

How to Analyze and Adjust Practices in a Vertically Integrated Production System

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■ Introduction

This discussion is about how to use production/financial records and benchmarking to identify and implement profit enhancing strategies quickly. In the past 18 months, Maple Leaf Agri-Farms utilized Metafarms and Agristats to realize cost savings, production efficiencies and revenues worth an estimated \$1.53 per market hog produced. For our system, this is worth over \$1 million per year. We have really just gotten started. Current initiatives that are well underway may potentially yield an additional \$8 per hog or roughly \$5-\$6 million per year.

Maple Leaf completed the set-up of Metafarms Sow Manager in early 2009. In June 2010, we completed our nursery and finishing set-up. We joined Agristats officially in 2008, but our active use for business benchmarking began in February 2009. We got much more engaged in business optimization efforts using Agristats at the beginning of 2010.

Metafarms gives us detailed, real time data for monitoring, motivating and feedback. Agristats provides perspective and the ability to compare system performance. Most importantly, it gives us the potential to focus efficiently and strategically on the performance issues that are costing us the most.

Our biggest challenge, upon completing the set-up of Metafarms and Agristats, has definitely not been finding improvement opportunities. Setting priorities, communicating performance information effectively and focusing our resources are the big items for us.

■ The Communication Challenge

Large Swine Production systems can be assembled and **financially** controlled. That makes them Vertically Integrated in business structure, but getting production systems to **perform** in a controlled fashion is a much bigger job. It is like assembling 100 people and telling them to dance. They probably all know how to dance but you might start off with 100 uncoordinated individual performances all at the same time. Getting everyone to do the big moves well and all the same is the trick. An efficient production system needs to have 100 dancers performing one dance together. The system is not in control until major profit and productivity parameters are effectively choreographed. How can this be made to happen?

You need to have a message and the means to communicate it efficiently to the production level. Comparing yourself to others (benchmarking) is a very effective way of getting everyone to pay attention. Benchmarking provides performance feedback and swine operations are particularly starved of this. Once people can see how their production results compare with everyone else, the problem solving and improvement ideas begin. Production information is extremely detailed and complex. A focus on simple, effective report design and distribution is critical.

■ Coming up with the Message

Metafarms gives you quick and flexible access to your system production data. You can readily compare your best, average and poorer results. You can also determine what getting everyone to perform at the best result level is worth. This is referred to as “internal benchmarking”. Internal benchmarking is helpful, and most production systems do this. Good reporting systems make this much easier. There is however a risk that by using this approach as the sole performance measure, you could wind up elevating your production only to the level of the “tallest dwarf”. This can happen when we put a lot of effort into becoming very good at something that doesn’t matter financially just because we can measure, compare and influence it easily. Another risk is interpreting our best result as the best possible because we can’t see what other systems are doing. We use Metafarms to provide production detail, internal benchmarking and system performance reports on a weekly basis. It has brought tremendous automation, standardization and organization to our production data. By getting the hard work of organizing and assembling data automated, we have much more time to focus on issues of communication, co-ordination and measurement of performance.

Agristats provides Swine Industry Benchmarking. With this reporting, you can see what the best producers in North America (and Canada specifically) are

doing. Agristats uses a robust, standardized approach. They effectively marry production and financial data together. While the report is historical, its use is strategic (less time sensitive). It takes time and effort to fully understand the information (your own and others) but once you “get it” it is a very powerful tool. We have found that by taking ownership of this information and generating regular reports, we are able to create a powerful sense of urgency. We generate a monthly executive summary and opportunity analysis for broad circulation to our production team and senior management. We also track our progress on initiatives tied to the opportunity analysis and focus improvement efforts on the high value opportunities.

■ **Current Custom Reports for Production Team Communication**

Weekly Sow Performance Report

Metafarms has flexible reporting tools that allow us to summarize large amounts of data from all of our sites in single reports quickly and efficiently. We use this capability to create custom reports. These reports are used by senior management to monitor, compare and contrast individual farm performance and spot trends. Our Barn Managers use the charts to show staff how they are doing and how others are doing. A scoring system has been developed, weighting things like service target accuracy, wean # targeting, wean weight and pigs/inventory sow/yr targets. The scoring allows us to rank farms, creating a healthy level of competitiveness to ensure proper focus and data accuracy. The visibility to other farms’ performance has improved networking and problem-solving between our sites as best practices are sought out. At the system level, we realized that we could establish very smooth production flow by providing fast production feedback and designing incentive plans to reinforce our targets. This helped create significant pig quality, weaning age/weight and performance improvements. Improved reporting capabilities have helped our production team achieve heavier weaned pigs, less mixing of poor quality pigs, less light market hogs and generally improved biological performance.

Weekly Performance Charts

These provide active group performance information in nursery/finish production. We are using Metafarms reporting capabilities to track weekly feed disappearance, mortality and market hog shipping patterns in all our finishing sites. Tracking of feed disappearance compared to our feed budget allows us to assess growth rates and site performance. Use of this reporting has allowed us to identify high feed intake sites and low intake sites and better understand the reasons for this. Changes in feed disappearance have also

been useful in diagnosing sub-clinical health challenges. Weekly mortality reporting has allowed us to fine tune our medication and diagnostics. We can also quickly identify periods of high mortality and look into causes while batches are ongoing. Better records are improving our reaction time, which improves our ability to manage medication use. It is also much easier to see mortality patterns, which vary between pig flows and individual barns. Most important, we have developed the reporting in such a way that the entire service team and management sees this information weekly. This results in a much better handle on current performance without having to wait on close-out data to see how performance is tracking. We can also do more with less travel. We had a mortality tracking system prior to Metafarms, but it was much more time consuming and required double entry of information into our financial program and spreadsheets. We can now generate more comprehensive reporting in 3-4 hours than we could in two days prior to Metafarms.

Monthly Wean Age Report

This report shows the distribution of litter wean ages by farm. Our farms use these reports to optimize weaning age and weight.

Monthly Sow Feed Usage Report

We have customized the feed reporting in Metafarms to compare and contrast sow feed usage month-to-month by farm and between farms to help manage costs. This reporting allows our Barn Managers to quickly determine how their feeding practices compare to their peers at other sites. They can access the detail behind this reporting at any time at the farm through Metafarms.

Monthly Sow Weight and Back fat Report

Sow condition in sow units over time and comparison between sow units at any given point in time is important. This capture of weight and Back fat information is used to manage the feeding program for dry sows in early gestation. The higher level reporting allows management at the barn and nutrition level to more closely monitor the effectiveness of the program. Longer-term, we will be able to compare and contrast productivity and sow feeding practices with this information.

■ Demonstrating the use of Metafarms and Agristats to Analyze and Adjust Practices

Weanling Production Consistency

One of the first things we saw when we began generating the Weekly Sow Performance Report was that our production was quite volatile. Volumes were frequently higher than our nursery capacity could ideally accommodate and this had adverse effects on feeder pig (and downstream market hog quality). In the sow barn, we were finding variable wean weights and age as capacity was being pushed. This led to uneven flow of hogs to market, and more mixed source fills (poorer results). We created a bonus program for the sow barns to help manage wean numbers to create even filling of nursery rooms. We established service target monitoring and used the weekly sow performance report to provide feedback on these factors. We also developed a report to monitor wean age on a monthly basis. This helped us to make wean age more consistent between 17-23 days.

Tables 1-3 are drawn from our Metafarms data from 2007 to 2010. These tables illustrate the results of our efforts to reduce production variation in the Sow barn. **Table 1** shows that in 2007 and 2008, wean numbers on our current (2010) top ranked farms fluctuated about 3.1% above or below their average (COV is Coefficient of Variation, defined as Standard Deviation/Average x 100). In 2010, this variation has been reduced to 2.4%. This means consistency of weekly wean number volume is almost 23% better. In the top farms (1-5) average, we had a 0.9% drop in production volume from 2007. **Table 2** shows changes in wean weight from 2007-2010. COV for wean weight dropped from 3.7% to 1.5%, meaning consistency of weekly wean weights is nearly 60% better. Weights also increased 0.6 kg or 10.6% from 2007 to 2010. **Table 3** shows year over year change in pigs weaned/sow farrowed. This has improved steadily from 2007-2010 with 2010 figures 9.05% better than 2007 for our top five farms and 6.05% better for Maple Leaf overall.

Table 1. Weaned Pigs/week (Metafarms)

Weaned Pigs/Week	2007		2008		2009		2010	
	Average	COV	Average	COV	Average	COV	Average	COV
MLAF ALL*	16906	2.7%	16320	4.5%	15271	2.5%	15228	1.9%
Farm 1	1386	8.6%	1468	6.3%	1380	6.0%	1367	2.7%
Farm 2	558	17.1%	489	18.8%	619	14.0%	676	6.9%
Farm 3	1416	4.1%	1404	4.9%	1347	6.0%	1372	5.0%
Farm 4	1385	6.7%	1415	6.6%	1351	5.9%	1389	3.2%
Farm 5	1476	5.6%	1489	5.9%	1416	6.0%	1362	5.5%
Farms 1-5, Average	6220	3.1%	6265	3.1%	6112	3.8%	6166	2.4%

*MLAF ALL includes a sow barn lost to fire in 2008, reducing 2008-2010 volume

Table 2. Maple Leaf Wean Weights (Metafarms)

Wean weights, kg	2007		2008		2009		2010	
	Average	COV	Average	COV	Average	COV	Average	COV
MLAF ALL	5.71	2.4%	5.78	1.5%	6.10	1.8%	6.22	1.1%
Farm 1	6.18	10.0%	5.73	4.5%	6.26	5.5%	6.24	2.3%
Farm 2	5.69	9.3%	6.37	8.7%	6.17	8.2%	6.36	5.6%
Farm 3	5.31	3.2%	5.62	2.8%	5.88	3.1%	6.13	3.3%
Farm 4	5.38	3.6%	5.76	2.8%	6.28	2.3%	6.50	2.2%
Farm 5	5.71	6.7%	5.77	6.4%	6.35	3.2%	6.02	4.6%
Farms 1-5, Average	5.64	3.7%	5.77	2.9%	6.19	2.4%	6.24	1.5%

Table 3. Maple Leaf Pigs Weaned/Sow Farrowed (Metafarms)

Pigs weaned/ litter	2007		2008		2009		2010	
	Average	YOY*	Average	YOY*	Average	YOY*	Average	YOY*
MLAF ALL	9.43	0.0%	9.66	2.5%	9.91	2.6%	10.04	1.3%
Farm 1	9.16	0.0%	9.94	8.6%	10.46	5.2%	10.56	0.9%
Farm 2	9.16	0.0%	9.49	3.5%	9.11	-3.9%	9.85	8.1%
Farm 3	9.70	0.0%	9.52	-1.8%	10.00	5.0%	10.26	2.6%
Farm 4	9.47	0.0%	9.58	1.2%	9.97	4.0%	10.14	1.8%
Farm 5	9.27	0.0%	9.57	3.3%	10.21	6.6%	10.20	-0.1%
Farms 1-5, Average	9.39	0.0%	9.65	2.8%	10.06	4.3%	10.24	1.8%

*Year over year change

Table 4. Benchmarking Production with Agristats

Measure	June 2008 To May 2009		June 2009 To May 2010		June 2010 To Sept 2010	
	Maple Leaf	Top 25%**	Maple Leaf	Top 25%**	Maple Leaf	Top 25%**
Cull LB, %	1.13	2.42	0.92	1.99	0.93	1.61
Cost of Lights/ Market Hog Sold*	0.91	1.31	0.71	0.94	0.62	0.91
Wean to Finish Mortality, %	7.25	7.99	6.27	7.37	6.50	7.39
Place Weight, lb	59.3	45.0	63.4	47.5	65.6	49.5
Market Wt, lb	262.4	265.4	261.7	268.4	263.6	265.3
Caloric FC (Kcal/lb Gain)	4113	4241	4037	4188	4097	4221
Caloric FC % Adv. Over Top 25%	3.02%		3.61%		2.94%	
Age at Market, d	183.2	190.6	178.1	190.8	179.0	190.3

*This is calculated by taking Top Hog Net return/CWT -Total Revenue/CWT x Mkt Wt

**Agristats Top 25%

Benchmarking to Measure Improvement

These flow consistency changes have made a significant difference in light hog volumes, feeder pig place weights, age at market and wean to finish mortality. **Table 4** compares our results in Agristats for the same approximate age cohorts at market weight as shown in the Metafarms weaned pig data (Table1-3). Maple Leaf data is compared to the North America Top 25% in Agristats for several factors. The most noteworthy are Cost of Lights/Market Hog Sold (calculation derived from Agristats), Wean to Finish Mortality and Age at Market. **Table 5** values the difference in performance compared to the Top 25% in 2008/09, 2009/10 and 2010 (June to September). In combination, the difference between Maple Leaf and the Top 25% improved by \$1.27/Hog sold in 2009/10 compared to the prior year. In the June to September 2010 period, Maple Leaf improved performance by \$0.53/Hog sold compared to 2008/09. For the Maple Leaf system, the June 2009 to May 2010 performance improvement is worth about \$1 million per year. The June 2010 to September 2010 improvement is worth about \$400000 annualized. Comparing our most recent performance to 2008/09 directly (internal benchmarking) would suggest an improvement of \$1.85/Hog produced. The Top 25% improved \$1.32/Hog produced over the same period. Our performance improved by \$1.85/Hog produced, but our competitiveness improved by only \$0.53/Hog produced.

Table 5. Annualized Value of Performance Change/ 100000 Hogs Sold
(compared to top 25% in Agristats)

Measure	2008/09	2009/10	2010
Cost of Lights/Market Hog Sold Diff.	\$40,000	\$23,000	\$29,000
Wean to Finish Mortality Diff. from Top 25%	0.7%	1.1%	0.9%
Value of 1% Wean to Finish Mortality (\$0.93)*	\$68,820	\$102,300	\$82,770
Caloric FC Benefit (Cost) to MLAF**	\$192,642	\$224,661	\$182,706
Age at Market (\$0.15/d facility cost)	\$110,250	\$189,150	\$170,250
Gap (Brackets) or Benefit \$/100000 Hogs	\$411,712	\$539,111	\$464,726
Improvement over 2008/09 for MLAF		\$127,399	\$53,014
Improvement Per Hog Sold for MLAF		\$1.27	\$0.53

*Average of (Weaned pig cost+ Market hog Value) x 1%

**Feed Cost \$0.6928/kg Gain Top 25% June 09-May 10 x MLAF kg gain x %Cal. FC Improvement

Agristats Benchmarking to Increase Revenue and Reduce Costs

We have taken a hard look at numerous other purchasing, sales and contractual arrangements using Agristats. In cooperation with our suppliers and customers, we have been able to significantly improve our revenue and cost structure on the “little things” that fall a bit outside the hog production focus. On these items, we were able to realize improvement worth \$1/Hog sold annually.

In total, we have estimated savings of \$1.53 per market hog compared to our 2008/09 performance against the Top 25% Agristats Benchmark through use of more robust production reporting and benchmarking. For Maple Leaf, these savings represent in excess of \$1 million annually. Note that our 2008/09 “baseline” biological performance actually compares quite favourably to the Top 25%, but that is not all that matters, as we see above. That is one of the key learnings from Agristats.

■ Looking Forward

We are working on much more opportunity but expect it may take another 3-6 months to realize the results. Within our own system, we use a Canadian benchmark comparison to determine opportunity. This represents a much smaller production grouping so to respect their confidentiality these benchmarks are not identified directly below. Most of the opportunity measures you will see in **Table 6** are against this benchmark. In total, we see \$5.33/Market hog of opportunity to reduce costs in the weaned pig and hope to capture an estimated \$4.43/Market Hog. We see finishing feed cost opportunity of \$3.63/Market hog and hope to capture \$4.06/Market Hog. Some of these initiatives are surprising in their potential and some require major system management adjustments. In total, there is an additional \$8.96/Market Hog in opportunity at this time (this changes somewhat each month, depending on our results and the benchmark).

We believe we have a good chance of realizing \$8.50/Market Hog of this. There are companies achieving this today, so there is no doubt that it can be done!

Table 6. Summarized Agristats Opportunity List (August 2010 Book)

Top Opportunities in Agristats	Planned Initiative Potential
1. Weaned, \$5.33/Market Hog	\$4.43
a. Breeding/Gestation Feed Cost/Use	\$1.26
b. Lactation Feed Cost/Use	\$0.51
c. Weaned Pigs/Sow	\$1.46
d. Med & Vacc Sow to Fin	\$1.20
2. Finishing, \$3.63/Market Hog	\$4.06
a. Formulation	\$3.83
b. Purchasing	\$0.23