



Identifying Bottlenecks in On-Farm Labor Efficiency and Practical Approach's for Improvement

Jason Karszes
PRO-DAIRY

The Impact of Labor

- The 2nd largest expense on farms
- Increasing at a faster rate
- Impact of labor effectiveness on
 - Output
 - Other input costs
- Impact on earnings

Recent Labor Trends – DFBS*
Same 126 Farms, New York State, 2012 – 2017

	2012	2013	2014	2015	2016	2017
Cows per Worker Equivalent	44.0	44.7	44.3	44.7	46.2	47.1
Milk Sold per Worker Equivalent	1,125,158	1,153,603	1,137,565	1,150,132	1,213,885	1,226,154
Labor Cost per Hired Worker Equivalent	\$36,995	\$38,101	\$38,795	\$40,070	\$40,685	\$42,550
Hired Labor Cost per Cwt.	\$2.78	\$2.79	\$2.92	\$2.99	\$2.88	\$2.99
Hired Labor Costs as % of Total Farm Operating Costs	14.8%	14.3%	14.4%	15.7%	16.7%	16.9%

- Dairy Farms Business Summary and Analysis Project, Cornell University
- Prepared by: Jason Karszes, Senior Extension Associate, PRO-DAIRY

Today's Topics

- Strategies to impact labor efficiency
- Labor allocation – where are the labor hours going?
- Labor efficiency by area – where may the potential be to change labor efficiency
- Approaches to change labor efficiency

Strategies to Impact Labor Efficiency

- First point – maintain or improve quality and quantity of output
 - Don't want to sacrifice much, if any, output or quality to improve labor efficiency
- Tools to change labor efficiency
 - Capital investment
 - Lean systems
 - Human resource management
 - Custom services
 - Joint venture/collaboration
- What is the potential for each to impact hours used?
- What is potential impact on both revenue and costs if utilize a certain approach?

Labor Allocation

- First step – where are all the labor hours going on the farm?
- How many different areas and tasks are being performed?
- Can a baseline be set?
 - By area?
 - By activity within that area?
- How do you manage something if you are not measuring it?

Labor Allocation

- Study during summer of 2016
- Labor hours allocated to:
 - 8 different management areas
 - 54 different activities
- Efficiency measures calculated for the different management areas
- 36 Farms participated

Labor Allocation Report: Percent and Ranges

Average, 36 Farms, Summer 2016

Labor Allocation by Primary Category	Worker Equivalents	Percent of Total	80 Percent Range		
			Average	10% Decile	90% Decile
Dairy Herd Total	19.0	74.5%	74	55	98
Mature Herd	16.0	62.8%	90	65	122
Pre-Weaned Heifers	1.6	6.4%	15	3	29
Post-Weaned Heifers	1.4	5.3%	96	36	174
Animals per Worker					
Total Crop Hours	1.9	7.1%	2,436	800	3,994
Hay/Haylage	0.8	2.9%	2,418	753	4,055
Corn Silage/Grain	1.0	3.7%	1,730	787	3,218
1,000 Gallons per Worker					
Manure Handling	1.0	3.6%	35,154	7,013	50,720
Cows per Worker					
Shop & Maintenance	1.9	6.8%	1,261	286	2,997
Management & Office	1.8	7.4%	1,657	338	13,353
Total	25.5	100.0%	55.9	40	74

*Howlett & Karszes, Activity Analysis Project, PRO-DAIRY, Department of Animals Science, Cornell University, Un-Published

Identifying Your Bottlenecks

- Start with one area
 - The biggest labor area – milking center?
 - The area that you think takes the most labor for what is actually done
- Measure it!
 - How many hours of labor are being utilized?
 - May take days or weeks to come up with a good number
 - What is the total hours for the time frame?
- Calculate benchmark
 - Put on to a per unit basis
 - Can measure again in same manger in the future
 - Can potentially compare to industry benchmarks

Identifying Your Bottlenecks

- What quality or value created measures are associated with the activity?
 - Growth rates?
 - Milk quality?
 - Pregnancy rate?
 - Repair of a repair?
 - Costs saved?
- Don't want to sacrifice much, if any, quality or value created to improve labor efficiency

Identifying Your Bottlenecks

- Move on to the next area
 - The next biggest
 - The next that might have the most opportunity
 - The area where there might be a manager to assist
- Build an allocation of where labor is going
 - Process might help identify areas for potential improvements

Mature Herd

Mature Herd, Cows per Hour*	Average	Bottom 10%	Top10%	Range
Milking	17.4	11.8	23.0	11.1
Cleaning	4.8	0.9	9.4	8.5
Bedding	0.8	0.4	1.5	1.2
Bedding Prep	0.1	0.0	0.3	0.3
Paid Breaks/Lunch	0.9	0.0	2.9	2.9
Herd Management	4.9	1.9	8.4	6.6
Breeding/Repro	1.0	0.4	2.6	2.2
Feeding	2.9	1.7	4.5	2.8
Hoof Care	0.5	0.1	1.3	1.2
Other	0.5	0.0	2.1	2.1
Total, Cows per Labor Hour	33.7	23.6	40.6	17.0

*Total Annual Hours/Average Milking & Dry Cows

Labor Allocation Study, 28 Farms, Summer 2016, Un-Published,
Howlett & Karszes, PRO-DAIRY, Department of Animals Science, Cornell University



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Pre-Weaned Heifers

Pre-Weaned, Heifers per Hour	Average	Bottom 10%	Top10%	Range
Feeding	28.8	4.9	64.5	59.6
Bedding	176.5	44.1	420.0	375.9
Cleaning	200.5	25.4	703.6	678.2
Herd Management	157.1	26.8	406.4	379.5
Other	77.9	0.0	246.6	246.6
Total, Pre-Weaned Heifers/Hour	15.2	3.6	29.2	25.7

*Daily Weighted Hours/Number of Heifers

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Post-Weaned Heifers

Post-Weaned, Heifers per Hour	Average	Bottom 10%	Top10%	Range
Feeding	537	62	866	804
Bedding	2,295	146	8,521	8,375
Cleaning	1,843	113	3,514	3,401
Herd Management	997	122	3,366	3,244
Other	1,042	0	3,535	3,535
Total, Post-Weaned Heifers/Hour	148	35	398	363

*Daily Weighted Hours/Number of Heifers

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Hay Acres

Hay Crop Acres per Hour*	Average	Bottom 10%	Top10%	Range
Preparing	11.0	1.8	25.3	23.5
Harvest	1.2	0.3	3.3	3.1
Covering Bunks	25.3	7.2	70.5	63.3
Stacking/Storing Hay	36.3	0.0	128.2	128.2
Custom: Prep Work	6.7	0.0	0.0	0.0
Custom: Harvest	0.2	0.0	1.0	1.0
Total Hay Acres per Hour	1.0	0.3	3.0	2.7

*Total Hay Acres/Total Annual Hours

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Corn Acres

Corn Crop Acres per Hour*	Average	Bottom 10%	Top10%	Range
Spring Season	2.1	0.6	4.6	3.9
Fall Season	1.0	0.5	1.7	1.2
Covering Bunks	28.1	6.7	76.8	70.1
Custom Work: Spring	16.0	0.0	10.5	10.5
Custom Work: Fall	9.0	0.0	12.8	12.8
Total Corn Acres per Hour	0.6	0.3	0.9	0.6

*Total Corn Acres/Total Annual Hours



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Manure Handling

Manure Handling Gallons per Hour*	Average	Bottom 10%	Top10%	Range
Spreading	16,287	4,804	34,808	30,004
Pumping/Injecting	29,993	0	79,614	79,614
Manure Treatment	3,846	0	19,915	19,915
Moving Manure	76,885	0	276,277	276,277
Other	43,961	0	151,095	151,095
Total Gallons Spread per Hour	8,104	2,588	16,267	13,679

*Total Manure Gallons Spread/Total Annual Hours



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Shop – By Cow

Cows per Shop Labor Hour*	Average	Bottom 10%	Top10%	Range
Dairy Equipment	6.6	0.6	22.5	21.9
Crop Equipment	11.4	0.0	4.2	4.2
Manure Equipment	8.6	0.4	21.1	20.7
Facility Maintenance	2.8	0.5	6.9	6.4
Pumping/Injecting	5.1	0.3	14.3	14.0
Total Repair/Main	0.5	0.1	1.3	1.2
Parts run	11.2	1.4	29.4	28.0
Record Keeping	15.9	0.0	57.3	57.3
Other	5.1	0.0	23.7	23.7
Total Cows per Shop Labor Hour	0.4	0.1	1.1	1.0

*Average Milking and Dry Cows/Total Shop Annual Hours



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Shop – Per Acre

Acres per Shop Labor Hour*	Average	Bottom 10%	Top10%	Range
Dairy Equipment	12.9	0.9	49.5	48.6
Crop Equipment	9.3	0.0	7.8	7.8
Manure Equipment	15.6	0.0	45.2	45.2
Facility Maintenance	5.7	0.7	15.1	14.4
Pumping/Injecting	8.2	0.0	30.2	30.2
Total Repair/Main	1.0	0.2	2.8	2.6
Parts run	20.0	0.6	57.7	57.1
Record Keeping	30.5	0.0	133.0	133.0
Other	9.8	0.0	57.6	57.6
Total Acres per Shop Labor Hour	0.8	0.2	2.0	1.8

*Total Crop Acres/Total Shop Annual Hours



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Potential Solutions to Bottlenecks

- Once you identified a bottleneck – now what?
- A series of management steps to move thru
 - Observe
 - Ask
 - Human resource management
 - Lean System tools
 - Invest
 - Custom services
 - Joint venture/collaboration

Improving Labor Efficiency

- Two Ways
 - Increase output per labor hour
 - Keeping the same number of hours
 - Spreading hours over more output
 - Decrease number of labor hours
 - Use less labor hours to perform tasks
 - Do less tasks
 - Dividing same output by less hours.
- If maintaining output, focus would be on decreasing labor hours
- If increasing output, focus would be on increasing output per labor hour

Improving Labor Efficiency – Changing Hours

- Run faster
 - Take more steps, process more, drive faster within the same timeframe
 - How long can this be done?
 - Point of diminishing returns
- Waste less
 - Run same speed as before
 - Waste less steps
 - How much improvement can there be?
- Combination of both

First Step: Observe

- What is taking place each day
- Watch steps, processes, organization, etc.
- Use a camera
- Can more steps be taken(faster) and be sustainable?
- How many wasted steps(minutes) are there?
- Identify potential areas to address in the specific activity or management area

Second Step: Ask

- If have multiple people involved in the area, ask for their input
- What thoughts may they have on how things could be improved
- Involving them in the process
- If making changes and they are involved in the process, is there increased acceptance, agreement, excitement?
- Human resource management

Third Step: Human Resource Management Efforts

- Hiring
- Scheduling
- Training
- Evaluations
- Accountability
- Culture
- Resources: Materials in proceedings from other sessions focusing on Human Resource Management

Fourth Step: Lean System Tools

- Can efficiency and effectiveness be improved by working on the following:
 - Standard operating procedures
 - Organization
 - Clean
 - Tracking and accountability
 - Continuous improvement
- Are there things being done that just don't need to be done?
- Can the speed be increased?
- Can less effort be wasted?
- Reference: Lean Systems Presentation in conference materials

Fifth Step: Invest

- Investing in machinery, equipment, and facilities can improve labor efficiency thru two approaches.
 - Allow the labor get more done with same labor hour
 - Replace labor hours entirely
- Improving labor output
 - Tends to be less investment
 - Allows current staff to do more
- Replacing labor hours
 - Tends to be higher investment
 - Changes labor needs and requirements

Fifth Step: Invest

- Financial analysis is critical
- Is there enough change in labor costs, output, and quality to offset the increased costs associated with the capital investment?
- “DIRTI” five
- While there maybe equipment, machinery, or facilities that can reduce labor significantly, it may still be cheaper to utilize hired labor

Sixth Step: Custom Services

- Should you do the activity at all?
 - Can it actually be improved economically?
- Along with labor savings, is there other potential areas that are improved by utilizing custom services?
 - Increased quality?
 - Increased output?
 - Decreasing other input costs?
 - Capital investment?
- Financial analysis critical in determining benefit of using custom services

Seventh Step: Joint Venture/Collaboration

- Can labor be utilized more effectively?
- Can capital investment be utilized more effectively?
- Can we work with someone else in some manner to achieve higher efficiency in:
 - Labor
 - Costs
 - Capital
- Can quality and volume of output be improved?
- Financial analysis again important in analyzing

Summary

- No golden pill
- Can apply management efforts to improve
- A combination of approaches to make improvements
- Involving everyone associated with area or activity critical to making long-term improvements
- Generally can't sacrifice much, if any, change in quality or output
- If don't measure it, will be more difficult to improve
- Never finished

Questions?

Jason Karszes
jk57@cornell.edu
607-255-3809