An Analysis of How Dairy Farmers Divide Their Time among Twelve Key Management Areas and Farm Profitability

Honors Thesis
Presented to the College of Agriculture and Life Sciences, Social Sciences of Cornell University
in Partial Fulfillment of the Requirements for the Research Honors Program

by
Carolyn Marie Braun
May 2012

Dr. Wayne Knoblauch
Abstract

The relationship between the time dairy farm managers spent on twelve key management areas and dairy farm financial performance was analyzed. The twelve key management areas analyzed were (1) milk quality, (2) milk quantity, (3) reproduction, (4) cow comfort, (5) nutrition, (6) reducing the incidence of metabolic disorders, (7) dry cow comfort, (8) calf management, (9) financial records, (10) financial management (11) crop production and (12) human resources management. Studies in the past have analyzed the factors that affect farm financial performance. However, these studies have never looked at the breakdown of manager hours spent on the factors and how that affects profitability.

The data was collected through a survey sent to New York State dairy farmers that participate in the Dairy Farm Business Summary. One limitation of this study, is that only 20 farmers responded. A multiple regression analysis was performed using a best subsets regression to determine the variables to include in the model. A p-value<0.05 was considered significant. The time managers spend on milk quality, milk quantity, reducing the incidence of metabolic disorders and financial management had a negative relationship with net farm income without appreciation. One problem with the model is that endogeneity may be present among the explanatory variables. Time spent on cow comfort, nutrition, dry cow comfort, calf management, financial records and human resources management had a positive impact on net farm income without appreciation. In this study, time spent on reproduction and crop production was not statistically significant and therefore not included in the final model. The results of this study will help dairy farm managers structure the areas they focus on in order to improve farm efficiency which will in turn lead to an increase in financial performance for the farm.
Acknowledgements

I would like to extend my gratitude to numerous people who helped me write my thesis. First I would like to thank my advisor, Dr. Wayne Knoblauch for his help and support throughout the entire process. I would also like to thank Jason Karszes for all of the help and advice he gave me. He took the time out his schedule to discuss my research and without that my thesis would not have been possible. Thank you to Linda Putnam for all of her assistance. Whenever I needed help she was always quick to respond and help me in any way possible. I would also like to thank my family for their support in everything I do.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Literature Review</td>
<td>8</td>
</tr>
<tr>
<td>Successful Dairy Farm Management</td>
<td>8</td>
</tr>
<tr>
<td>The Effect of Managerial Ability on Efficiency</td>
<td>9</td>
</tr>
<tr>
<td>Factors Affecting Dairy Farm Profitability</td>
<td>10</td>
</tr>
<tr>
<td>Methodology</td>
<td>14</td>
</tr>
<tr>
<td>Data Collection</td>
<td>14</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>15</td>
</tr>
<tr>
<td>Results and Discussion</td>
<td>18</td>
</tr>
<tr>
<td>Conclusion</td>
<td>22</td>
</tr>
<tr>
<td>References</td>
<td>24</td>
</tr>
<tr>
<td>Appendix A</td>
<td>26</td>
</tr>
</tbody>
</table>
Introduction

The margin between the input costs to produce milk and the price per cwt will determine future financial stability for dairy farms, thus it is critical that dairy farmers focus on reducing costs (2012). The milk price is extremely volatile; therefore it is necessary that farmers focus on having low costs in order to be able to make a profit at fifteen-dollar milk as well as at twenty-dollar milk. In order to do this, it is imperative that dairy farmers know which management areas are associated with increased profit, so that they can allocate their time efficiently. If there is a strong relationship between time spent on certain managerial areas and farm profitability, dairy farmers will be greatly benefited.

The research done in this area in the past does not specifically address the issue of how time spent on various farm management areas affects profitability. A study by Gloy, Hyde, and LaDue (2002) addresses the effect of dairy farm management on farm profitability; however they do not look at hours spent per week on key managerial areas. The study solely address the effects of financial management, return on assets, production management, milk production per cow, human resources management, age, and education level of operators on farm profitability. J. Clark Fowers (1979) conducted a study on the “Correlation Analysis of Dairy Practices and Management Factors on New York Dairy Farms.” This study performed a simple correlation analysis addressing the relationship between various dairy farm management factors. The results of this study were that an increase in volume (pounds of milk sold and number of cows) has the strongest relationship with productivity and efficiency. A study by Justin Byma and Loren Tauer (2010) concluded that managerial ability influences dairy farm efficiency. Thus, it is necessary to perform a study addressing the variables that affect “managerial ability.” One portion of managerial ability is time management because if farmers are not efficient then they will not be
maximizing profits. Therefore, this study will help define how to improve managerial ability by increasing management efficiency on dairy farms.

This study will differ from those in the past due to the fact that it will focus on the relationship between hours spent per week on different farm management areas and whole farm profitability. The twelve key management areas as identified in this study are (1) milk quality (reducing somatic cell counts, bacteria counts, etc.), (2) milk quantity (increasing pounds of milk produced per cow, etc.), (3) reproduction (heat detection, artificial insemination, heat synchronization programs, etc.), (4) milking cow comfort (stall cleanliness, stall bedding, etc.), (5) nutrition (selecting the ration, preparing the ration, etc.), (6) reducing the incidence of metabolic disorders (observing cows, analyzing milk graphs, etc.), (7) dry cow comfort (observing cows, addressing issues with stalls, etc.), (8) calf management (feeding calves, treating calves, bedding hutches or pens, etc.), (9) financial records (entering inflows and outflows into checkbook or a computer program, payroll, etc.), (10) financial management (review of financial reports, budgeting and forward planning, comparison of actual to budget, income tax management, etc.), (11) crop production (seed, fertilizer, and herbicide selection, etc.), and (12) human resources management (managing labor, etc.). It is necessary for farmers to know not only the benchmark return on assets and pounds of milk sold per worker but also to know the managerial areas that they can implement in order to achieve these benchmarks.

Knowledge of the relationship between the areas dairy farm managers spend their time on and farm profitability will be valuable to many parties. Dairy farmers will be able to use the findings as a guide when determining the most efficient use of their management. If farmers are able to ensure that they are utilizing their management in a way that maximizes profitability they will be greatly benefited in the long run. If milk prices drop as low as 2009 again it is imperative
that dairy farmers have the knowledge as to how they can increase their profits. Knowing how to spend their time focusing on the twelve key managerial areas will allow farmers to effectively combat another sharp decrease in milk price or conversely a decrease in the margin between milk price and feed cost.

Dairy farm consultants will be able to use these results when discussing farm management with other dairy farmers. When consultants meet with dairy farmers one of the areas they address is efficiency on the dairy farm. Efficiency plays a huge role in driving profit maximization on dairy farms; therefore it is important that dairy farmers consider efficiency when making managerial decisions. One way to increase efficiency is for managers to focus their time on the areas that need it most. The results of this study will show which areas are the most strongly correlated to farm profitability. Therefore, consultants will be able to use these results to help dairy farmers increase efficiency by utilizing their management time effectively.
Literature Review

Successful Dairy Farm Management

What makes some dairy farms successful, while others are terminated every day? The answer lies in the capabilities of the farms’ management. Successful dairy farmers focus on ensuring that their business is being productive and generating profits (Peck, 2001). They understand that dairy farming is a people business, thus they focus on improvement and development amongst employees and managers. They take pride in the development of their employees. They understand that in order to improve their farm, it is necessary to have an influx of new personnel with new ideas to take over key management areas. There is a focus on planning for both the present and the future and making these plans known to everyone within the business. However, they are flexible enough to allow for changes within their future plans if the conditions change. Successful dairy farm managers analyze their records often in order to determine if they are producing at the highest level. They also benchmark their performance records against industry standards. They use the information in their records when making decisions.

Managerial ability can be used to explain variability amongst farms that operate in similar environments (Rougoor, Trip, Renkema, 1998). The term managerial ability entails how a manager uses the resources available to them to make decisions in order to achieve their specified goals. Farm performance differences may be due to different skills and personality traits among farm managers. Farm managers that have a drive to succeed, are highly motivated, intelligent and have a lot of dairy farm experience are expected to perform better than those that do not. However, in order for a farmer with favorable personality traits and many skills and experiences to be successful it is necessary that they are also skilled at decision-making. There
are many stochastic elements that cause uncertainty in dairy farm performance. Thus, managers have the difficult task of making decisions in order to achieve an outcome that is unpredictable and risky. Thus, even managers with the right qualities to be successful often fail due to uncontrollable circumstances.

The Effect of Managerial Ability on Efficiency

In order for dairy farms to be profitable they need to operate efficiently. Efficiency relates to the overall productivity of the dairy farm (Lund & Hill, 1979). In order to measure efficiency, it is necessary to take into account all inputs that determine an output. It is critical to analyze efficiency in this manner because using a measurement that does not take into account all inputs of production will give a biased result.

Efficient dairy farms often have lower costs of production than inefficient dairy farms (Mosheim & Lovell, 2009). However, there have been results in studies that show that efficiency only increases with cow numbers to a certain point, and then increasing herd size actually leads to a decrease in efficiency. It has also been shown that long-run average costs sometimes portray a typical U-shaped graph (Alvarez & Arias, 2003). This means that at a certain size, farms become less efficient and costs rise. In the past studies have been conducted that have concluded that this inefficiency can be overcome by an increase in managerial ability.

A study conducted by Tauer and Mishra (2006) analyzed the factors that account for inefficiency on dairy farms. They were interested in seeing what role managerial ability played in reducing inefficiency on dairy farms. The researchers hypothesized that when a farm adopts a new technology but does not increase efficiency that it is caused by poor management. Tauer and Mishra discovered that herd size and farmer age were associated with increased costs of
production and hence decreased efficiency. This coincides with the belief that farms become inefficient after hitting a certain herd size because managerial ability is fixed.

Alvarez and Arias (2003) discovered that there is a negative correlation between managerial ability and average cost. Thus, as farms increase in size, there will be a point when they will experience increased costs and will need to increase managerial ability in order to combat this increase. The article concludes that dairy farms can experience efficiency at any size as long as there is a sufficient increase in managerial ability in order to counteract the increasing average costs. This study confirmed the opinion that managerial ability is related to efficiency. Successful farms have an appropriate amount of managerial ability relative to their herd size. Dairy farmers can improve their managerial ability by attending higher levels of education, attending seminars to continue learning after school, and utilizing veterinarians, nutritionists, consultants, and extension agents to help to continue to improve their farm. Sometimes when increasing herd size, it is necessary to add another manager. This will allow both managers to specialize in areas they excel at causing the dairy to be run efficiently.

Factors Affecting Dairy Farm Profitability

As the number of dairy farms in New York and the United States has decreased, profitable farms have remained in business while less profitable farms have not (Gloy, et al., 2002). Studies have been conducted in order to determine what factors cause certain farms to have financial success. Through these studies it has been concluded that production and financial management, human resources management, economies of scale and risk management are related to farm profitability.

Production and financial management factors affect profitability on dairy farms. In a study by Gloy, et al. (2002), it was concluded that production management factors had the most
impact on farm profitability. The production factors they included in the analysis were efficiency, farm size, and technology use. They also found that total debt and the system the farm used to keep records were the only financial management variables analyzed that had an impact on the farms’ return on assets. The type of record system used by the farm impacts the farms’ financial success because those systems “are the source of inventory, cost and price information essential for economic evaluation required for effective planning systems” (DeLorenzo & Thomas, 1996). Thus, it is critical that a farm is using a financial record keeping system that the manager understands and can interpret the data from. Mishra and Morehart (2001) also found that dairy farmers that focused on managing their operating cash expenses often had better financial performance.

Another area of management that has a strong relationship with profitability lies within managements’ attitudes and personality traits. Bigras-Poulin, Meek, Blackburn and Martin (1985) conducted a study that analyzed why variation occurred across herds that adopted similar management practices. They determined that this was either due to intrinsic differences amongst cows or due to differences in the environment the cows were raised in. The researchers hypothesized that farm performance can be affected by the attitude or socio-psychological characteristics of the manager. After Bigras-Poulin, Meek, Martin, McMillan (1985) analyzed the data in the second part of the study through multiple regression models, they found that socio-psychological variables were present in the regression models for farm performance. Also, they discovered that four times the amount of variation in farm performance was accounted for by the socio-psychological variables than the management variables.

The attitudes and socio-psychological characteristics of managers also affect how they manage their human capital. A study by Rosenberg and Cowen (1990) analyzed whether
differences in human resources management on dairy farms affects the farms’ performance. The success of a farm is determined by how well the laborers do their tasks. “Employee performance is shaped by organizational structure and personnel management practices, which in turn derive from managerial attitudes, knowledge, and skills.” The study found that there was a positive correlation between milk production and whether or not managers believed that their personnel were motivated by an intrinsic desire to perform, responsible and had the ability to take control of managing their own work. Organizational management drives the execution of proper practices by dairy farm laborers, which in turn promotes farm profitability.

A study by Stup, Hyde, and Holden (2006) also analyzed the affect of human resources management practices on dairy farm profitability. The study defines human resource management as “the set of practices that managers use to ensure quality employee performance; including everything that managers do to recruit, select, train, communicate with, evaluate and terminate employees. Other studies have concluded that human resources management is an area that is not easy to navigate and thus farms that succeed at it could have a competitive advantage. The study found a positive relationship between dairy farms that continue training for their employees and the farms’ return on equity. This may be due to the fact that continuing to train employees after they begin working may result in increased efficiency, quality of work, and job satisfaction.

Profitability is also affected by returns to scale (Subal, 1993). While returns to scale are often higher for small farms, large farms usually experience greater profits. Because large farms have increased revenue, they can cope with increased input prices more effectively than small farms with lower revenue.
Due to the volatility in milk prices, dairy farmers focus on implementing practices that generate the greatest returns or reduce costs (Mishra & Morehart, 2001). However, not all farms are equally successful in their attempts to reduce the risk within their business. Mishra and Morehart found in their study that forward contracting and risk management had a large effect on returns to operators’ labor and management. This again portrays that farmers that make decisions that allow them to use the resource available to them in an efficient manner are often the most successful. The study also showed that managers with a college degree or a higher level of education have an increased likelihood of financial success. The researchers also concluded that participating in programs through extension and using consulting services are likely to have a positive impact on the success of the dairy.
Methodology

Data Collection

In order to assess the number of hours dairy farm managers spend per week on the 12 key managerial areas, a survey was sent to all participants of the Dairy Farm Business Summary (DFBS) that lived in New York State. “DFBS is a farm management assistance program that collects annual data from New York farmers on a voluntary basis” (Byma, et. al, 2010). A total of 232 surveys were sent out via email and post mail. A consultant with DFBS was meeting with some of the farms in the summary and he took paper copies for those farmers to complete. Those farms that did not respond within one week were followed up with a phone call. Unfortunately I was only able to receive twenty surveys back. Many dairy farmers were extremely busy and did not have the time to fill out a survey. In the future I believe that with a longer time span and if a larger geographical area was targeted, more data could be received. It would be interesting to see the affect an increase in the number of data points would have on the results of this analysis.

The senior, yet active member of management completed the survey. Farmers had the option to complete the survey online using qualtrics software or to fill out a paper copy and mail it back. A copy of the letter and the survey can be found in Appendix A. The survey asked for basic demographic information on the farmer; highest level of education achieved, years of experience as a farm laborer (milker, herdsman, etc.), and years of experience as a farm operator (owner, partner, etc.). The survey also asked how many hours per week the manager spends focusing on the twelve key managerial areas; milk quality, milk quantity, reproduction, lactating cow comfort, nutrition, reducing the incidence of metabolic disorders, dry cow comfort, calf...
management, financial record keeping, financial management, crop production, and human resources management.

The dairy farm managers provided me with access to their financials that had been entered into the Dairy Farm Business Summary. This provided me with valuable data about the farms’ size and financial position. It was assumed that all information provided to DFBS was accurate and thus provided adequate data to use in a regression analysis with the results of the survey.

Data Analysis

After compiling the survey results along with the financial and farm size data from DFBS, I performed a multiple regression analysis. Multiple regression estimates the linear relationship between multiple indicator variables and a single predictor variable (Dielman, 2005). When analyzing the data I used a level of significance of p<0.05. I also looked at R-squared adjusted for the models instead of R-squared. This is because R-squared does not account for the addition of explanatory variables. It will never decrease even if the variables that are added explain an insignificant amount of the variability in the predictor variable. Thus, to account for the additional indicator variables, I looked at R-squared adjusted. R-squared adjusted accounts for the increase in the degrees of freedom in the model and can fluctuate up or down based on the amount of variability that the additional predictor variables explain. In order to determine which indicator variables should be included in the model, I used a best subsets regression. After performing this, I looked at the results in order to determine which model had the highest R-squared adjusted, lowest mallow’s Cp and smallest standard error. Mallow’s “Cp measures the total mean square error of the fitted values of the regression.” A large Cp could
mean that there is a large mean square error of the fitted values due to either a bias in the fit or that it is not a good fit.

The first analysis that I performed looked at predicting net farm income without appreciation per cow using the twelve key management areas. I used net farm income without appreciation per cow as the predictor variable in order to account for variability in herd sizes. I discovered that the relationship had an R-squared adjusted of 70.4% with an overall p-value of 0.037, which is less than my desired level of 0.05. However, most of the twelve key managerial areas were not statistically significant. Due to this, I performed a best subsets regression and found that R-squared adjusted was maximized and mallow’s Cp and the standard error were minimized when the variables for time spent on reproduction and crop production. After removing those two indicator variables, R-squared adjusted was 73.6% and more of the indicator variables were statistically significant. However, I wanted to ensure that the model was as significant as possible, so I tested another variation of this model.

The second analysis that I performed used multiple regression analysis to predict net farm income without appreciation per cow using the twelve key managerial areas and the number of cows on the farm. This model appeared better with an R-squared adjusted of 86.8%. All of the indicator variables were statistically significant (p<0.05) except time spent on milk quality and reproduction. After running a best subsets regression, once again the model that had the highest R-squared adjusted and lowest mallow’s Cp and the standard error was the model without time spent on reproduction and crop production. Thus, I removed these two variables and the resulting model had an R-squared adjusted of 89.7% with an overall p-value of 0.001. The only indicator variable that was not statistically significant was time spent on milk quality and it had a p-value of 0.067. I still thought that possibly there was a better model that could be used.
For my final analysis I looked at using the twelve key management areas, number of cows on the farm, and pounds of milk produced to predict net farm income without appreciation per cow. This model had an R-squared of 88.8% with an overall p-value of 0.016. However, not many of the indicator variables were significant. Regardless, I still performed a best subset regression on the data and discovered that the model that maximized R-squared adjusted and minimized mallow’s Cp and the standard error excluded time spent on reproduction and crop management and the number of cows on the farm. After removing these variables, the model now had an R-squared adjusted of 91.3% with a p-value<0.0001. Every indicator variable was statistically significant except time spent on milk quality, which had a p-value of 0.056. However, I decided to leave this variable in the model, as it was extremely close to being significant. I also checked the residual plots and found nothing unordinary. Based on my analysis of the data, I determined that this model was the best to use.
Results and Discussion

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Coefficient</th>
<th>Standard Error of the Coefficient</th>
<th>T</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>274.8</td>
<td>128.5</td>
<td>2.14</td>
<td>0.070</td>
</tr>
<tr>
<td>Time spent trying to improve Milk Quality (MQUAL)</td>
<td>-74.94</td>
<td>32.77</td>
<td>-2.29</td>
<td>0.056</td>
</tr>
<tr>
<td>Time Spent focusing on increasing Milk Quantity (MQUANT)</td>
<td>-113.72</td>
<td>30.75</td>
<td>-3.70</td>
<td>0.008</td>
</tr>
<tr>
<td>Time spent trying to improve Milking Cow Comfort (MCC)</td>
<td>51.31</td>
<td>14.45</td>
<td>3.55</td>
<td>0.009</td>
</tr>
<tr>
<td>Time spent on Nutrition (NUTRI)</td>
<td>136.25</td>
<td>20.28</td>
<td>6.72</td>
<td>0.000</td>
</tr>
<tr>
<td>Time spent Reducing the Incidence of Metabolic Disorders (META)</td>
<td>-143.91</td>
<td>33.09</td>
<td>-4.35</td>
<td>0.003</td>
</tr>
<tr>
<td>Time spent trying to improve Dry Cow Comfort (DCC)</td>
<td>198.22</td>
<td>41.34</td>
<td>4.79</td>
<td>0.002</td>
</tr>
<tr>
<td>Time spent on Calf Management (CMGMT)</td>
<td>-54.78</td>
<td>10.17</td>
<td>-5.39</td>
<td>0.001</td>
</tr>
<tr>
<td>Time spent entering Financial Records (FR)</td>
<td>35.603</td>
<td>8.751</td>
<td>4.07</td>
<td>0.005</td>
</tr>
<tr>
<td>Time spent looking at Financial Management (FM)</td>
<td>-126.73</td>
<td>23.31</td>
<td>-5.44</td>
<td>0.001</td>
</tr>
<tr>
<td>Time spent on Human Resources Management (HR)</td>
<td>66.844</td>
<td>9.925</td>
<td>6.73</td>
<td>0.000</td>
</tr>
<tr>
<td>Pounds of Milk Sold (LBSM)</td>
<td>0.00002321</td>
<td>0.00000557</td>
<td>4.16</td>
<td>0.004</td>
</tr>
</tbody>
</table>

The model that I developed using multiple regression is: NFI w/o appreciation/cow=275 - 74.9 MQUAL – 114 MQUANT – 51.3 MCC + 136 NUTRI – 144 META + 198 DCC – 54.8 CMGMT + 35.6 FR – 127 FM + 66.8 HR + 0.000023 LBSM. The model has an R-squared adjusted of 91.3% which means that 91.3% of the variability in net farm income without appreciation per cow is accounted for by the linear relationship with hours spent per week on milk quality, milk quantity, milk cow comfort, nutrition, reducing the incidence of metabolic disorders, dry cow comfort, calf management, financial records, financial management, and human resources management and pounds of milk sold. The model had a p-value<0.0001. After looking at the indicator variables, it appears that the two that have the most significant impact on
net farm income without appreciation per cow are hours spent on nutrition and human resources management. Both of these have p-values<0.0001. Time spent on nutrition and human resources management both have positive relationships with net farm income without appreciation. The least significant variable is time spent on milk quality. It has a p-value of 0.056. Time spent on milk quality is negatively related with net farm income without appreciation per cow.

Time spent on milk quality, milk quantity, reducing the incidence of metabolic disorders, calf management and financial management all have a negative relationship with net farm income without appreciation per cow. Net farm income per cow without appreciation and time spent on milk quality and quantity are negatively related. This may be due in part to the fact that the main ways to increase milk quality and quantity is through proper nutrition and ensuring that the lactating cows are comfortable. Both of these management areas have a positive relationship with net farm income without appreciation per cow. The time spent focusing on reducing the incidence of metabolic disorders may have a negative impact on net farm income without appreciation because other management areas such as dry cow comfort and nutrition are themselves preventative measures for reducing metabolic disorders. A study by Mulligan, O’Grady, Rice and Doherty (2006) stated that managing dairy nutrition in a way that focuses on reducing metabolic diseases would have a great pay-off because it will alleviate the financial burden caused by metabolic disorders. As this study suggests, focusing on reducing metabolic disorders alone is not enough, it also needs to be combined with a focus on nutrition. The model portrays a negative relationship between calf management and net farm income without appreciation per cow. However, this may be due to the fact that calf management does not have a direct correlation with current year financials. It would be interesting to conduct this study
over a period of years and analyze whether farmers that focused on calf management had any
affect on income in the long run. Although this study found a negative relationship between time
spent on financial management and net farm income without appreciation, there was a positive
relationship between time spent on financial records and net farm income without appreciation.

Net farm income without appreciation per cow is positively related to time spent on
milking cow comfort, nutrition, dry cow comfort, financial records and human resources
management and pounds of milk sold. These results correspond to what has been found in other
studies. A study on cow comfort (2006) found that lameness not only reduces the longevity of
the cow, but then results in larger veterinary costs for treatment and higher turnover resulting in
larger herd replacement expenses. They study also determined that poor cow comfort can cause
a loss of over 1,000 pounds of milk per cow. In a study conducted by Mulligan, et al. (2006), the
researchers stated that dairy farm managers need to focus on the management of their nutrition
program in order to reduce metabolic disorders that often occur after freshening. These diseases
decrease profits and the well being of the cow. After a cow has been treated for a metabolic
disorder, she is then prone to developing other diseases, which will cost even more money to
treat. Gloy, et al. (2002) found that the farms’ financial record keeping system had a strong
relationship with farm profitability. DeLorenzo and Thomas (1996) expressed the importance of
the data produced by the farms’ financial record keeping system in making strategic decisions
that affect the entire farm. Studies by Rosenberg and Cowen (1990) and Stup, et al. (2006)
determined that human resources management has an impact on the financial success of the dairy
farm. This is due to the fact that dairy farm managers that focus on the employees are more
likely to ensure that their employees know the best practices for performing each task. Also,
they are more likely to continue to educate and train their employees which leads to increased
employee growth and satisfaction. When employees are satisfied the operation runs a lot smoother because employees are less likely to be absent and more likely to show up to work motivated and enthused about their job.

One limitation of this study is that there may be endogeneity within the model. Endogeneity occurs when a change in the dependent variable or other independent variables results in a change in the independent variable (Little). For example, net farm income per cow without appreciation may determine how much time farmers spend per week focusing on reducing the incidence of metabolic disorders. If a farm has a large number of metabolic disorders, their net farm income per cow without appreciation will be lower, causing the farmer to then begin to focus on reducing metabolic disorders in order to increase net farm income without appreciation. The same may be true with time spent on improving milk quality and increasing milk quantity. Or time spent on nutrition and cow comfort may affect time spent on reducing metabolic disorders, improving milk quality and increasing milk quantity.
Conclusion

A multiple variable regression analysis was used to analyze the relationship between twelve key management areas and net farm income without appreciation per cow. In order to determine which variables should be included in the model, a best subset regression was performed. This study found that there is a relationship between net farm income without appreciation per cow and the time managers spend focusing on milk quality, milk quantity, milking cow comfort, nutrition, reducing the incidence of metabolic disorders, dry cow comfort, financial records, financial management, and human resources management and pounds of milk sold. As we would expect, time spent on milking cow comfort, nutrition, dry cow comfort, financial records, and human resources management and pounds of milk sold have a positive impact on net farm income without appreciation per cow. Many studies have been conducted that have concluded a similar relationship between the aforementioned management areas and dairy farm financial performance. However, the difference with this study and others previously conducted is that this study focuses specifically on the time the senior, yet active member of the dairy farm management team spends on the management area. It is important to understand this relationship in order to best structure the manager’s time. While it is necessary to know what factors affect production, it is also necessary to know how to divide the dairy farm managers’ time amongst these areas.

In the future, the research done in this study should be expanded. Only twenty dairy farmers responded to my survey, thus in the future it is necessary to include a large number of farmers. My data only included dairy farms in New York State that participated in the dairy farm business summary. This could have skewed the data as these farms are among some of the most progressive, innovative dairies in the state. Also, only New York State was included, thus
the data does not reflect variation across geographical regions. In order to account for this, the study could be redesigned in the future to include a random sample of dairy farms from across the United States. Also, I attempted to adjust for farm size by using net farm income without appreciation per cow. However, it would be interesting to split the data into two small samples, one for small farms and one for large farms, and see if this affected the model at all. Making these changes when conducting this study again would help to create a model that was more inclusive and produced more accurate results.
References


Dear ______________________,

Hello! I am Carolyn Braun, a senior at Cornell University; double majoring in Dairy Science and Applied Economics and Management. This semester I am working with Dr. Knoblauch on writing an undergraduate honors thesis. My thesis will be analyzing the relationship between how dairy farmers divide their time amongst twelve key management areas and any impact this may have on farm profit. In order to do this, I am sending a survey to all participants of the New York State Dairy Farm Business Summary.

I would greatly appreciate your help with my thesis. There is a paper copy of the survey enclosed for anyone that is receiving this letter in the mail and does not have access to the Internet. The survey can be found online at https://cornell.qualtrics.com/SE/?SID=SV_bpwnbF4OKSLsGqM. I would ask that the senior, yet active, member of management respond to these questions. In order to analyze your survey results I will also need your permission to access your farm’s net income in 2010 as it is entered in the Dairy Farm Business Summary database. I have included a waiver that you need to sign in order to grant me access.

Thank you very much for your assistance. I look forward to hearing back from you. If you have any questions or comments you can contact me at cmb364@cornell.edu or (518) 944-4153 or Wayne Knoblauch at (607) 255-1599 or wak4@cornell.edu. Once again thank you for everything.

Thank you,

Carolyn Braun
Your Name: ______________________

Farm Name: ______________________

Highest Education Level Achieved:
___ Some High School
___ High School Diploma
___ Some College
___ Associates Degree
___ Bachelor’s Degree
___ Master’s Degree
___ PhD
___ DVM
___ Other _____________

Years of experience as a farm laborer (milker, herdsman, etc.)_____________

Years of experience as a farm operator (owner, partner, etc.)____________

How many **hours per week** would you estimate that you spend focusing on management in the following areas:

1) Milk Quality (Reducing Somatic Cell Counts, Bacteria Counts, etc.)

2) Milk Quantity (Increasing pounds of milk produced per cow, etc.)

3) Reproduction (Heat detection, artificial insemination, heat synchronization programs, etc.)

4) Lactating Cow Comfort (Stall cleanliness, stall bedding, etc.)
5) Nutrition (Selecting the ration, preparing the ration, etc.)

6) Reducing the incidence of metabolic disorders (Observing cows, analyzing milk graphs, etc.)

7) Dry cow comfort (Observing cows, addressing issues with stalls, etc.)

8) Calf Management (Feeding calves, treating calves, bedding hutches or pens, etc.)

9) Financial Record Keeping (Entering inflows and outflows into checkbook or a computer program, payroll, etc.)

10) Financial Management (Review of financial reports, budgeting and forward planning, comparison of actual to budget, income tax management, etc.)

11) Crop Production (Seed, Fertilizer, and Herbicide Selection, etc.)

12) Human Resources (Managing labor, etc.)

Thank you. A copy of the results will be sent to you. If you have any questions or comments you can contact me at cmb364@cornell.edu or (518) 944-4153 or Wayne Knoblauch at (607) 255-1599 or wak4@cornell.edu.

Thank you,

Carolyn M. Braun