

Statement of Professional Contributions and Scholarship

Introduction

The Brown County dairy industry plays a large role in economic development, by creating over 21,000 jobs and accounting for \$3.5 billion in economic activity (Deller 2011). As of September 2011, there are 224 dairy farms in Brown County providing quarters for 41,000 milk cows with herds ranging in size from 35 to over 4,000 head.

In 2007 a needs assessment survey of all 241 dairy farms in Brown County was conducted by this agent. The top five highest rated topics (Likert Scale: 1=no interest, 7=very interested) by producer respondents (n=56) were Promotion of Agricultural Awareness (3.84), Transition Cow Management (3.8), Forage Quality Management (3.8), Dairy Nutrition (3.7) and Nutrient Management (3.74). Using the survey results, exiting comments made by previous agriculture agents, and personal observations, this agent identified the following major areas to focus programming efforts: 1) Dairy Modernization and Management, 2) Dairy Crop Management, and 3) Strategies for Improved Rural/Urban Agricultural Awareness.

Dairy Modernization and Management Overview

Brown County has seen a dramatic change in its dairy industry in recent years. Over one-half of the cows in the county are currently housed in facilities that were built within the last 15 years. The decision to expand and modernize dairy facilities was largely driven by economic factors. With increasing cow numbers, dairy farmers must address the issues of cow comfort, manure management and employee training. Whether they are building a completely new operation, retrofitting their current facilities, or making minor additions to their current barn, this agent plays a role in helping producers evaluate their options.

In addition to economic factors, improved quality of life is driving the modernization decision-making process. Farm families now want their children to enjoy the opportunities that urban families have available. Small, single family farms often struggle to attain a "quality of life." Consequently, more time away from farm activities is needed. For many families this has meant they have expanded their operations to milk more cows and utilize additional hired help to free-up time for their personal goals.

Dairy Herd Management

Class III milk prices dropped from \$19.32 in January of 2008 to \$10.78 per hundredweight in January of 2009 and maintained record lows for the remainder of the year. This resulted in severe economic distress for dairy producers. This ongoing volatility has prompted four dairy producers in Brown County to implement the use of management teams for their operations. The size of the dairies ranged from 50 to over 2,000 head of cattle.

Beginning in October 2009, producers were able to apply for Wisconsin Department of Agriculture, Trade, and Consumer Protection (WDATCP) Grow Wisconsin Dairy Team (GWDT) grants which provided up to \$2,000 per farm to be used in the development of strategies to improve the operations of the farm in an effort to ensure future viability. The management teams were comprised of owners, herd managers, veterinarians, nutritionists, agronomists, accountants, lenders, and Extension specialists. As part of the management team, this agent conducted a Strength, Weakness, Opportunity, and Threat (SWOT) Analysis and served as a facilitator for each of the four farms. An evaluation was conducted with all producers and team members (n=29) on the impact of the GWDT management teams. Examples of the impact of dairy management teams led by this agent include:

Management changes implemented on Farm 1 resulted in:

- Being more aware of herd health and specific management practices that can impact profitability

Management changes implemented on Farm 2 resulted in:

- Increased production from 49 pounds to 55 pounds per head per day, an increase of 12 percent
- Decreased feed costs of \$1.23 per head per day
- The financial impact realized from increased production and decreased feed costs was approximately \$17,000 per month or over \$200,000 per year

Dairy Modernization and Management Overview / Dairy Herd Management (continued)

Management changes implemented on Farm 3 resulted in:

- An enterprise analysis was performed and fine-tuned that reflected more accurate cost of production expenses for forages and grains grown on the farm

Management changes implemented on Farm 4 resulted in:

- More efficient utilization of their heifer facility by making internal adjustments and starting to custom raise heifers for another dairy
- Increased stocking densities lowered the owner's cost of production for their replacement heifers by \$.96/head/day
- A total financial impact realized by this producer was approximately \$67,000 per year

Not only have these farms seen increases in production efficiencies and profitability but also strengthened relationships between the farm participants and their service providers. As a result of the positive impact the teams had on these farms, this agent continues to serve as their facilitator and meet with the teams on a regular basis.

For each of the past five years, this agent has cooperated with the Northeast Wisconsin Technical College (NWTC) to educate approximately 300 farmers enrolled in the college's Farm Management program. The collaborative venture has allowed this agent to expand contacts in the agricultural community as well as educate farmers about current practices used in the field of agriculture. This agent teaches one topic at four different locations annually. An example of the subject matter taught involved animal identification methods. This presentation was evaluated (n=42) and reflected a 50 percent increase in knowledge (Likert scale 1=low to 5=high) and planned changes in animal identification practice.

Most recently, in conjunction with the Labor Management Issues portion of the NWTC course, an interactive presentation was developed addressing "Animal Welfare or Animal Rights? Do Words Matter?". The presentation aided in developing a more acute understanding of the delicate balance this subject creates in the eyes of the public. An evaluation of this presentation (n=30) showed participants increased their knowledge by 60 percent (Likert scale 1=low to 5=high).

Facilities/Modernization

Dairy modernization meetings have been successfully held in Brown County and collaboratively with adjacent counties in northeast Wisconsin. This agent and the Oconto County Agriculture Agent were the co-developers of these events. Since this ongoing program's inception in 2007, approximately 300 producers and agri-service professionals have attended. Various presentations and demonstrations were offered to producers. Examples of the topics presented at these meetings were: cow comfort; free stall, heifer and transition cow housing designs; and the construction permit application process. The evaluation of the presentation (n=46) entitled "Don't Let Permits Delay your Project" presented by this agent indicated an increase in knowledge by 49 percent (Likert scale 1=low to 5=high).

Milk Quality

Mastitis is the number one herd health issue experienced by the dairy industry. Improved milk quality can result in increased milk quality premiums, increased milk production, and a reduction of clinical cases of mastitis. To that end, this agent enrolled five herds involving 4,200 cows in an ongoing clinical mastitis study with the UWEX Extension Dairy Milk Quality Specialist to determine the baseline antibiotic use on farms. Not only did this agent actively collect cow treatment records and milk samples, but locally took the data and interpreted the results for the producers and assisted them in implementing management changes to improve milk quality. Producers enrolled in this project have noted the aforementioned was a valuable resource and has proven to be beneficial to herd health, milk quality, and production.

Based on input from this agent, management changes and results from two of the farms are:

- Farm 1 (350 cow herd): Changes in bedding practices and bedding management protocols resulted in a decrease in somatic cell count from 240,000 to 180,000, resulting in an increased milk check premium of 21 cents per hundred weight or \$17,640 per year

Dairy Modernization and Management Overview / Milk Quality (continued)

- Farm 2 (2,200 cow herd):
 - More accurate bacteria identification yielded better treatment rates and less discarded milk (\$7,500 saved per year)
 - Re-evaluation of how milkers take samples resulting in less contaminated milk samples. Because of this, contaminated milk samples were reduced by 50 percent or \$2,000 savings per year based on number of contaminated samples and re-submission of samples.

In an effort to re-emphasize the importance of cow care and management on milk quality, an article on teat quality was written by this agent for Hoard's Dairyman magazine, a worldwide publication. A fact sheet was then developed and distributed as an additional reference guide for producers.

Manure Handling and Management

Manure management in Brown County is a critical issue related to herd expansion. In 2009, the inaugural Midwest Manure Summit, a two-day conference, was planned to address this ever-growing concern. This agent and the former Fond du Lac County Dairy and Livestock Agent were the co-organizers of this event. The Midwest Manure Summit was designed to bring new and innovative ideas from across the world that addressed technological difficulties related to manure handling and processing. The event was advertised throughout the Midwest and held at Lambeau Field in Green Bay. Sponsorships and successful collaborations with government agencies and agribusinesses were utilized to defray speaker costs. Nearly 300 people from 11 states and two Canadian provinces attended the two-day event. Twenty-one speakers covered various topics related to manure. Proceedings and pod casts were made available at www.midwestmanure.com.

The initial response to the event was overwhelmingly positive. Connections were made between producers and industry that will foster technological changes for an extended period of time. Many of the economic benefits of various concepts discussed at the Midwest Manure Summit have been or will be applied to farms in the near future. The website continues to be a well utilized resource for information discussed at the conference.

The evaluation of the Midwest Manure Summit was done in two phases. Phase One utilized an immediate post meeting evaluation (n=142) of conference effectiveness. The conference garnered a 4.2, which reflected an effective use of attendees' time (Likert scale: 1=low, 5=high,). Phase Two involved a six-month post meeting evaluation to measure the understanding and application of educational information from the conference. A Zoomerang evaluation was developed and sent out to the registrant email list. The respondents (n=38) indicated they learned about new management practices (34 percent), increased understanding of new technology (84 percent), and gained an awareness of available resources (45 percent). Practices or ideas that were applied by participants as a result of attending the summit included digesters (46 percent), composting (33 percent), sand management (33 percent), and phosphorus technology (21 percent).

Of the 38 attendees who responded, 100 percent said they would attend a future conference. Due to the positive response and ever-changing technologies, a second Manure Summit, also co-chaired by this agent, was held February 15-16, 2011. It was gratifying to receive a letter from John Shutske, ANRE Program Director and Associate Dean—College of Agricultural and Life Sciences, expressing his appreciation for this agent's effort in planning and organizing the Midwest Manure Summit.

Employee Safety and Training

The 2007 needs assessment identified farm safety as a major concern in the agricultural community. In the state of Wisconsin, several deaths have been attributed to skid steer related accidents. There were limited resources to help train and educate bilingual employees. There was no formal skid steer safety program available in Wisconsin. This agent wrote and developed a bilingual skid steer safety training program (**Exhibit 6**). Materials developed by this agent for the module included: self-playing voice-over presentation, numerous fact sheets, safety checklists, and program evaluation materials.

Dairy Modernization and Management Overview / Employee Safety and Training (continued)

This program was piloted locally by this agent for 12 individuals. The training included 45 minutes of classroom instruction, followed by an outside skills course for trainees to utilize the skills just learned. Based on feedback received this agent made changes to improve the quality and impact of this module.

This agent received requests to teach an additional four training sessions in the capacity of classroom presenter and/or skills course supervisor for 52 individuals across the state. A majority of participants were Spanish speaking. Evaluations from all five trainings (n=64) were positive. Some reflective comments from participants were:

- *“UW-Extension does great training. This was the first skid steer training I’ve seen offered.”*
- *A more experienced operator commented, “It was a good refresher on safety!”*

As a result of this program, twelve UWEX Agents in the state have held training sessions for an additional 70 people. Three of these sessions were taught in English and Spanish. Since the official release of the Dairy Workers Training-Skid Steer Skills Module VI at the 2010 World Dairy Expo, there have been 78 copies of the instructional CD/DVD and 23 copies of the bi-lingual manual sold. In addition, this agent developed a “Skid Steer Handling Skills” fact sheet that is available to the public via printed copy or on the Brown County UW-Extension website.

Occupational Safety and Health Administration (OSHA) and National Farm Medicine Center (NFMC) have both been supportive of Module VI. Dr. Matthew Keifer, M.D. Senior Research Scientist for NFMC, and Tom Drendel, Agricultural Safety Specialist for the NFMC, were both in attendance at a training session this agent delivered at Thorp, WI. Dr. Keifer’s evaluation of the training session is as follows:

“It was a pleasure to work with Mark. He was attentive to the audience needs. He was responsive to the questions that came up and he had a quiet, direct and effective delivery of the material. He clearly knew the content well and was able to explain the slides to those who did not understand fully. As a university professor for many years, I am very sensitive to and appreciative of good quality teaching capability. I found Mark’s to be highly developed. He is effective.”

Because of the trainings offered, this agent has recognized the need for skid steer safety training outside of the agricultural community. The commercial landscaping community has expressed an interest in this training program by sending employees who are in need of a safety training program.

Employee safety and training are of great concern to OSHA. Because of this concern, this agent and the former Fond du Lac County Dairy and Livestock Agent developed the presentation “OSHA Basics for Dairy Farms.” This presentation was given at the Department of Natural Resources (DNR) Confined Animal Feeding Operations (CAFO) permit holder meetings for approximately 200 individuals in northeast Wisconsin. As a result of these presentations, dairy producers requested this agent to conduct a farm safety risk assessment. Five farms housing in excess of 13,100 cows and employing 167 workers were reviewed in an effort to help owners and managers get a better grasp on what OSHA would be interested in assessing if an unannounced farm safety audit were to occur. The primary issues of concern that came to light were manure lagoon fencing, reception pit/grain bin confined space protocols, and employee training/injury/illness monitoring. As part of the farms’ first steps to become OSHA compliant, all five farms purchased Module VI and implemented the training module as part of their employee safety training.

The success of the farm safety risk assessment walk-throughs prompted the Four-State Dairy Extension Group to request a presentation summarizing the results of these on-farm safety assessments. This agent and the Kewaunee County Agriculture Agent developed this presentation for 15 state dairy extension specialists highlighting observations and experiences gathered from the combined farm safety visits at their annual meeting.

Finally, this agent has authored three articles for the Dairy Workers/El Compañero newsletter which is distributed to 600 farms and 1,300 employees in northeast Wisconsin. The bilingual management and employee safety newsletter delivers information to dairy farm employees through their primary language on a bi-monthly basis.

Dairy Modernization and Management Overview / Employee Safety and Training (continued)

Dairy Beef Quality Assurance/Animal Husbandry

An interesting and beneficial linkage exists between dairy modernization, meat animal quality assurance, and animal husbandry. A presentation that specifically dealt with these areas was jointly developed by this agent and the former Fond du Lac County Dairy and Livestock Agent. It was presented to nearly 400 dairy producers, veterinarians and consultants at both the 2010 Dairy Modernization meetings and the inaugural Dairy and Beef Cattle Husbandry Conference. An evaluation of both the Animal Husbandry Conference and the Dairy Modernization Meetings serves to reaffirm the importance of these overlapping issues to producers and industry representatives.

An overall program review for Dairy Modernization and Management was conducted in June 2011. Producers/employees and agricultural service providers were asked to evaluate information and programming received from this agent. The following table details those results:

As a result of receiving information from the Brown County Agriculture Educator over the past four years, I have (n=70):	Yes	No	N/A
Made more informed decisions about dairy nutrition/feed costs.	53	1	16
Used and implemented information about dairy modernization (manure handling, facility building or renovation, etc.).	44	3	23
Improved animal health in my/my client's operation (milk quality, reproduction, calf care).	49	1	20
Trained employees in areas of milk quality, animal health, and safety.	42	2	26

Dairy Crop Management

Another identified need for Brown County producers was dairy crop management. There are over 61,000 acres of forage grown in Brown County for use in dairy rations. Alfalfa and corn silage are important components of dairy rations and can be profitable cash crops. High quality forage can reduce feed costs and increase profitability. The key management component for producing high quality forage is identifying the optimum harvest date. Alfalfa scissors cutting projects and corn silage dry down events have been used by UW-Extension agents in past years to help producers monitor crop quality. These programs had been missing in Brown County for several years prior to this agent's arrival.

Scissors Cutting/Alfalfa Quality

Randomly chosen fields in Brown County were selected to sample alfalfa twice weekly from the late vegetative stage until harvest. The scissors cutting data gathered was made available to 64 producers, agronomists, and nutrition consultants via electronic transmission and fax. Bi-weekly radio spots were used in order to facilitate the release of timely information to the public. The data this agent collected also was posted on the state-wide UW-Extension Forage Quality Website. Samples collected by this agent for the alfalfa scissors cutting project were also utilized for a Relative Feed Value vs. Relative Forage Quality study completed by the UW-Extension Forage Agronomist in 2009.

Evaluation of the alfalfa scissors cutting project indicated an overwhelmingly positive response from all quadrants of the county. A county-wide evaluation (n=34) indicated this program should continue. Ninety seven percent of the producers indicated alfalfa haylage quality was increased as a result of this program. The local media was very enthusiastic in their efforts to publicize and promote the educational benefit of this program.

Since 2007, the request for direct alfalfa scissors cutting information has grown (see table next page). This group includes local producers, service providers, and educators.

Dairy Crop Management / Scissors Cutting/Alfalfa Quality (continued)

Recipients of Alfalfa Scissors Cutting Project Results (2007-2011)	
Year	Recipients
2007	38
2008	49
2009	64
2010	96
2011	114

In an attempt to increase programming in the forage management area and to someday establish a local forage council within the county, this agent co-developed the Brown and Kewaunee County Dairy Forage Seminar with the Kewaunee County Agriculture Agent. This agent co-developed and presented “An Overview of the Brown and Kewaunee Scissors Cut Project and How it Relates to the Wisconsin Alfalfa Yield Persistence Project” for 13 participants. Evaluations from the five presentations delivered indicated an average of slightly over four (Likert Scale 1=low to 5=high), showing an increase of knowledge and that the information taught was relevant and useful.

An overall program review was conducted for Dairy Crop Management in July 2011. Producers/ employees and agricultural service providers were asked to evaluate information and programming received from this agent. The following table details those results:

As a result of receiving information from the Brown County Agriculture Educator over the past four years (n=70):	Yes	No	N/A
Utilizing alfalfa scissor clipping information enabled me (enabled me to advise my clients) to harvest first crop alfalfa in a more timely fashion.	55	2	13

Corn Silage Quality

The objective of a corn silage dry down event is to identify whole plant moisture of the maturing corn crop. Whole plant moisture is critical to optimize silage quality resulting in improved animal performance. The Brown County UWEX corn silage dry down program has evolved from samples being collected at seven participating farms to 50 producers submitting samples for whole plant moisture determination.

Number of Corn Silage Dry Down Samples (2007-2011)	
Year	Samples
2007	14
2008	41
2009	100
2010	85*
2011	102

*The 2010 number is lower than 2009 due to decreased funding for lab testing.

An overall program evaluation was conducted in July 2011. Producers/employees and agricultural service providers were asked to evaluate information and programming received from this agent. The following table details those results:

As a result of receiving information from the Brown County Agriculture Educator over the past four years (n=70):	Yes	No	N/A
Utilizing corn silage dry down information enabled me (enabled me to advise my clients) to harvest corn silage in a more timely fashion.	58	1	11

Further impact of forage programming conducted by this agent over the past five years is evident by the following statements garnered from the aforementioned program evaluation: *“These programs have created an awareness of our crop’s progress, allowing us to make a more timely harvest to hit peak quality.”*

Dairy Crop Management / Corn Silage Quality (continued)

- *“Without the scissor clipping or dry down programs, I wouldn’t be able to take full advantage of making good quality forages. This in turn helps cut my protein costs at the feed mill and improves my overall farm income, which is one of the goals that Mark had us working toward.”*

Nutrient Management

Continuing concerns related to the elevated levels of phosphorus and sediment loading in the Lower Fox River Basin from agriculture and commercial industry has been voiced in Brown County. Due to these ongoing concerns, the Lower Fox River Basin TMDL technical team requested a series of best management practices be investigated by this agent. A few of the entities represented on this team were the Wisconsin Department of Natural Resources (DNR), the Environmental Protection Agency, the Wisconsin Department of Agriculture Trade and Consumer Protection, multiple county land and water conservation departments, and multiple municipal waste treatment centers. As requested, this agent researched and developed a technical guide that addressed the cost and implementation of ten agricultural best management practices to aid in controlling the levels of phosphorus and sediment loading. As a result of this ongoing project a presentation titled “TMDL-An Ag Perspective” was developed and co-presented with the Brown County Land and Water Conservation department head to 71 individuals at three regional meetings. A post-meeting evaluation indicated respondents (n=71) increased their knowledge on this subject matter by 53 percent. This work has been accepted for publication in the Journal of Soil & Water Conservation.

Strategies for Improved Rural/Urban Agricultural Awareness

The very fabric of rural Brown County has changed from being largely agrarian to a suburban setting where farm and urban residents exist together. Brown County continues its trend of growth as dairy/livestock numbers are on the increase. The county has seen a 12 percent increase in the number of cows from 1998 to 2008. Unfortunately the county has lost 10,000 acres of agricultural land during the previous decade. Almost all of the loss is due to urban sprawl and development. In addition, while animal numbers have increased, the number of farms has decreased. This trend indicates there is a smaller percentage of the population feeling connected to agriculture than ever before in the history of the county. With urban centers moving further into traditionally agricultural areas, issues such as neighbor relations and manure management have become increasingly important. There are opportunities for both the producers and their non-agriculture neighbors to increase understanding of each other’s lifestyles through education and awareness. Brown County Land Conservation, Natural Resources and Conservation Service, and Brown County Farm Bureau have potential to be strong allies with UW-Extension in this effort.

It was this agent’s privilege to be involved in the development of Brown County’s Farm Technology Days (FTD) held in 2008. In order to promote an awareness of FTD and agriculture in Brown County, this agent developed a presentation that was given to 1000 people at 28 civic groups and organization meeting. The original presentation has since been modified to serve as an educational agriculture literacy tool. Four colleagues in the Eastern District have been able to take this PowerPoint presentation and edit it to a point that it can be used easily and effectively for their county needs.

In order to help promote and develop an understanding between urban and agricultural points of view, this agent has become actively involved in educating the youth of Brown County. Interactive presentations were developed and delivered to 45 students at two high school FFA chapters. These ongoing presentations highlighted issues regarding rural/urban interface, social dilemmas being experienced by agricultural producers, and the development of youth leadership skills. The interactive nature of these presentations has been enthusiastically received by many of the youth and their leaders.

Agriculture education for urban youth continues to gain traction in Brown County. This agent has had the opportunity to work with both De Pere and Green Bay East High Schools as a member of their Agri-Science Advisory Committees. These institutions are making a significant effort to increase the number of Articulated and Transcribed courses that will qualify for technical school credit upon graduation and/or satisfy the Department of Public Instructions Learning targets for science equivalency credits. It has literally been a “learning experience”

working with these dedicated teachers and administrators as they strive to broaden the learning opportunities offered to area youth.

Implications/Reflections

The expanding need for agricultural education and programming continues to be a challenge for this agent. The clientele found in this county are self-reliant individuals. This agent served as Executive Secretary to the FTD County Executive Board of Directors. There was a great deal of discussion regarding how difficult it would be to start a new job, in a new county, and also fulfill the duties and obligations of this position. The experience allowed this agent to establish many relationships with people involved in various aspects of the agricultural industry. It also afforded this agent the unexpected opportunity to meet and network with people not involved in agriculture. A situation that initially looked very challenging ultimately turned into a blessing in disguise. Developing new relationships has been a critical component in establishing credibility with the producers and stakeholders in the county.

Over the years this agent has worked with producers large and small. During this time, this agent has observed the necessity of developing and delivering programming to Brown County producers that is unavailable from other service providers or agriculture professionals. This observation has been substantiated through programming evaluations. Based on programming evaluation this agent has drawn several conclusions. The first conclusion pinpoints the tendency of “traditional sized producers” to be more receptive to agricultural programming conducted by this agent. The second conclusion drawn was based upon the “CAFO - size facilities” owners. These owners and their service providers are less willing to take advantage of offered programming due to the specialists they already employ. This agent has determined that by directly involving the producer in university guided on-the-farm research, the producers experience the benefits of working cooperatively with the University of Wisconsin and Cooperative Extension. The employee training module developed and delivered by this agent have been accepted and utilized by producers in this county and state. It is very fulfilling to develop relevant materials that are used, appreciated, and bring accolades to UWEX nationally. This agent will continue to develop and implement programming in areas such as farm safety, OSHA compliance and animal welfare.

The challenge of providing effective programming for the clientele has led this agent to employ technology as a key component in the distribution of information. This agent has always had an interest in new technology and how it can be used to increase efficiency. Having the opportunity to work for and with other UWEX colleagues has offered opportunities to learn, utilize, and benefit from new forms of data collection and more efficient use of electronic distribution of information. Undoubtedly these avenues would have never been traveled if this agent hadn't chosen UWEX as a career path. Electronic distribution of short, concise pieces of information has proven to be effective and well accepted by clientele. Active and engaging presentations for multi-generational groups were also created through the use of Turning Point interactive software.

In the overall program evaluation, respondents (n=70) were asked “How would you rate the overall performance of this agent over the last four years?” Ninety-eight percent of respondents replied “Good” or “Excellent”. Some of the comments received on the evaluation included:

- *“Mark has done a great job for us in the years that he has been in Brown County. He has made himself available to us more than any agent who has held this position in the past. He certainly is willing to tackle any issue that comes up and not be afraid to get his hands dirty doing it. He truly is an asset to the dairy industry because of the help he is always willing to offer to the farmers and is always alerting us to the latest programs and technology that becomes available to the industry.”*
- *“Mark continues to be an excellent source of unbiased and timely information for my clients and Northeast Wisconsin.”*

As this agent reviews the overall program evaluation, it is a bit humbling to read the supportive comments returned and the realization that the work being done is appreciated and effective. From a professional standpoint, it is gratifying to see the information given to a producer, implemented with results that benefit the producer, and lend credibility to this agent and UWEX.