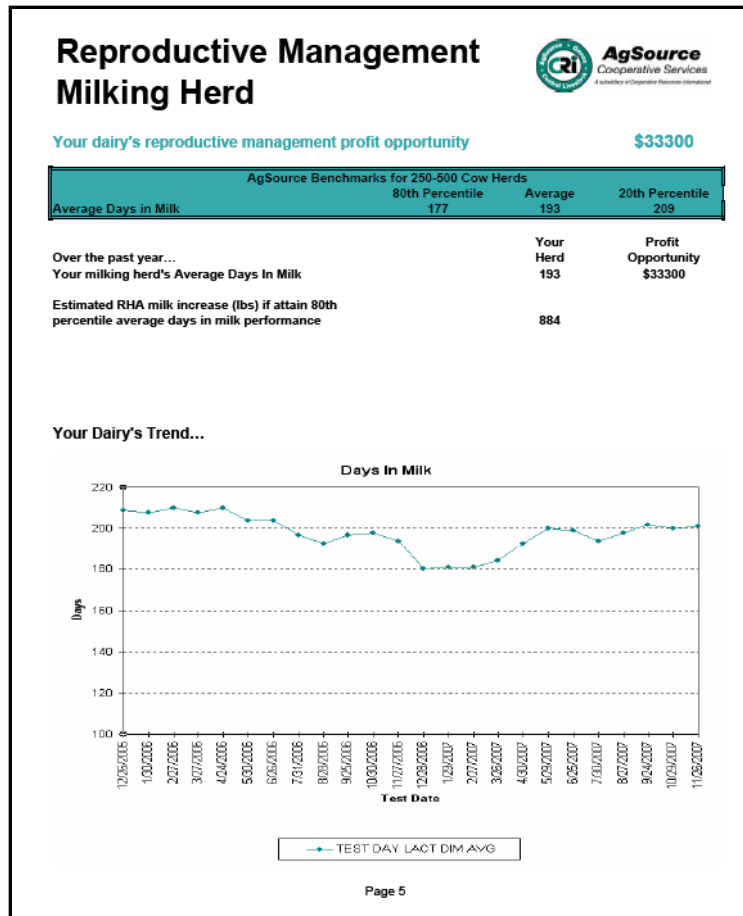
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Open Cows Culled	3.2	6.9	14.2	28.2	54.0



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# If we don't have reproductive data...



We use “Average Days In Milk” as our reproductive performance measure



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# Heifers Age at First Calving Management



Your dairy's heifer reproductive management profit opportunity

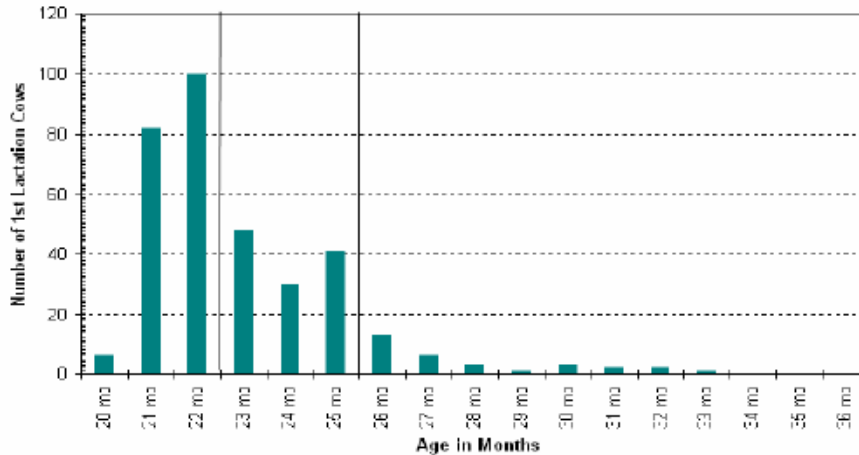
**\$18,900**

AgSource Benchmarks for Herds Over 500 Cows				
	80th Percentile	Average	20th Percentile	
Percent Heifers Freshening <23 Months Old	5%	24%	41%	
Percent Heifers Freshening >25 Months Old	7%	19%	26%	

Over the past year...	Your herd percent	Your herd No. of hfrs. over 80th percentile	Profit Opportunity
Heifers freshening <23 months old	58%	180	\$18,400
Heifers freshening >25 months old	9%	5	\$500
Estimated RHA milk increase (lbs) if attain 80th percentile heifer age at first calving performance		136	

## Your dairy's trend...

Age at First Calving Distribution



We don't use averages!

Revenue Opportunities Based On the Following Research:  
 Impact of Age at Calving on Lactation, Reproduction, Health, and Income in First-Parity Holsteins on Commercial Farms, J.F. Etma and J.E.P. Santos, Veterinary Medicine Teaching and Research Center, University of California-Davis  
 J. Dairy Sci. 87:2730-2742  
 American Dairy Science Association, 2004.



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# Udder Health Management



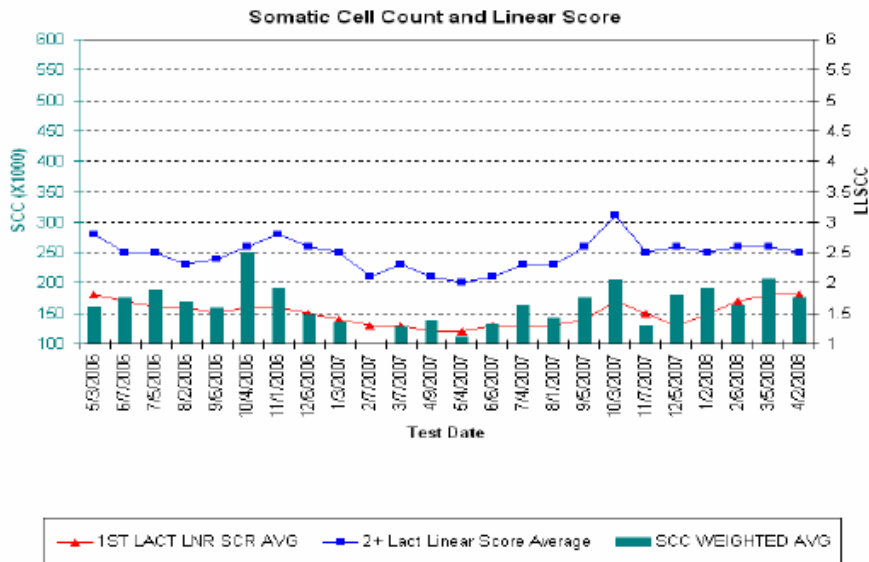
Your dairy's udder health management profit opportunity

\$0

AgSource Benchmarks for Herds Over 500 Cows			
	80th Percentile	Average	20th Percentile
Linear Score, First Lactation	1.9	2.3	2.7
Linear Score, Second Lactation	2.6	3	3.4
Weighted Average Somatic Cell Count	185	262	323

	Your herd	Profit Opportunity
Over the past year...		
Linear score (1st Lactation)	1.4	\$0
Linear score (2nd lactation and greater)	2.4	\$0
Weighted average SCC (000s)	162	\$0
Estimated RHA milk increase (lbs) if attain 80th percentile linear score performance	0	

Your dairy's trend...



Profit opportunities calculated on Wtd. SCC and LSCR

Converting a herd's Wtd. Average SCC to LSCR does not work!



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# Udder Health Management



Your Dairy's Udder Health Management Revenue Opportunity

\$27,000

Expected Revenue Increase From Lowering Linear Score to 80th Percentile (This revenue will come from increased production)

\$0

Expected Revenue Increase From Lowering Weighted SCC to 80th Percentile (This revenue will come from increased premiums)

\$27,000

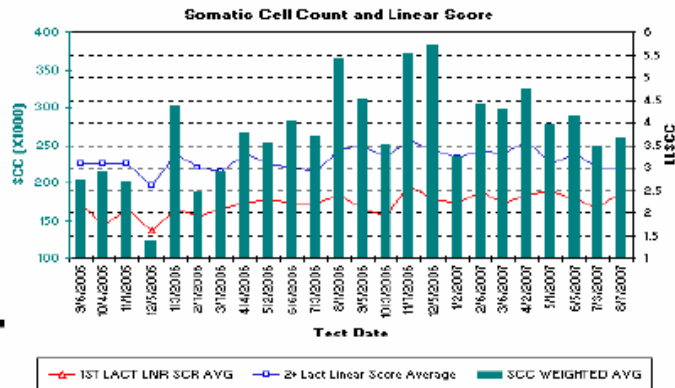
Interesting example

AgSource Benchmarks for 250-500 Cow Herds			
	80th Percentile	Average	20th Percentile
Linear Score, First Lactation	2.3	2.8	3.1
Linear Score, Second Lactation	2.6	3	3.5
Weighted Average Somatic Cell Count	174	257	324

Your Dairy's 12 Month Linear Score (1st Lactation) 2  
 Your Dairy's 12 Month Linear Score (2nd Lactation and Greater) 2.5  
 Your Dairy's 12 Month Weighted Average Somatic Cell Count (000s) 295

Average Annual Milk Gain Per 1.0 LSCR Drop Pounds Per Cow  
 First Lactation Cows 275  
 Second and Greater Lactation Cows 585

Your dairy's trend...



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# Transition Cow & Dry Period Length Management



Fresh cow and dry period length management profit opportunity\*

\$370,500

AgSource Benchmarks for Herds Over 500 Cows			
	80th Percentile	Average	20th Percentile
Transition Cow Indexes	241	-271	-910
Percent of Herd Having <30 Day Dry Period	2%	6%	7%
Percent of Herd Having 70-90 Day Dry Periods	4%	8%	11%
Percent of Herd Having >90 Day Dry Period	3%	8%	11%

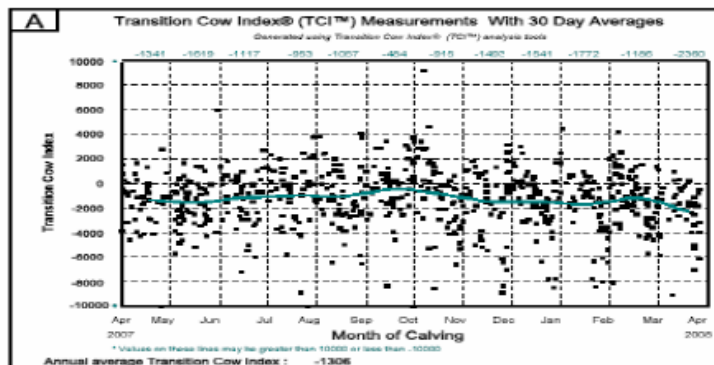
Over the past year...	Your herd TCI	Potential Change	Profit Opportunity
Transition Cow Index	-1306		
Increased production (RHA lbs/cow)		1500	\$274,400
Decreased turnover (Percent)		4.1%	\$60,300

\*The Transition Cow Index's economic impact is likely underestimated since TCIs are not calculated for first lactation cows; however the opportunities found in the mature cow TCI probably apply to the first lactation cows as well.  
 Dry Period Length Management

Over the past year...	Your herd percent	No. cows over 80th percentile	Profit Opportunity
Dry periods, <30 days	8.8%	65.6	\$30,900
Dry periods 70-90 days	4.3%	3.2	\$2,100
Dry periods > 90 days	3.3%	2.9	\$2,800

Dry period management, increased production (RHA/cow) 200

Your dairy's trend...



## Transition Cow Index®

- Milk production
- 1.27# milk
- Increased survivability
- 0.00265%

## Dry period length management

"Annual per cow milk loss per dry period" calculated from lifetime production losses reported in "Dry Period Length to Maximize Production Across Adjacent Lactations and Lifetime Production" divided by the quotient of one divided by your herd's annual turnover rate.  
 M. T. Kuhn, J. L. Hutchison, and H. D. Norman  
 Animal Improvements Program Laboratory, Agricultural Research Service, USDA, Beltsville, MD 20705  
 J. Dairy Sci. 89:1713-1722  
 □ American Dairy Science Association, 2006.



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# Genetics Management



Your dairy's genetic management profit opportunity

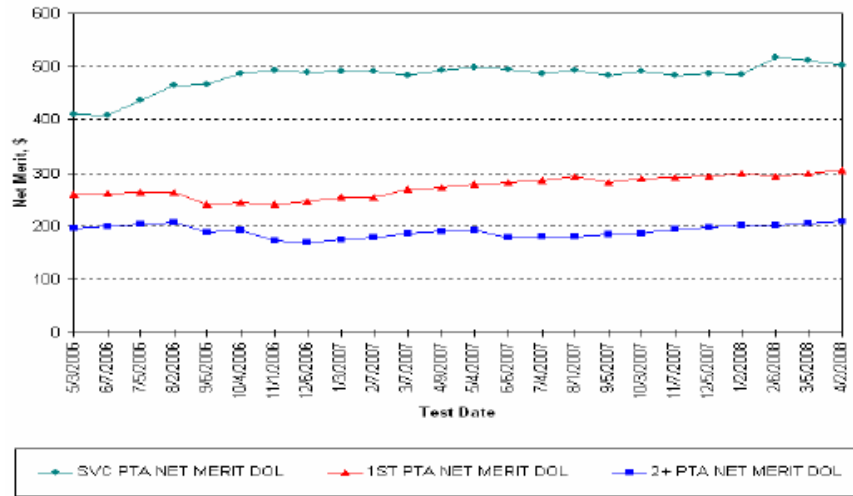
\$0

AgSource Benchmarks for Herds Over 500 Cows			
Milking Herd Net Merit \$	80th Percentile	Average	20th Percentile
	\$187	\$153	\$108

Over the past year...  
 Cows' average sire Net Merit \$ **Your herd** Profit Opportunity  
 \$396 \$0

Estimated pounds per cow RHA milk increase from attaining 80th percentile Net Merit levels 0

Net Merit Trends



Net Merit is a lifetime figure and is adjusted to an annual number here

In February 2007 every unidentified sire went from being a null to getting that breed's unidentified sire's NM\$



# Production Management



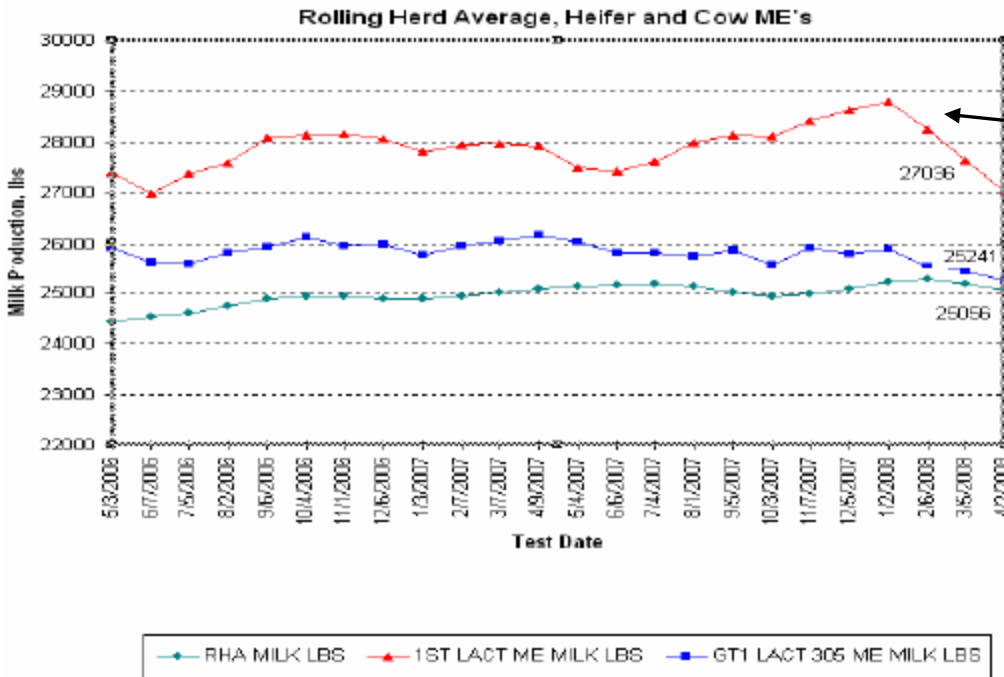
Your dairy's production management profit opportunity

\$622,700

AgSource Benchmarks for Herds Over 500 Cows			
	80th Percentile	Average	20th Percentile
Rolling Herd Average - Milk	28,351	26,034	24,139

Over the past year...  
 Rolling herd average (Milk) **Your herd**  
 25,056

Your dairy's trend...



A treasure trove of information on this page!

Serious money

What happened here?

1<sup>st</sup> lactation cows should be 5-600 lbs above older COWS

This herd's TCI was around the 10<sup>th</sup> percentile. Does that make sense?



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# The details...



## Profit Opportunity and RHA Milk Calculations

### Turnover Management

#### Inputs used:

Replacement price	\$2,000
Cull cow price	\$500
Number of cows in herd	251

#### How Profit Opportunities are calculated

##### Profit Opportunity from lowering turnover

((Number of cows in your herd's turnover - Number of cows turned over if at 80th percentile performance) X (Replacement price - Cull cow price))

$$((88.3 \text{ Cows} - 65.1 \text{ Cows}) \times \$2000 - \$500) = \$34902$$

##### Profit Opportunity from lowering death rate

((Number of cows died - Number of cows died if at 80th percentile performance) X Cull Cow Price)

$$((18 \text{ Cows} - 11 \text{ Cows}) \times \$500) = \$2700$$

If either Profit Opportunity is less than 0, a "0" is entered

Profit Opportunities are rounded to the nearest \$0,X00 in the front pages of this report. In the Calculations section, more detail is provided and less rounding is done.

### Milking herd reproductive management

If all breedings and pregnancy confirmations are not recorded, Average Days In Milk is used as a reproductive measure instead of the more accurate Pregnancy Rate.

#### How Profit Opportunities are calculated

((Rolling Av DIM - 80th percentile DIM) X 0.17 X Number cows X Milk price/pound X 365 days X 0.89 DIM)

$$((193 \text{ DIM} - 177 \text{ DIM}) \times 0.17 \times 251 \text{ Cows} \times \$0.15 \times 365 \text{ days} \times 0.89 \text{ DIM}) = \$33265$$

#### Expected rolling herd average gains from reaching 80th percentile Days In Milk measure

$$((\$33300 / 251 \text{ Cows}) / \$0.15) = 882$$

### Heifers Age at First Calving Management

#### Inputs used:

Increased rearing costs per heifer	
From heifers freshening before they are 23 months old	-\$40.34
From heifers freshening later than 25 months old	\$98.81
(Values obtained from research below)	
Decreased first lactation milk income per heifer	
From heifers freshening before they are 23 months old	\$112.50
(750 pound per lactation loss X Milk price) 750 pound value from research below	
Cumulative losses	
From heifers freshening before they are 23 months old	\$72.16
From heifers freshening later than 25 months old	\$98.81

#### How Profit Opportunities are calculated

((Number of heifers under 23 months at first calving - 80th percentile level of calvings under 23 months) X Cumulative per heifer loss from freshening at less than 23 months)

$$((183 \text{ Cows} - 4.5 \text{ Cows}) \times \$72) = \$12884$$

((Number of heifers over 25 months at first calving - 80th percentile level of calvings over 25 months) X Cumulative per heifer loss from freshening at more than 25 months)

$$((54 \text{ Cows} - 53.4 \text{ Cows}) \times \$98.81 \text{ per cow}) = \$59$$

The Profit Opportunities are summed for a cumulative value.

$$\$12884 + \$59 = \$12943$$

#### How RHA Milk per cow increase is calculated

((Number of Heifers < 23 months old at first calving - 80th percentile level of calvings under 23 months) X 250 pounds milk lost per heifer / total number of cows in the herd)

$$(((183 \text{ Cows} - 4 \text{ Cows}) \times 750 \text{ Pounds per cow}) / 251 \text{ Cows}) = 534$$

#### Revenue Opportunities Based On the Following Research:

Impact of Age at Calving on Lactation, Reproduction, Health, and Income in First-Parity Holsteins on Commercial Farms. J.F. Ettna and J.E.P. Santos, Veterinary Medicine Teaching and Research Center, University of California-Davis

J. Dairy Sci. 87:2730-2742  
American Dairy Science Association, 2004.

#### Udder Health Management

##### How Profit Opportunities are calculated

Linear score losses	
Average annual milk gain per 1.0 LSCR drop	Pounds per cow
First Lactation Cows	275
Second and Greater Lactation Cows	585

##### Milk production losses

((Your herd's LSCR - 80th percentile herd's LSCR) X Average pounds of milk lost in a lactation per 1.0 change in LSCR) X Milk price per pound X Number of cows in lactation group) = Dollar loss

##### 1st Lactation

Your dairy exceeds 80th percentile peer group level performance. This is not a high priority revenue opportunity area for you.

##### 2nd and Greater Lactation

$$((2.5 \text{ LSCR units} - 2.5 \text{ LSCR units}) \times 585 \text{ Pounds/LSCR unit} \times \$0.15 \times 614 \text{ Cows}) = \$37715$$

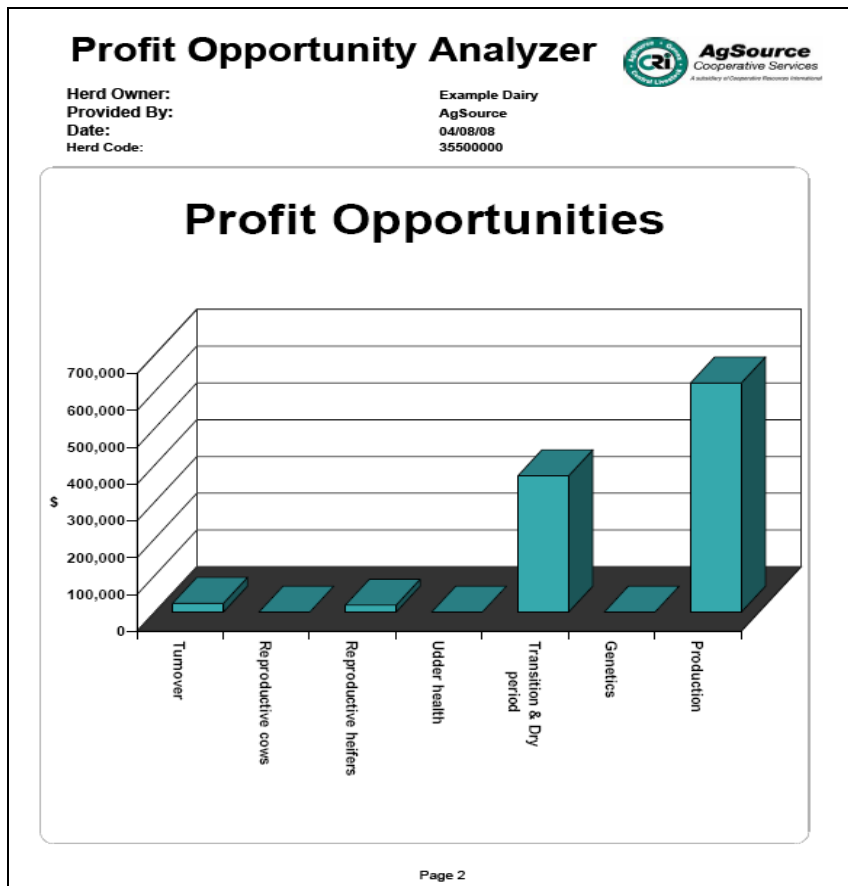
All equations are provided, the herd's own values are shown in the calculations and pertinent research is identified



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# So, how do we use this thing?



- Where do you start?



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# Steps to Problem Resolution...

1. Recognize that there is a problem
2. Quantify the problem
3. Devise a solution/plan
4. Implement the solution/plan
5. Monitor progress – re-evaluate if necessary



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What I hear from consultants, “I knew there was a problem in the milking, but I could never get their (client’s) attention until I showed them this report.”



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# AgSource can identify opportunity areas, but we can't...

- Evaluate if reaching 80<sup>th</sup> percentile performance is profitable
- Evaluate if reaching 80<sup>th</sup> percentile performance is achievable
- Identify what the problem is
- Develop and implement a plan



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# What the Profit Opportunity Analyzer can do for you...

- Make you more than just “the feed guy/gal” or “the vet”
- Makes you part of the management team
  - Ability to affect the real issues on a dairy
- Draws you closer to your customer
- Makes price (service or product) less of a factor in their (client) buying decision



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# How AgSource members use the Profit Opportunity Analyzer...

- Identify bottlenecks and focus their efforts
- At team meetings, gives everyone a standard set of information – all can then focus on solutions
- As centerpiece of financing proposals to lenders



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# Big contributors...

- Kent Weigel, PhD, UWEX
- Ron Visser - Genex
- Ken Nordlund, DVM - UWSVM
- Dick LaCroix - AgSource
- Pete Giacomini - AgSource
- AgSource Board of Directors



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# Questions?



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