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Statement of Professional Contributions and Scholarship

Introduction

My professional objective, since starting with the University of Wisconsin-Extension (UWEX) in October 2013, is to extend the knowledge base, human capital, and physical resources of UWEX to the dairy and livestock industry in Oconto and Marinette Counties. I have dedicated my academic efforts to collaborating with UWEX colleagues, industry professionals, and community members in the development of high quality, relevant educational programs while supplementing the intellectual knowledge base of UWEX.

Oconto and Marinette Counties have a formal specialization agreement allowing the county's agriculture agents to specialize in dairy and livestock (Oconto County) or agronomy and horticulture (Marinette County). The agents collaborate on educational programming where appropriate. The specialization agreement provides farmers, home gardeners, and agribusinesses in both counties specialized technical advice and assistance in solving complex production, management, and environmental challenges.

My programming emphasis areas are: 1) animal health and well-being and 2) farm financial health and management. The scope of my educational work in animal health and well-being focuses on calf and heifer management, facilities management, and milk and meat quality. My work in farm financial health and management focuses on farm succession, financial management, and farm efficiencies achieved through farm modernization.

Impact of Extension Agriculture Programming in Oconto and Marinette Counties

Agriculture is a key contributor to Oconto and Marinette Counties' economy. According to "Oconto County Agriculture: Value and Economic Impact" (Deller, 2014), agriculture provides 4,193 jobs and \$126.4 million to the county's income. Dairy is Oconto County's leading agricultural sector. In 2012, 154 dairy farms housing 20,100 dairy cows, contributed \$97.3 million to the local economy in on-farm milk production and milk sales. In addition to dairy production; grain, cattle and calves, and vegetable production drive approximately \$1.3 billion in economic activity in Oconto County (United States Department of Agriculture National Agriculture Statistics Survey (USDA NASS, 2012)). During the same time period, Marinette County had 66 dairy farms housing 11,800 dairy cows and contributing \$55.1 million to the local economy in on-farm milk production and milk sales (USDA NASS, 2012).

In spring 2014, I conducted a local needs assessment, distributing surveys to 788 farmers and agribusiness professionals in Oconto and Marinette Counties. One hundred thirty-nine usable surveys were returned (17 percent response rate). Respondents were asked to rate agricultural topics based on individual educational needs (Likert scale, 1=no need to 5=high need). Highest ranked animal health topics included: calf/heifer management (2.74), dairy modernization (2.68), milk quality (2.65), and dairy facilities (2.55). Top farm management educational needs were: farm succession (3.11), financial management (2.88), and use of technology (2.76). The survey results, in addition to my educational background and experience in veterinary medicine, were used to guide and prioritize my educational programming in Oconto and Marinette Counties.

I have utilized a myriad of media outlets to effectively disseminate educational information to the geographically-expansive audience of Oconto and Marinette Counties, many who often lack reliable internet connection. Since 2013, I have authored 90 local newspaper articles (20,500 circulation), six state newspaper articles (20,000 to 29,000 circulation), four *Dairy Partner/El Compañero* articles (1,700 circulation), 22 county newsletters (832 circulation) and recorded 43 radio shows (25,000 listenership) on a variety of animal health, animal well-being, and farm financial health and management topics.

Through the use of diverse media outlets, local educational programming, one-on-one farm consultations, and on-farm research projects, I have met the identified educational needs of residents in Oconto and Marinette Counties. An overall program evaluation was distributed to farmers and agribusiness professionals in Oconto and Marinette Counties during summer 2017 (N=832). Fifty-seven surveys were completed, for a seven percent return rate. Of the respondents, 79 percent had utilized UWEX Oconto County educational resources, citing reading the monthly Oconto/Marinette UWEX agriculture newsletter (77 percent), attending a local UWEX meeting (44 percent), and reading the *Oconto County Times Herald* articles (25 percent) for information. Fifty-eight percent reported an increase in knowledge of agricultural best management practices after utilizing my educational materials and programming. Specifically, respondents reported an increase in knowledge of farm succession planning (28 percent), veterinary feed directive rules (24 percent), and UWEX services (18 percent). This increase in knowledge led to positive change, with 23 percent of respondents further discussing the veterinary feed directive with an agriculture professional/consultant, 21 percent benefitting from improved family communications regarding farm succession, 14 percent starting farm transfer planning, and 12 percent developing standardized cleaning protocols for calf feeding equipment. Eighteen percent of respondents experienced an increase in farm productivity from implementing my suggested management changes, with decreased cow or calf illness (4 responses) and decreased cow or calf death (2 responses) as the most cited farm improvements.

Animal Health and Well-Being

Calf Equipment Sanitation Audits

Dairy replacements, or young animals that will ultimately become lactating animals in the herd, are the foundation for genetic progress and improvement of the herd. Raising productive and successful dairy replacements is the second highest expenditure on Wisconsin dairy farms, behind feed costs, when all factors of milk production are considered (Hagedorn et al., 2013). It is estimated to cost \$2,377 to raise a single replacement animal from birth to calving (Hagedorn et al., 2013). This cost can increase significantly if young animals are taxed with diarrheal diseases, which can reduce animal growth and productivity, require treatment, and/or lead to death. The USDA National Animal Health Monitoring System estimates 23.9 percent of pre-weaned heifers are treated for diarrheal diseases (NAHMS, 2007), with diarrhea cited as the leading cause of death of dairy heifers of all age groups (NAHMS, 2011).

Diarrhea in calves can result from a multitude of issues, with many cases likely resulting from improper hygiene leading to increased pathogen loads in calf raising facilities. Insufficient farmer knowledge of proper cleaning and sanitation of calf feeding equipment significantly contributes to disease transmission. To address this educational need, I initiated an on-farm pilot study, funded by an \$8,000 grant from the UWEX East-Metro Region, to evaluate the cleanliness and sanitation of calf rearing environments on 12 dairy farms housing a total of 192 female pre-weaned dairy calves. I utilized an adenosine triphosphate (ATP) meter to identify potential pathogen contamination of calf feeding equipment. Supplemental diagnostic tests aided in identifying the presence and type of disease in pre-weaned calves. Using the gathered data, I provided specific suggestions for improving equipment cleaning and sanitation, and calf equipment management procedures for each farm. I visited each farm in the study twice to collect diagnostic information, complete the sanitation audit, and provide one-on-one consultations. I authored a set of four educational factsheets to aid farmers in interpreting test results and implementing proper calf feeding equipment cleaning and sanitation protocols.

An anonymous, follow-up survey was sent to all participating farms (N=12) approximately one year after completion of the pilot study. One hundred percent of the farms who returned the survey (n=7, 58 percent response rate) changed their calf feeding equipment cleaning and sanitation protocols between the first and second visit and 85 percent permanently changed their cleaning and sanitation protocols. Three farms specifically noted less calf diarrhea, better calf health, and increased calf appetites as a result implementing my management suggestions.

After reviewing my pilot study, Dr. Amy Stanton, former UWEX Dairy Well-Being Specialist, approached me to collaborate on a follow-up case-control calf equipment sanitation study. The case-control study utilized 18 dairy farms representing 860 female pre-weaned calves to quantify the impact of educational intervention on similar-sized dairy farms. The case farms received educational and diagnostic test information after the first visit, while the control farms received educational and diagnostic information after the second visit. The project was funded by a \$2,000 grant from the UW-Madison Department of Dairy Science.

An anonymous, follow-up survey was sent to all participating farms (N=18) approximately one year after participating in the case-control research project. Of the case-control farms who responded (10 farms), 70 percent indicated permanently changing their equipment cleaning and sanitation protocol as a result of the on-farm research study. Seventy-one percent of the farms who permanently changed equipment cleaning and sanitation protocols noted improvements in calf health and productivity. Although the economic impact of the research on individual farms is difficult to document, respondents noted, *"I rarely need to medicate or need a veterinarian's assistance. Calves grow better when healthy. My death rate for 2016 was 3.5 percent and so far this year is 3 percent."* A second farm noted, *"[We] saved \$100 in medications per month."*

Currently, a total of 30 farms have participated in my calf equipment sanitation research studies. These farms represent 10,745 lactating dairy cows from nine counties (Brown, Fond du Lac, Kewaunee, Manitowoc, Marinette, Oconto, Outagamie, Shawano, and Sheboygan). Utilizing survey respondent information, if each participating dairy farm decreased death loss of pre-weaned calves by 0.5 percent, a total of 53 additional calves across the study farms would eventually enter the milking herd. At a value of \$180 per calf (range \$125 to \$235, Equity Livestock Auction, September 26, 2017), this would equate to an aggregated annual total savings of \$9,540. Also, if each farm saved \$100 in medication costs per month, an additional \$36,000 would be saved each year across all 30 farms.

My research on improving calf feeding equipment cleaning and sanitation and the resulting production benefits to the farms have been recognized by agribusiness and educational professionals. Two dairy nutritionists who viewed or participated in my study purchased the ATP technology for their own consulting businesses. Multiple agriculture agents who assisted with my studies have noted an increase in their personal knowledge of proper cleaning and sanitizing of calf feeding equipment. The Shawano County Agriculture Agent, who specializes in agronomy, stated, *"I learned a lot working with Sarah on her study. I am now more comfortable with the proper cleaning and sanitizing procedures, as well as more familiar with the collection of biological samples for testing. This translates to me being more confident when walking into dairy facilities to answer client questions."*

Animal Health and Well-Being

Calf Equipment Sanitation Audits (Continued)

To emphasize the importance of calf care, equipment cleanliness and sanitation to the entire dairy industry, I developed and delivered “Your Mother Was Right, Cleanliness is Important to Calves”, reaching 422 individuals at 12 local, regional, state, and international meetings. Post-presentation evaluations (n=80) indicated an increase in respondents’ knowledge of the importance of cleaning to improve calf health (range +0.66 to +1.80, average +0.92), (Likert scale, 1=low to 5=high). Seventy-seven percent of survey respondents indicated they would implement equipment cleaning/sanitation monitoring and/or protocols on their farm. Survey respondents also overwhelmingly responded the information was relevant and they would use it on their farm.

Currently, data from the pilot and case-control studies is being statistically analyzed and interpreted. To further disseminate my research findings, I will co-author multiple manuscripts for peer-reviewed journals, as well as continue to produce educational articles for the dairy industry. I will also continue to explore the use of the ATP meter within the dairy industry to improve animal health and well-being.

Nestlé Courses/Heifer Blueprints

In 2014, Nestlé selected UW-Madison to lead their Dairy Farming Institute (DFI) education program located in Shuangcheng, Heilongjiang Province, China. The DFI serves dairy veterinarians, animal health workers, animal health managers, herdspersons, and animal nutritionists from across China, as well as dairy professionals from Thailand. UW-Madison Department of Dairy Science personnel were tasked with establishing learning objectives and core competencies, curriculum design, program planning, and evaluation of training programs and trainers.

Dr. Pam Ruegg, UWEX Milk Quality Specialist, requested my involvement in the project, even though no county agents had been involved prior. I partnered with Ed Kreykes, DVM, to collaboratively develop and teach a 40-hour, five-day veterinarian-focused course covering health management of calves and youngstock, as well as a separate 24-hour, three-day course for animal health workers at the DFI facilities in China. Each course consisted of lectures/PowerPoints, factsheets, hands-on experiential exercises for groups and individuals, and written assessments delivered both in the classroom and on-farm. Information from my “Your Mother Was Right, Cleanliness is Important to Calves” presentation was used in the curriculum. I also designed a hands-on interactive laboratory assessment on using the ATP technology for calf equipment cleaning and sanitation evaluation. In addition to DFI students, we also instructed senior DFI educational trainers on the use of course materials for future DFI animal health worker trainings. Overall, 36 students from China and Thailand, two DFI senior educational trainers, and four allied animal health business professionals attended our courses.

Course evaluations were conducted by DFI personnel and hard copies of the results were not made available to instructors. However, a DFI senior educational trainer personally shared I achieved very high teaching ratings as compared to previous courses and instructors. The trainer stated my teaching was evaluated using a standardized, anonymous, Nestlé-developed survey (Likert scale, 1=poor to 5=excellent) and I received teaching evaluation scores of 4.87 and 4.89 for quality and relevance in the veterinarian-focused and animal health worker-focused courses, respectively. One of the course evaluators and allied business partners from Bayer Animal Health, Josh Liu, personally commented, “*You are an excellent teacher who connects with the students. I can see you are very passionate about your subject matter.*”

Resources created for DFI were adapted for use in Wisconsin with the assistance of other UWEX Agriculture Agents. Nine resulting calf health factsheets, known as “Heifer Blueprints” are located on the UWEX Dairy Calf and Heifer Management website at <https://fyi.uwex.edu/heifermgmt/>. Factsheets are available in English and Mandarin and are currently being translated into Spanish. The factsheets will become part of the updated, statewide Dairy Workers’ Training, Module 3 - Calf Management Skills curriculum.

Farm Modernization

It is estimated 12.4 percent of pre-weaned heifers are treated for respiratory diseases, the second leading cause of death of dairy heifers of all age groups (NAHMS, 2011). Lack of proper air movement within barns is a major contributor to respiratory issues.

During 2016, I designed positive pressure ventilation tubes for five farms. A Town of Grover, Marinette County farm sought my advice on the ventilation of their current and proposed freestall barns. Following my advice, ventilation fans were properly installed within the freestall barn housing the milking herd, as fans were not present before consultation. The fans cooled the barns, reduced animal stress, and circumvented the 10 to 15 pounds of milk per cow per day production depression normally experienced during the summer months. The farm’s co-owner, who is also an independent dairy nutritionist, cited significant animal health and financial benefits of installing the ventilation system, “*Conservatively those fans saved us \$15,000 in lost revenue in the first summer we used them, that is more than the project cost ... So, our reproductive efficiency was dramatically impacted as well. The past summer we have seen our first service conception rates running in the high sixties and low seventies. That will certainly roll over into additional income opportunity for the farm.*”

Animal Health and Well-Being

Farm Modernization (Continued)

In the fall of 2016, the same farm, Town of Grover, consulted me to design a positive pressure tube ventilation (PPTV) system to improve post-weaned calf health. The farm installed the PPTV system in July 2017. Their initial impression of the ventilation system is positive, “*Now that we are moving into the third month of use I can confidently share that I have only treated one calf for pneumonia in the barn. In terms of my record keeping, we were initially at a 4% treatment rate for respiratory disease and are currently running at a <1% rate.*”

Per the suggestion of Dr. Dave Kammel, I completed training through the University of Wisconsin-School of Veterinary Medicine, Food Animal Production Dairyland Initiative in April 2017 to gain expertise in the design of barn ventilation systems. With this training, I became a certified ventilation system consultant through the Dairyland Initiative.

Animal Pain Management

Animal welfare concerns exist regarding painful procedures performed on young dairy animals. The public perception of these procedures has resulted in greater scrutiny of all animal management practices. In order to address these issues, Sandy Stuttgen, Taylor County UWEX Agriculture Agent, and I developed and presented “Managing Pain in Youngstock” at the 2016 UWEX Wisconsin Dairy and Beef Well-Being Conference at UW-Platteville. The conference audience was composed of 38 adult learners, as well as 38 high school student learners. The presentation was recorded by Wisconsin Public Television and aired on November 30, 2016. It is archived on University Place at <https://wpt.org/University-Place/managing-pain-youngstock>. A 10-question pre-post test queried participants’ knowledge of specific topics from our presentation. Based on a passing scoring of 70 percent or higher, 90 percent of the youth participant group achieved a passing score after attending our presentation compared to 57 percent achieving a passing score on the pre-test (42 percent increase).

To further provide education on pain management, I collaborated with Sandy Stuttgen, Heather Schlessler, Marathon UWEX Agriculture Agent, Luke Peterson, former Northcentral Technical College Animal Science Instructor, and UWEX videographer, Dave Luciani, to create three videos - “Dehorning Calves using Pain Mitigation Techniques”; “Proper Use of Bovine Esophageal Feeder”; and “Proper Use of Pain Mitigation in Castration”. I assisted in directing the videos, developed the script for “Proper Use of Bovine Esophageal Feeder,” edited the two other scripts, and obtained funding for the video production through a \$4,860 grant from the University of Wisconsin Center for Agricultural Safety and Health County Farm Safety. These videos, available on the UWEX Dairy Team YouTube Channel, have a combined 287,554 views as of August 30, 2017.

Milk Quality

The dairy industry is committed to producing safe, abundant, and affordable milk and meat. When dairy animals are ill and treatment is necessary, farmers and veterinarians must use drugs judiciously, while adhering to label restrictions. Drug residues, or the persistence of a medication within a food product above acceptable levels, may result from a myriad of causes—improper administration of animal medications, improper treatment records, or an accidental oversight by the farmer or farm worker. Regardless of the cause, drug residues should not occur and earnest precautions are necessary to assure foods meet drug residue guidelines.

To aid dairy farmers in eliminating drug residues, regional milk quality meetings were held in Oconto, Kewaunee, and Fond du Lac Counties. UW-Madison state specialists, Dr. Pamela Ruegg and Dr. Doug Reinemann, and a local UWEX agriculture agent presented at each meeting. I developed the local agent presentation, “No Residue Left Behind...Utilizing Treatment Records” and shared the presentation with participating counties. Program attendees who completed the program evaluation of my presentation materials (n=28, Likert scale, 1= low to 5= high) cited an increase in their knowledge of strategies to reduce drug residues in milk and meat, specifically enhanced recordkeeping (+1.2). Based on the post-meeting survey, multiple attendees noted they will adopt changes to their drug record-keeping system.

To further improve milk quality in Oconto and Marinette Counties, I consulted with three farms, including site visits with Dr. Pam Ruegg. All visits involved extensive evaluation of farm protocols, equipment, records, and worker management to provide effective, reasonable, and sound recommendations for improving milk quality. Because of the consultations, one farm implemented on-farm milk culturing to properly identify mastitis-causing pathogens in their herd and to treat mastitis in a timely manner. I provided the farm with training on sample collection, culturing, and colony identification. As a result, the farm is more responsive to their mastitis issues.

Veterinary Feed Directive

My 2014 Needs Assessment Survey identified dairy calf and heifer management as a priority concern for local farmers. Past management of youngstock included the use of prophylactic antibiotics in feed to ubiquitously treat pending diseases, often ineffectively, leading to potential antibiotic resistance in pathogen populations. In 2016, the Food and Drug

Animal Health and Well-Being

Veterinary Feed Directive (Continued)

Administration published the final rule revising the Veterinary Feed Directive (VFD) regulation, implementing the need for active veterinary oversight of the use of antibiotics in all livestock feed. Based on personal communications, the need for education on the new regulation and the implications to farmers, veterinarians, and feed suppliers was identified in the county and across the state.

In response to this need, I developed and presented information on the impact of the VFD regulation on the agriculture industry at seven local and regional meetings for 158 attendees. Through a post-meeting evaluation at four sites (n=100), farmers and agribusiness professionals indicated an increase in knowledge (range +0.90 to +1.56, average +1.33) (Likert scale, 1=low to 5=high). Additionally, I authored a standalone, supplemental factsheet to complement my presentation. This factsheet was shared by other UWEX agriculture agents in their local newsletters and at meetings (estimated 2,500 copies distributed). The factsheet is also posted on the UW Dairy Extension Resource webpage for access by the general public. To further disseminate the materials, I used the factsheet information for my authored articles for *WisContext* and local and statewide newspapers. According to the Editor of *WisContext* (personal communication, August 30, 2017), my article was viewed 187 times with an average time on page of 7 minutes, 42 seconds. The VFD materials I created were also shared via other media outlets, including podcasts and radio spots, to an estimated 500 individuals.

Due to the complexity of the VFD information, along with the need for youth livestock producers to understand and follow these regulations, I co-authored a supplemental factsheet for 4-H and FFA livestock exhibitors with Bernie O'Rourke, Alyssa Grenawalt, Beth Heinze, and Nikki Lennert, faculty and staff in the UW Animal Sciences Department. This factsheet was included in the 2016 4-H and FFA Meat Animal Quality Assurance curriculum and at 2016 4-H Area Animal Science Days. Additionally, the University of Nebraska utilized the factsheet for their youth educational materials. To date, an estimated 620 copies of the factsheet have been distributed.

As part of the UWEX Dairy Team, I have presented information at numerous calf and heifer management meetings for farmers, agribusiness professionals, and educators across the state. To gauge the impact of my statewide programming in calf equipment sanitation and the VFD, a post-meeting evaluation was sent to all participants of the 2013 through 2017 UWEX Fall Calf and Spring Heifer Meetings in August 2017. One hundred percent of evaluation respondents (n=17, residents of nine counties) had accessed or utilized one or more UWEX educational resources, including my authored materials on: the veterinary feed directive (65 percent of respondents), calf health monitoring technologies (59 percent), and standardized calf feeding equipment cleaning protocols (53 percent). Sixty-five percent of respondents cited making farm management changes as a result of attending an educational program or utilizing UWEX educational resources. The top three changes made were: increased discussions about the veterinary feed directive with an agriculture professional/consultant (59 percent of respondents), development of treatment records (59 percent), development of standardized cleaning protocols for calf feeding equipment (29 percent), and/or development of written treatment protocols (29 percent). Forty-one percent of respondents indicated an increase in farm productivity from implementing the cited management changes. They identified the top increases in productivity as: decreased cow or calf death (35 percent of respondents) and/or decreased cow or calf sickness (35 percent of respondents).

Animal Husbandry

During the summer of 2015, Sandy Stuttgen and I completed a literature review of bovine gastrointestinal parasitism and developed the presentation, "Deworming: Relationships, Resistance, and Refugia", for the UWEX Beef Cow Calf meetings held in seven Wisconsin counties during fall 2015. Sandy Stuttgen presented at four meetings and I presented at three. Printed information on parasite management was provided to all 250 meeting participants. Each site conducted pre-post evaluations of attendees' learning. Respondents on post-meeting evaluations where I presented (n=46) increased their understanding of parasitism and anthelmintic use by +1.5 points (Likert scale, 1=low to 5=high). Seventy-six percent of respondents planned to implement one or more of the emphasized management strategies: revision of deworming protocols, evaluating parasite treatments with their veterinarian, or identifying the class(es) of anthelmintic(s) used on their beef operation.

Additionally, Sandy Stuttgen and I co-authored an "A-series" UWEX publication entitled "Gastrointestinal Parasites and Cattle in Wisconsin: Understanding and Managing the Relationship," which can be accessed through The Learning Store. UWEX colleagues have shared the article at meetings and through newsletters, with an estimated distribution of 400.

Digital dermatitis (DD), also known as hairy heel warts, is a debilitating and profit-robbing foot disease affecting both beef and dairy cattle. Due to pain and subsequent lameness, dairy cattle experience decreased milk yield, while beef cattle suffer from weight loss. Additionally, both dairy and beef animals experience lower fertility. Research indicates 70 percent of all United States dairy herds have DD (Döpfer, 2016), while the incidence of DD in beef herds is unknown (Schaefer, 2013).

Animal Health and Well-Being

Animal Husbandry (Continued)

An on-farm research project was completed by the East-Metro Region UWEX agriculture agents to determine the prevalence of the three primary stages of DD and hoof health management practices on eastern Wisconsin dairy operations. Aerica Bjurstrom, UWEX Kewaunee County Agriculture Agent, led the project. I assisted with grant writing, research design, and on-farm data collection. To supplement the project, I co-wrote a factsheet with Eric Ronk, former UWEX Calumet County Agriculture Agent, stressing the importance of developing and implementing an effective record-keeping system for DD. This factsheet formed the basis for an article I co-wrote for *Progressive Dairymen* (N=28,655 circulation) entitled “How record-keeping can impact hoof health”.

In order to increase beef farmers’ knowledge of DD, I developed and presented, “Finding Your Foothold on Digital Dermatitis” at a local cow-calf meeting in fall 2017. The presentation highlighted the signs of the disease, the technologies available to record hoof health information, and the proper method of hoof wrapping. Survey respondents (n=7) cited increased knowledge (+1.15, Likert scale of 1=low and 5= high). Additionally, Dr. Dan Schaefer, professor of UW-Madison Animal Science, who was also presenting at the meeting, asked for an electronic copy of my presentation. He stated, “*I will cover this topic in my [UW-Madison] beef production class.*”

Professional/Agency Personnel Training

Dr. David Kammel asked me to teach a class on animal welfare basics during his 2015 and 2016 UW-Madison Farm and Industry Short Course entitled, “Livestock Housing”. My lecture focused on research-based, animal well-being information and incorporated real-world evaluation tools for young dairy professionals. A teaching evaluation completed by Dr. David Kammel highlights my ability to talk to diverse audiences and difficult subjects, “*She is very enthusiastic, energetic, and knowledgeable about the subject and handled the difficult questions on practices that some students did not feel to be an issue. She explained why the practices may have to change and how to manage the situation.*”

In addition to my consultations with farmers, I also strive to provide quality professional development opportunities to agriculture industry professionals. In September 2015, I co-taught “Calf Health and Housing” with Amy Stanton and Aerica Bjurstrom to 30 Wisconsin Department of Agriculture, Trade and Consumer Protection animal health inspectors and state veterinarians. We also provided hands-on training regarding calf health and housing, specifically benchmark scoring protocols for determining calf health.

In 2016, I was invited to speak on “Optimizing Reproductive Strategies” to 17 Japanese dairy professionals visiting Green Bay and surrounding dairy farms. Also in 2016, I was invited to speak to 18 Extension state and regional specialists from Minnesota, Iowa, Illinois, and Wisconsin about the on-farm use of calf equipment sanitation audits. Additionally, I taught cold weather care for calves to the Oconto/Marinette Farm Service Agency personnel. My teaching efforts with the FSA were well received based comments on from my performance feedback survey. “*Sarah has met with our [USDA Farm Service Agency] County Committee on more than one occasion to discuss upcoming activities, meetings and work projects. On one occasion she provided expert advice and guidance on the subject matter [the effects of adversely cold weather on cattle/calves]. She is very knowledgeable, friendly, professional, and approachable.*”

Farm Financial Health and Management

Farm Succession

According to the 2012 Census of Agriculture, the average age of farmers in Oconto and Marinette Counties was 56.4 and 58.3 years of age, respectively. Currently, there are 129 and 66 dairy farms in Oconto and Marinette Counties, respectively. Across the country, the USDA estimates 70 percent of farmland will change hands in the next 20 years (National Institute of Food and Agriculture, 2017). Therefore, successfully transferring farms to the next generation will be a necessity to ensure the vitality of the agriculture industry.

Farm succession is a complex, multi-faceted process, requiring consideration of a variety of topics such as profit margins, land value, farm size, and tax rates. Farm succession is often a laborious process, requiring strategic planning and open communication between all parties. To begin addressing these issues, I authored an article on farm succession for the *Oconto County Times Herald* in summer 2015. An Oconto County Farm Bureau member was impressed by the article and I was contacted by the Oconto County Farm Bureau to speak at a local farm succession meeting. In response, I developed, with Joy Kirkpatrick, Farm Succession Outreach Specialist with the UW-Madison Center for Dairy Profitability, a presentation entitled, “Farm Succession – What, So What, Now What?” for use at the Oconto Farm Bureau meeting. After my presentation, the Farm Bureau District representative requested my presentation be used as a wrap-up for subsequent regional farm succession meetings. I shared my presentation with Jamie Patton, Shawano County Agriculture Agent, and Tina Kohlman, Fond du Lac County Agriculture Agent, for use at their county’s farm succession meetings, reaching an additional 70 individuals.

Farm Financial Health and Management

Farm Succession (Continued)

As farm succession was identified as a topic of high importance in my 2014 Needs Assessment Survey, Scott Reuss, Marinette County Agriculture Agent, Joy Kirkpatrick, and I offered a two day “Returning to the Farm” meeting as a follow-up to the Farm Bureau meeting in fall 2015. “Returning to the Farm” offered participants (N=3 farms, 7 individuals) an opportunity to discuss issues facing multi-generation farm families living and working together, farm business arrangements, personal goals, and financial challenges. The program provided families the general information necessary to plan the entry of the next generation into existing farm operations and furnished a resource packet with worksheets, exercises, and pertinent information. I developed and delivered two presentations at the meeting, “Overview of Farm Succession Planning” and “Financial 102—Using Financial Information to Plan”.

A post-meeting evaluation for each day of “Returning to the Farm” was utilized to gauge the usefulness of each topic area and to design follow-up discussions to best meet the needs of participants. Evaluation responses indicated 100 percent (n=7) of respondents increased their knowledge of the farm succession process and will pursue succession activities on their farm. Evaluation of my presentations (Likert scale, 1=low and 5=high) indicated I had a positive impact on learning, “Overview of Farm Succession Planning” (+1.17) and “Financial 102—Using Financial Information to Plan” (+0.66).

In 2016, I hosted a multi-county farm succession workshop for 20 individuals to serve the expressed needs of the Oconto, Marinette, and Shawano County farm communities. I planned and facilitated the meeting, as well as presented on effective family communications. As a result of the meeting, nine participants indicated they planned to initiate farm succession conversations with their family and/or seek consultation with an attorney or tax professional. Survey respondents (n=18, 90 percent survey response rate) indicated a +1.23 point (Likert scale, 1=low and 5=high) increase in their knowledge and understanding of communications after my presentation “Farm Succession Planning”.

As a follow-up to my 2016 multi-county meetings, I coordinated another farm succession meeting for Oconto, Marinette, and Shawano Counties in March 2017. The “Ensuring a Farm Legacy” farm succession meeting and estate planning workshop drew 18 participants from all three counties. Post-meeting surveys (n=9) indicated an increase in respondents’ knowledge of UWEX farm succession resources after my presentation “UWEX Farm Meetings” (+1.23, Likert scale, 1=low and 5=high).

After the 2017 farm succession meetings, a farm family sought my assistance to begin their farm transfer process. I organized individual meetings between the older and younger generations with Joy Kirkpatrick and will work over the next few months to hold joint family meetings to identify financial, legal, and communication requirements for a successful farm transfer. Additionally, I have facilitated farm succession conversations between two local farm families. During the farm meetings, I assisted with the development of a household budget, reviewed and edited written communications between the farm and a potential successor outlining specific contractual arrangements, and forged improved verbal communication between husband and wife. Although these farm succession meetings did not result in the transfer of assets, the meetings were successful in that a non-viable farm transfer option did not transpire and an approximate \$100,000 reduction in the fair market value of the farm was not pursued, thus maintaining farm assets at their full value for the farm owners.

Based on the continuing programmatic need of farm succession within Oconto County, I wrote a letter of support for Joy Kirkpatrick to successfully secure funding through the North Central Risk Management Center to develop a farm succession workbook for farm families. I am currently one of seven members on the workbook development team and will facilitate a focus group in my area consisting of farm families who have completed a farm succession to identify efficient processes and protocols for successful farm transfers.

Employee Management

Being able to effectively manage employees is critical to the success of any agribusiness. Developing management skills is often difficult and time-consuming for the farm owners, as well as mid-manager employees. Many farm managers began their careers as general farm laborers and have transitioned into managerial roles without undergoing training on employee management. To address this need, Tina Kohlman, Liz Binversie, Brown County Agriculture Agent, Aericia Bjurstrom, Heather Schlessler, Elsie Gonzalez, former Dodge County Agriculture Agent, and I, developed two, two-day bilingual farm management workshops. I co-developed a presentation with Tina Kohlman on conflict management entitled, “Using Style to Manage Conflict”. Based on post-meeting evaluations (n=76), 65 percent of respondents indicated the workshop was of value and should be offered again. Six months after the initial meeting, five workshop participants were interviewed to document the long-term, educational impacts of the training. The five individuals managed 34 employees and had 22 years of combined management experience. Four of the five participants indicated they used the information from the training “a lot” or “quite a bit”. Recognizing the success of workshops, the meeting design and curriculum was adapted by fellow UWEX agriculture agents to create a similar program entitled “Becoming the Employer of Choice”.

Farm Financial Health and Management

Farm Business Development

Business plans are vital to young farmers seeking to secure loans to initiate or expand their businesses. I provided one-on-one consultation to three local farms to aid in a business model development. Because of my budgeting consultation, an Oconto County resident secured a start-up loan to pursue his dream of owning a dairy farm. He currently owns and milks 40 cows and is looking to purchase 10 additional cows. His herd is estimated to contribute \$1.36 million in income to the state's economy annually (\$34,000 per cow per year) (Deller, 2014). To help develop his farm and management skills, I am organizing and will lead quarterly farm management meetings. These meetings will serve to facilitate discussions between the farmer and his bank loan officer, nutritionist, and veterinarian to identify farm goals and the management strategies necessary to meet those goals.

To address questions from local farmers on direct marketing, I developed a presentation entitled "Are You Set Apart? Beef Direct Marketing" for the eight 2016 Beef Cow Calf meetings. The scripted presentation was shared with and used by local agents hosting the meetings. Eighty-four individuals attended the meeting where I presented and 23 percent (n=19) completed a post-meeting evaluation. Respondents reported an overall increase in knowledge of direct marketing strategies (+1.0, Likert scale, 1=low and 5=high). Additionally, in my 2017 overall program feedback evaluation, an anonymous respondent indicated they increased their profit by \$100 per head using the information I provided in my presentation.

In 2016, I initiated the Mid- and Early-Career Dairy Producers and Agribusiness Professionals group for individuals residing in Oconto, Marinette and Shawano Counties. The purpose of the group is to provide an environment for collective learning, sharing, networking, and problem-solving. This group has met on an infrequent basis over the past two years. The topics, host locations, and guest speakers are chosen based on the need and suggestions of the group. Overall, the group has been successful in bringing up to 15 farm and industry professionals together for educational programming ranging from securing farm loans to the basics of genetically modified organisms. I have led all eight meetings and taught a session on gastrointestinal parasites.

Overall Reflection and Summary

The change in my career from the private to public sector has been extremely rewarding. My mission in life, regardless of my employment position, has always been the same—to serve others. Prior to my career with UWEX, I considered it a privilege to know my clients on both a personal and professional level. This commitment and mission remains steadfast, as I continue to serve many of the individuals I knew from my former career and seek to expand my professional circle throughout Oconto County and the state.

UWEX is an invaluable resource for Wisconsin farmers and community members, and as part of that resource, I am valued by those in the county. Written comments on my performance feedback survey attests to this. One respondent wrote, "*Sarah is a valuable resource for us in the county with a wealth of knowledge.*" Another cited, "*Sarah is willing to go above and beyond to provide excellent customer service. She will sacrifice her own personal time to ensure clients receive the information and assistance they need and/or desire. The depth and extent of her knowledge, as well as her ability to communicate that information effectively to clients, makes her one of UWEX's most valuable county resources.*"

My on-farm research, literature reviews, and one-on-one consultations in calf equipment sanitation, deworming, veterinary feed directive, and farm succession have enhanced my appreciation for creative scholarly work. I experienced first-hand how the development of these topic areas into presentations, factsheets, and newspaper articles exponentially increased the value of my work, by increasing not only its quality, but also the number of individuals impacted. Evaluations and awards have affirmed that my work is valued by farmers, industry professionals, UWEX, and extension professionals nationwide. Through my research, I have translated my education and professional experience into increased profitability for dairy farmers in Northeast Wisconsin, impactful and high quality educational programs for the agriculture industry, and increased institutional knowledge for UWEX.

The Wisconsin dairy industry is a strong economic driver for the state. However, if current economic trajectories persist, farm profit margins will continue to tighten without strong educational interjections to improve production and financial efficiencies. As an educator with UWEX, I play a unique and key role to continued farm success by providing relevant, research-based information to decrease farm production costs, decrease costs associated with animal health, and streamline farm inputs, as evidenced by the impacts of my on-farm research, one-on-one farm consultations, and educational programming efforts. I will continue in developing both current and future educational program efforts in animal health and well-being and farm financial health and management to meet the needs of my clientele.

UWEX provides me the platform to provide pertinent educational information to local, state, national, and international clientele and the flexibility to conduct research on topics I am passionate about. My career with UWEX is a perfect blend between my education, experience, and life's mission. I have and will continue to strive for excellence in developing the academic knowledge required to serve the residents of Wisconsin.