



Increasing dairy farm profitability in a changing world of herd demographics

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The number of dairy farms in the United States has seen a steady decrease from 70,375 herds in 2003 to 41,809 in 2016 while the number of dairy cattle has stayed relatively the same or even slightly increased from 9,103,000 milking cows in 2001 to 9,328,000 in 2016. Wisconsin statistics mirror the national statistics. While cow numbers have also stayed the same or slightly increased, milk production per cow has increased at a rapid pace. Average milk production in Wisconsin has increased from 7,793 kg of milk in 2001 to 10,683 kg in 2016. Herd management, animal health, nutrition, technology and genetic improvements have been and continue to be the main drivers of production increases. Following the national and state trends AgSource herd demographics are rapidly changing as well, herds with 500 Holstein cows or higher represented 27% of cows processed in 2007, while in 2017, this percentage has grown to 55%. Managing herd expansion, implementation of new technologies, feeding rations, etc. requires dairy farms to have a reliable and consistent method of measuring performance and benchmark these numbers against previous years or other dairy farms of equal size or production levels for example.

At the beginning of each calendar year AgSource calculates annual benchmarks based on percentile rankings, herd size, production level and cattle breed. Analyzing the change in these benchmarks over time can provide valuable information about how the change in herd demographics are expressing themselves in herd performance data. Information obtained from these benchmarks are incorporated in herd information management services provided back to the AgSource members. The AgSource Profit Opportunity Analyzer (POA) is the premier AgSource herd analysis tool that utilizes the annual benchmarks and expresses management improvement opportunities on a dollar basis. POA benchmarks used for comparison are customized based on the demographics of the herd. To obtain maximum value, a POA is hand delivered and reviewed by the dairy farm management team in consultation with a trained AgSource outreach specialist.

Although milk recording costs represents a small percent of the overall costs of operating a dairy farm, it is important for producers to be reminded what level of return on investment can be obtained. Analyzing various AgSource herd management performance measures shows that from 2015 to 2017, the average AgSource herd increased production on an annual basis by \$40.42/cow, however herds using the majority of herd management reports obtained a \$55.37/cow. Herds using the POA were able to obtain a \$97.23/cow improvement which is significantly higher than all other AgSource herds.

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Summary

Utilizing the data obtained through milk recording to calculate annual benchmarks and expressing differences between a herd with the benchmark as a financial opportunity allows producers of all herd sizes to monitor herd performance and seek opportunities that will increase profitability.

Keywords: profitability, milk recording, demographics.

Introduction

The US Dairy industry has seen rapid changes in the demographics of the dairy industry. The United States Department of Agriculture National Agricultural Statistics Service (USDA-NASS) provides annual data on number of herds, herd size and cow numbers. Figure 1 shows the trend in number of licensed US dairy herds and number of dairy cows by year. In the past 14 years the number of herds has shown a steady decline from over 70,000 herds to now just over 40,000 dairy herds. The number of milking cows has seen some fluctuations but has stayed around 9 million cows with a slight increase in the past 7 years.

Based on this trend, one can question if this has impacted the milk recording industry and how these trends are impacting the services milk recording organizations offer to dairy producers? To answer that question data from AgSource herds was used. Figure 2 shows the change in herd size distribution for AgSource herds comparing 2007 to 2017.

Using the data from Figure 2 and 3, it clearly shows that the herd size distribution has moved towards the larger dairy farms, however the majority of herds (75%) are still less than 200 cows. When reviewing the number of cows processed, the number of cows processed for herds under 200 cows has declined from 52% to 25% and herds over 500 cows now represent 10% of the herds but 55% of the cows that are processed.

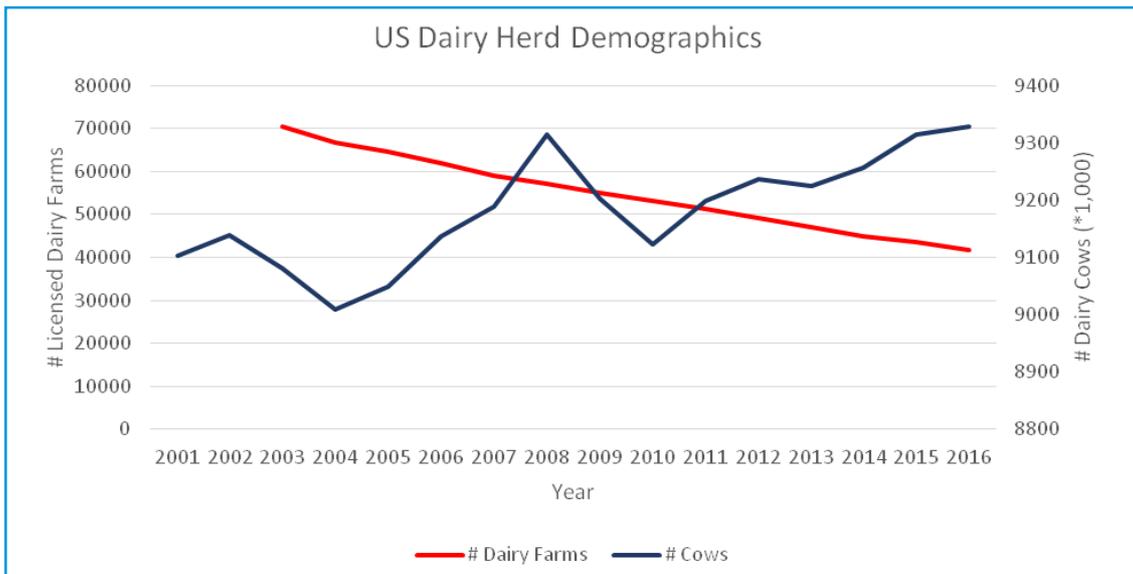


Figure 1. US Herd Demographics (Source: USDA-NASS).

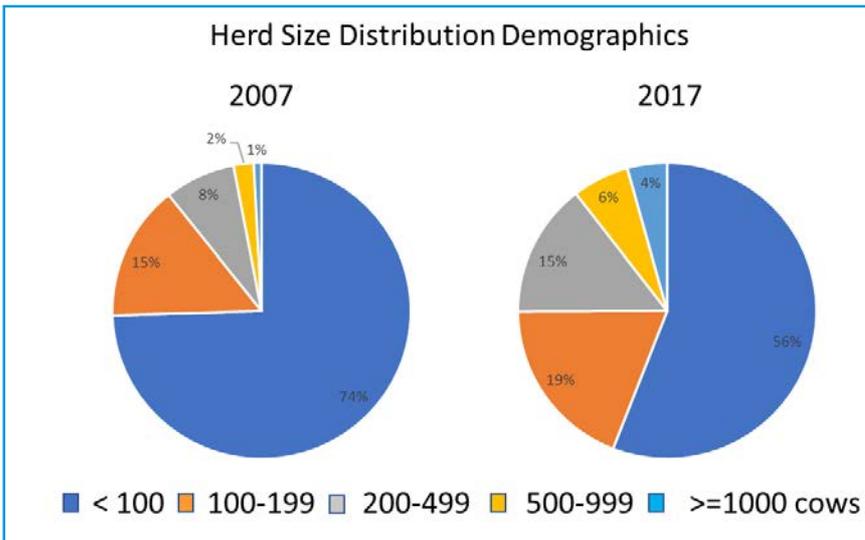


Figure 2. AgSource Herd Size Distribution Demographics 2007-2017.

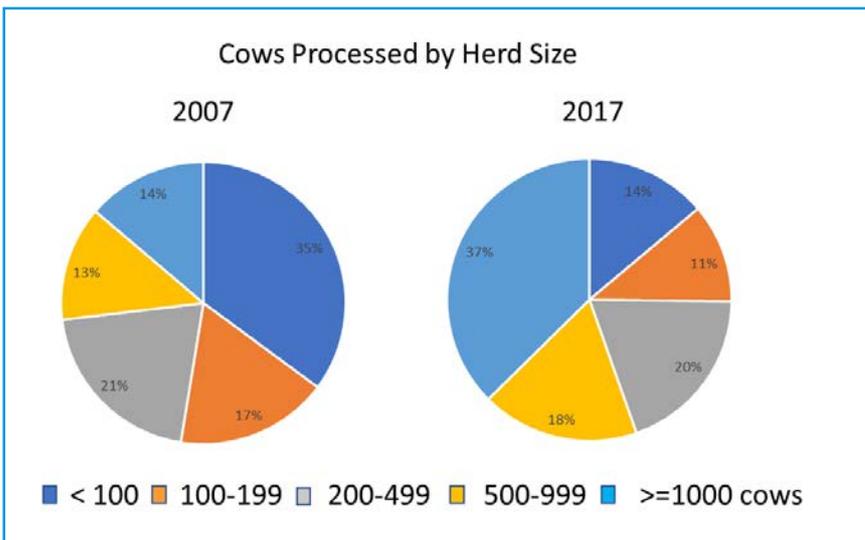


Figure 3. AgSource Cows Processed by Herd Size 2007-2017.

Coinciding with the change in herd demographics, production levels have sharply increased. Figure 4 shows the increase in average annual milk production in kg/cow for the United States and Wisconsin (USDA-NASS Statistics). AgSource 365 day average milk production for Wisconsin herds shows similar trend only at a higher production level compared to all Wisconsin herds.

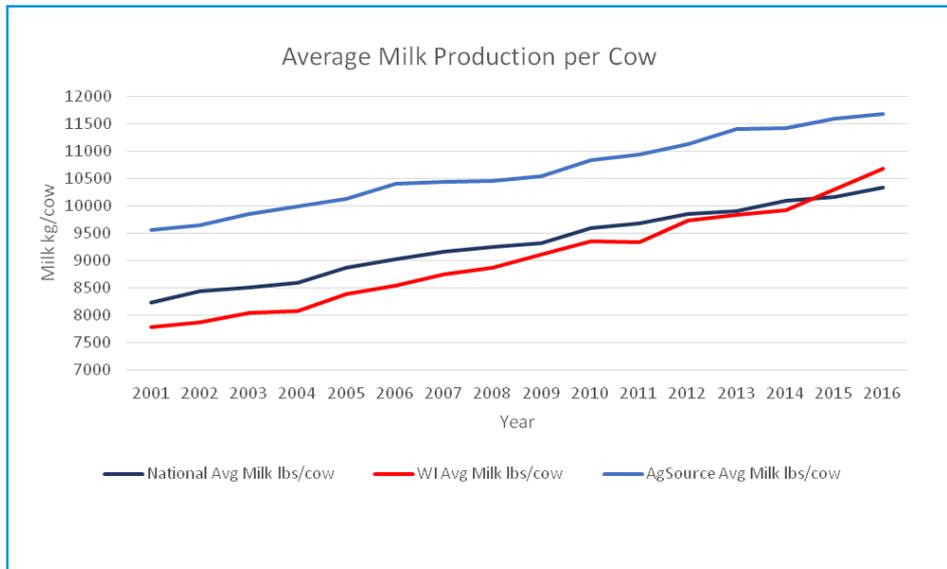


Figure 4. Average Milk Production per cow (Source: USDA-NASS and AgSource).

Key Performance Area Measurements

Since 2012 AgSource has been calculating an annual set of reports that provides summarized values for key performance areas (KPA's). This process is run at the start of each calendar year by taking a snapshot of the past year's performance of the herds that AgSource serviced. Information is summarized based on breed, herd size or production level. Within each of these groups there is a further breakdown showing the top 80th percentile, average or bottom 20th percentile. The herd size and production level statistics are currently only calculated on herds that have Holstein cattle. Depending on the herd size or production level, producers can use these numbers to compare their performance with herds that are of equal size or production level. The overall report uses 114 individual measures broken out into 18 different areas. Table 1 shows an example of the Udder Health KPA's for herds producing greater than 13,608 kg of milk.

One can argue that when a herd finds itself at the top production level they will find little opportunity to make improvements. Considering that changes in herd management or external factors can have a significant positive or negative impact on overall herd performance from year to year, monitoring where a herd ranks can pay dividends and make one aware of possible changes. Another consideration is that as other herds continue to make improvements these KPA's continue to improve over time as well. A herd may be in the 80th percentile but a year later they may learn that peer herds have made more improvements and although the herd's performance is the same, they have slipped down compared to others. An example can be found in how the Udder Health KPA's have changed in a short period of time. In 2012 a herd producing over 13,608 kg of milk would have to be below 144,000 weighted average SCC to be in the 80th percentile, in 2017 a herd would have to have improved udder health and be below 124,000 in order to stay in the same 80th percentile group. This is a 13% improvement in only 5 years.

Table 1. AgSource Udder Health Key Performance area example.

Udder health	80th Percentile	Average	20th Percentile
Weighted average SCC 1	24	178	227
Bulk tank weighted average scc	118	175	214
Percentage of of herd >= 200000 scc	12	16.9	20
Percentage of of herd new infections	6	8.8	11
Percentage of infected cows that are chronic	48	55.1	61
Herd linear score	1.9	2.3	2.6
1st lact linear score	1.6	1.8	2.1
2nd & >lact linear score	2.1	2.5	2.8
Percentage of heifers infected at first test	9	12.9	17
Percentage of fresh cows - new infections	7	12.1	16
1st lact weighted average scc	79	111	136
2nd & >lact weighted average scc	154	226	286
Percentage of dry cows cured	85	77.8	71
Percentage of dry period failure to cure	15	22.3	29

Using the annual KPA's, AgSource developed a product called the Profit Opportunity Analyzer (POA). The POA utilizes the summarized values as benchmarks and expresses the difference between the herd's performance and the peer group selected as a dollar opportunity value. The POA is customized for each herd by using financial information specific to that herd. In addition, the POA is hand delivered and an AgSource representative explains the results to the farm team. Typically the management team may have follow up questions that require digging deeper into the herds data using monthly management reports or using the online reports in MyAgSource. The example below in Figure 5 shows how the KPA values shown in Table 1 were incorporated as benchmarks in the Udder Health Management analysis and how the dairy producer has a \$74,454 opportunity in additional revenue if they can make the improvements that will allow them to perform similar to the top percentile herds.

Turning Key Performance Area data into 9profit opportunities

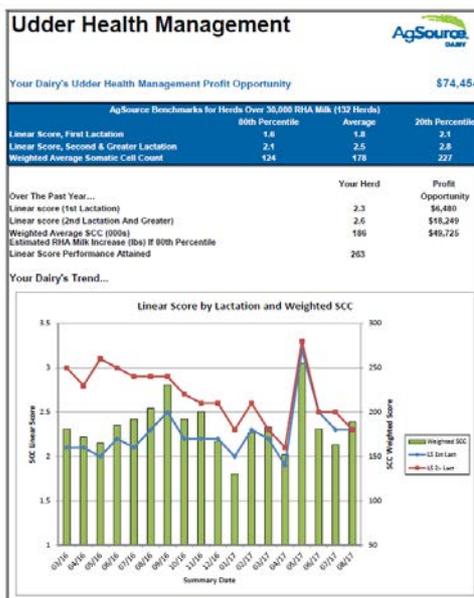


Figure 5. POA Udder Health Management Summary.

Return on investment

As US dairy herds have to face a volatile milk market and deal with increasing costs related to supplies and equipment it is important to realize that participation in the US milk recording program is a choice and organizations such as AgSource need to demonstrate that the informational tools provided to the dairy producers add value and have a positive impact on profitability.

AgSource offers a variety of management tools and dairy producers choose the products they wish to receive. At the basic level, dairy producers only wish to receive cow attention lists and a herd summary report, however on the opposite side of the scale there are dairy producers that want to use the full array of herd management tools that AgSource can offer including the Profit Opportunity Analyzer.

Recently AgSource staff evaluated the benefits that AgSource members are able to receive from utilizing the products and services that AgSource can provide. Benefits were measured as improvements seen over a 3 year period in several key performance areas. Economic values were based on the POA. Since there is no information readily available on herds that do not participate in a milk recording program, the control group that was chosen comprises all AgSource herds. Two groups were defined for comparison, the first group are AgSource herds that use the majority of available herd management reports (or MyAgSource if electronic) and the second group are the herds that utilized the majority or reports and also obtain a POA on an annual basis. Table 2 shows the results.

Based on these results, herds that utilize more AgSource products and services have been able to achieve bigger gains in production and other herd management areas. Herds that use the POA and work closely with the AgSource education and outreach staff made twice the gains the average AgSource herd made over the same three year time span.

Table 2. Annualized overall revenue increase comparison.

Annualized Overall Revenue increase based on production and SCC			
	All Herds	Reports	Reports + POA
Production Improvement	\$40.42	\$55.37	\$97.23
SCC Bonus	-\$0.02	\$0.12	\$0.46
Annualized Improvement by Management Area			
Peak Milk	\$92.08	\$106.75	\$222.17
Udder Health	\$3.04	\$7.28	\$10.49
Reproduction			
Pregnancy Rate	\$4.17	\$6.07	\$13.10
Days Open	\$4.59	\$4.67	\$10.16
Transition	\$5.17	\$6.33	\$29.17
Dry Period	\$3.33	\$3.10	\$7.36
Genetics			
Cow	\$41.67	\$49.00	\$53.67
Service Sire	\$73.67	\$85.67	\$85.33



The US dairy industry will continue to consolidate and herds will continue to get bigger. The adoption of new technologies such as animal monitoring systems, diagnostics and greater use of robotic milking systems will drive the evolution of the traditional milk recording organizations. Inclusion of other data sources with the traditional milk recording systems will further enhance the products and services that milk recording organizations can offer to dairy producers. Tools such as the AgSource Profit Opportunity Analyzer have shown that they can utilize large numbers of individual cow data and turn these into benchmarks and combine with research results and financial data to present comprehensive but easy to understand herd management decision support tools.

Conclusions
