PROCEEDINGS OF

HIGH PLAINS DAIRY CONFERENCE

March 1 – 2, 2016

Edited by: **Ellen R. Jordan, PhD**
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The Texas A&M University System

Managing Entity: **Texas Animal Nutrition Council**

High Plains Dairy Conference

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High Plains Dairy Conference Proceedings
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Videotaping of the programs is not allowed.
Author's permission is required for the use of their visuals.

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Industry Presentation - Technology on the Dairy Farm – So What's All the Fuss About?

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The implementation and utilization of technology has exploded into our lives the past 5 yr at a rate that we have never before witnessed. Depending on the region and economic scenario, technology has entered into agriculture such that both young and old alike are making decisions based on information from apps or gadgets. Instead of going to a library and taking days to compile research, many read information on the internet in ¼ of the time. However, still a significant amount of time must be devoted to filtering out irrelevant information, such that only quality information is used. Here is the challenge of data and information in the new world.

The reasons for buying technology may be economics, labor efficiency, fascination with a new technology, or emotional (75 % of the driver for personal purchases). We always speak in the dairy industry of economic reasons, but there is much more to it. One clear criterion is that the relationship with the local dealer is critical. The dealership must have well trained staff with a support network backed from the corporate level.

In the past, hardware was more apt to be hardware. Nuts and bolts and a lot of steel with motors, pumps, hoses, and lines were sold and installed. It had minimal options on settings. Today the hardware includes not only these traditional components, but much more with the entry of sensors, readers, and electronics managed by software. The software is two-fold in dairy farming, which makes it more complicated than even cell phone software. The software runs the milking equipment and it is a tool in the toolbox to help dairy producers and their staff manage their cows.

If you are currently a producer with minimal parlor technology, i.e. no milk meters or automatic take offs, the argumentation and the preparation for updating a parlor with just these two additions may appear simple. However, without proper preparation this first step could end up in a great deal of frustration. All parties involved should know why the changes are being made. Is it for increased returns through finding cows that are not paying for themselves or have a health issue and therefore are not producing? Return over feed costs is a key driver and cows producing below your breakeven are a drain on this equation.

If you want to improve labor efficiency and even udder health then automatic take offs are a logical choice. But if vacuum and flow settings are not discussed and necessary modifications explained, after a few cases of mastitis quick negative reactions from team members questioning the change may compromise teachable moments. It is always better to understand what the changes will be, and who to call if results on the farm are different than expected. This keeps everyone's attitude positive. Then any challenge, no matter how smallor big, is worked through in a more positive manner.

Another group of dairy producers may find that they have tools but are not using the software to analyze parlor

performance, udder preparation, and personnel performance. Who at the dealership can support a training request or can they call upon the corporate level to bring in regional support? Software should be used so that owners/managers can monitor their ability to train or provide training for the staff. If the staff view it only as a tool to punish them, then negative attitudes can develop. If discussions begin with how to use software to improve people's work experience and how it can benefit everyone with benchmarks better set to aid in either a bonus structure or improved training then perhaps more positive attitudes help in a smoother transition. Remember the radio station WIFM – "What's in it for me?"

What if you are always leading the pack and looking for new or different ways? You may be looking for technology to replace what people do now or for technology that can do it more cost effectively over a 5 to 10 yr period?

- One example would be a teat robot sprayer. The work force is changing and the pool of workers for certain jobs may no longer be available, you will need tools that allow people to work in a different manner.
- Another example of this may be automated calf feeding, instead of mixing and delivering milk, the role changes to managing and monitoring calves and to ensure that the calf feeder is working/cleaning properly and that the environment (ventilation, housing) supports success with this technology.
- A third reason could be that you are listening to the consumer and regardless of what you believe; they are applying pressure through their buying trends or their social voice to influence what you are doing. An example would be utilizing activity systems in combination with sync programs to reduce the dependence on 100 % **TAI** (timed artificial insemination). Someday technology such as Herd Navigator ™ (DeLaval, Bannockburn, IL) that measures progesterone will be used so the hormones in TAI programs are only given to non-cycling cows. With a technology like Herd Navigator, that also measures metabolites for metabolic disease and udder health, you quickly identify abnormal cows and your team has a tremendous tool to work to minimize these cows.

Henry Ford was quoted to have said, *"It is not the employer who pays the wages. Employers only handle the money. It is the customer who pays the wages."* If we don't listen to the consumer (ultimately everyone's customer) of milk and milk products we may find ourselves with additional struggles in marketing our quality products. While the safety of what we do is not the issue, the perception by the consumer regarding products used in or on our animals is that some of these products are. I have slowly accepted that this must be a part of my vision.

In preparation for the new technology coming to your farm you must decide when or how you are going to start to bring the staff into being a part of it. Too often with companies, staff tend to be told what is about to happen. We know that the initial response after a surprise or lack of information can be negative. Depending on the staff's perception of what it will do to their life, they may

begin the process of sabotage quite early in the process. On the other hand if discussions begin early and bring in the opinions of key managers you can start the process of a successful integration.

If technology can make life easier from a physical perspective, most people welcome the addition. However, there may be an automatic fear of lack of ability to manage the new technology and/or a greater fear that the technology may lead to their dismissal. If employees can't read or write, will the new technology mean that they will *"for sure"* lose their job? Also is the owner's understanding of the technology in line with the reality of how the key managers understand it and with realistic results in the first year compared to 3 yr or more? I have witnessed some owners misunderstanding what the technology can do, and because as an owner they don't work with it on a daily basis, there can be surprises months after the installation. We are a society of wanting instantaneous results; therefore proper training and understanding are key to knowing how to benchmark results.

The last part of this team that can really advance the use of the new technology or potentially hold it back from its potential is the role of the advisors in your dairy operation. Are your advisors supportive of new or different technology? If yes, bring them into the training process. Ensure that they understand how the technology will work and what the benchmarks are for changes in productivity, standard operating procedures, or work efficiencies. I have participated with dairy producers who have advisors as excited as they are about the new technology. These meetings are very productive; and the on-farm results are reflective of this. I have also participated in meetings where advisors have been extremely critical or worst non-participatory. Consequently the ability to go forward with the technology is compromised. If you have made the decision to move forward with technology, please ensure that your advisory team is supportive.

In summary:

1. Why are you buying the technology?
2. What is it that you want to know from this technology and what do you want to do with its mechanical benefit or the data that comes out of it?
    a. What are practical benchmarks to achieve the results that you would like?
    b. Are your staff or key managers a part of the decision making or is it *"Do as you are told"*?
    c. Is your advisory team a part of this decision making and what role will they play in designing rations or standard operating procedures because of the change in technology or because of the data coming from technology?
3. How much support does this new technology require?
    a. Too often quotes just state *"support";* however it should be clearly stated what the default support is, who provides that support (their qualifications), and an approximate estimate of the time.
    b. Does this support come locally and how do they work with the corporate support should more or different questions arise? It is a fine

balance between having great local support and having someone at the corporate level answer those *tough* questions.

There doesn't have to be a lot of fuss with new technology. There will be some, but it can be managed if the right questions are asked beforehand and everyone with a stake in the results feels like they are a part of the decision and part of making the technology work. While price is important with technology; preparation, knowledge, and support are equally critical and cannot be compromised.

Industry Presentation - Selecting for Low Heritablility Traits

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The dairy genetics landscape has changed over the last 20 yr. Selection for traits with low heritability was discouraged before this time as little progress could be realized. With better data collection, analysis techniques, and now most importantly the advent of genomic testing, these low heritability traits have become common place in selection emphasis points for most dairies.

When looking at low heritability traits, most have a heritability of less than 10 % according to the Council of Dairy Cattle Breeding (**CDCB**) website. This means that environmental effects explain over 90 % of the variation and genetic differences are responsible for the rest. With genomic testing, we can now have more reliable estimates for young bulls and heifers for these low heritability traits.

Traits like Daughter Pregnancy Rate (**DPR**), Heifer Conception Rate (**HCR**), and Daughter Stillbirth (**DSB**) are now used frequently among industry index rankings for bulls and cows. According to the CDCB, DPR heritability is estimated at 4 %, HCR is at 1 %, while DSB is at 7 %. We have seen progress, and in the case of DPR rapid progress, in genetic and phenotypic response. We will examine how these traits are ranked and used in herds to achieve this progress. For example, for herds that are genomic tested, we can see that genetically superior cows (top 25 % of the herd for genomic estimates for DPR) have a 10 to 15 % advantage over those in the bottom quartile for genomic DPR ratings. Additionally, we will take a look at a few other low heritability traits and the future opportunities that they offer for us that are not currently available.

In summary, the dairy genetic industry has historically done a fantastic job of increasing easily measured and recorded traits. The future holds even more promise as we develop more and more tools to place genetic selection on areas of the dairy where we have not been able to utilize this area of improvement previously.

Bridging the Gap between the Beef and Dairy Industries – A Packer Perspective

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Over the past several years, effort has been put forth within the agricultural industry to bridge the gap between the beef and dairy industries concerning the value of a cow as perceived by the different agricultural sectors. In a dairy cow's lifetime, she contributes to the food industry in a variety of ways, primarily providing milk, but also importantly serving as a source of meat within the beef supply chain. In 2015, approximately 28 million cattle were processed in federally inspected meat plants in the United States and 10 % of those animals were market dairy cows, representing a significant portion of the supply chain (USDA, 2015).

One of the challenges that the beef and dairy industries face is finding a common understanding of when the value-gain of production on-farm changes to the value-gain of the market animal at the packing plant. Identifying where this value tipping point lies is subjective and is impacted by many variables; understanding these impacting variables needs further focus and collaboration between all segments of the value chain. Even though fluid milk is the main income for a dairy farmer, the sale of market cows and bulls does provide an additional source of income. Unfortunately, these market cows and bulls are often taken out of the herd for a reason that can often directly, or indirectly, impact the quality of the animal/carcass, such as arthritic joints, inadequate muscling, potential sickness, lameness, and bruising. Many of these quality defects also negatively impact animal well-being. It is important for both the beef and dairy industries to understand and explore ways to improve the quality and well-being attributes of animals that are culled and marketed.

The 2007 National Market Cow and Bull Beef Quality Audit (**NMCBBQA**) identified that market dairy cows, compared with both beef cows and dairy and beef bulls, had the greatest number of visible defects (e.g. cancer eye, udder defects, etc.) observed in lairage at the packing plant (Hale et al., 2007). As a result of some of the information gathered in the 2007 NMCBBQA, a survey was conducted at auction markets to document the prevalence of several quality traits in market cows and bulls in the auction ring (Ahola et al., 2011). The survey also assessed whether or not the quality traits identified had any impacts on purchase price of the animals (Ahola et al., 2011). Ahola et al. (2011) determined that the following traits resulted in discounted purchase prices of dairy cows at the auction markets included in the study:

- Extra-large udder,
- Visibly sick,
- Surgical evidence,
- Cancer eye,
- Foot abnormalities,
- Low body condition score (< 3),
- Mastitis,
- Lameness,
- Reproductive defects, and
- Hip sores.

Although many of these traits are common reasons for culling, many of them, depending on the severity, are causes for

concern as they can negatively impact the state of well-being of the animal. Many of these traits may also decrease the animal's likelihood of making it through the marketing process and some of the additional stresses related to that process (i.e. loading, transportation, unloading, lairage, etc.).

When purchasing a market cow, a cattle buyer is thinking about several variables with quality, animal welfare, and price among them. Determining the value of a market cow, from a packer perspective, takes into consideration:

- Market demand (i.e. number of animals to purchase, type of animals to purchase),
- Animal condition (i.e. does the animal exhibit any characteristics that will likely prevent it from passing ante or post-mortem inspection),
- Animal well-being (i.e. is the animal's welfare impaired and will it be able to withstand the stress of transportation and additional handling), and
- Quality (i.e. although bruising cannot be viewed from the outside, does the animal have any obvious signs of injury or defects that could add to loss of carcass value).

Processors look to purchase animals that fit within their specifications for size and quality, but they also want to purchase an animal that is fit for transport and is in a good state of well-being.

During the 2007 NMCBBQA conducted by the National Cattlemen's Beef Association (**NCBA**), a strategy workshop was held that identified primary directives for the improvement of market cow and bull quality focusing on both increasing value to the producer by minimizing quality defects and improving economic gain, but also to increase value by improving the animal well-being status of market animals, as some of the market cow deficiencies often negatively impact animal welfare (NCBA, 2007). Similarly, during a strategy workshop convened as a part of the 2011 National Beef Quality Audit (**NBQA**), the audit focused on finished steers and heifers, the working group identified the beef industry disconnect with the dairy industry as one of the industry's barriers to progress and recognized the importance of working with the industry to bridge this gap (NCBA, 2012).

There have been several initiatives to unite the animal care programs led by both the dairy and beef industries, as several of the quality issues were present within both industries. In the early 1980s the beef industry responded to increased observations of quality issues such as residues, injection site lesions, and bruises in finished cattle. The concept for the NCBA Beef Quality Assurance (**BQA**) program was developed and since then has grown into the cattle industry's guidelines for maintaining high levels of animal care and resulting meat quality. The Dairy Beef Quality Assurance (**DBQA**) program was subsequently designed in the early 1990s to educate and help dairy producers recognize that the animals they cull from the herd play an important role in the beef food chain. Several years later in 2009, the National BQA program partnered with the National Dairy Herd Association, who had developed a program similar to DBQA, to launch today's program called Dairy Animal Care Quality Assurance (**DACQA**). The management techniques that are discussed in the DACQA program provide information on how to minimize meat quality defects, monitor health, and market cattle in a timely

manner. The dairy industry also has developed animal care programs focusing on best management practices for the dairy animal with some focus on the cull animal as well. Simultaneously in 2009, National Milk Producers Federation (**NMPF**) initiated the creation of the National Dairy **FARM** Program (Farmers Assuring Responsible Management) to demonstrate, and eventually verify, commitment to animal care and quality. This program originally focused more on dairy cow management and quality from a milk production standpoint, but in the past year there has been enhanced collaboration between representatives of the beef industry and NMPF to add more components of beef quality assurance and focus on market cow condition in future versions of FARM.

Efforts have begun on the 2016 NBQA, for which data will be collected for both finished and market cull animals simultaneously. The audit results will provide interesting information about progress that both industries have made in some of the defects that can impact meat quality and animal well-being. Dairy and beef producers alike must accept that they play a key role in ensuring that beef is safe and wholesome for consumers.

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Worker Safety Management on Dairy Farms: Current Issues, Challenges, & Solutions

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In recent years the U.S. dairy industry has seen a heightened emphasis on worker health and safety. Dairy operations in the U.S. continue to have high worker injury and fatality rates as compared to general industry and other agriculture operations. As a result, Occupational Safety and Health Administration (**OSHA**) Local Emphasis Programs (**LEP**) for programmed inspections of dairy farms in Wisconsin and New York have been established. Additionally, dairy-specific safety legislation was introduced in Washington State due to rising injury and fatality rates on dairy farms. As a result of increased attention on dairy farms, producers are evaluating their own worker health and safety management programs.

OWNER-MANAGER LEADERSHIP AND COMMITMENT

The fundamental tenet to any dairy farm safety program is that owners and managers must understand that the safety of employees is an integral component of doing business. Managers must accept the responsibility of stimulating awareness of safety among workers, and also demonstrate a commitment to the safety of workers. Each manager and supervisor must assume the responsibility for the safety of his or her own personnel, and must be given the necessary authority to fulfill that obligation.

A safety program must always start with owners and top management. Owner and manager attitude toward injury prevention is almost invariably adopted by supervisors and employees. If owners and managers are not genuinely interested in preventing injuries, others working on the farm will not be interested as well. Owners or managers owe it to themselves and to their employees not only to promote safety and safe working environments, but also to provide a safety policy with written operating procedures that are aggressively enforced.

A prime requisite for any safety program is to leave no doubt in the mind of the dairy workers that management is concerned about the prevention of injuries on the farm. Owners and manager commitment to worker safety must be demonstrated in the form of a written policy statement and made known to all levels of management and workers alike. This policy should outline the organization's aims and objectives for its safety program and should designate the authority and responsibilities for their achievement. The policy should be given wide publicity and should establish both management and worker responsibilities in the program. The mechanism of delivery of this policy should be as important as the clarity with which it identifies functional authority and responsibility, especially given that the working population in the dairy industry is made up of low-literacy, non-English speaking workers.

The establishment of responsibility for safety at each level of management forges an unbroken chain of accountability from the owner of the dairy down to the supervisor. This accountability must be extended in direct line through each work

area to each worker. Dairy managers must see to it that this responsibility is fully accepted by all workers, and hold supervisors accountable for the safety performance of their respective areas of responsibility.

A common attitude is that safety is everyone's responsibility. This is generally true, but common and statute law dictate that the safety of the worker is a management responsibility. Those in ultimate control of the organization must regard the provision of a safe workplace as a fundamental principle in their relation with their employees. Successful safety programs have one thing in common: there is a deep-seated commitment by top management. Such commitment filters down through the organizational hierarchy to the workers.

EMPLOYEE PARTICIPATION

A second tenet of any successful dairy farm safety program is to ensure worker participation in the safety program. Dairy workers are the first line of defense against safety concerns on a farm. They are on the front lines and they witness more safety offenses and violations than what supervisors can observe. Since workers are often those closest to the hazards, and have the most first-hand knowledge of workplace hazards, they also often have the best ideas for improving safety. Employee participation means that workers are encouraged to participate in the safety program. Clearly, the employer has ultimate responsibility for its workers; however, using employees' knowledge, observations, and experience to help identify and resolve problems can make the system more effective. Examples of how dairy workers can be included in the safety program include:

- Incident investigations
- Procedure development
- Development and implementation of safety training
- Job safety analysis
- Safety and health committee/team involvement
- Safety-specific recommendations

At a minimum, a mechanism should exist for workers to identify and report safety concerns on the farm without fear of reprisal or punishment. These reported issues should be addressed in a timely fashion, which will communicate to workers that safety is a high priority for owners and managers.

HAZARD IDENTIFICATION AND CONTROL

Since owners and managers control all aspects of the dairy including hiring, training, production, quality control, and a variety of other activities common to dairy operations; they must also control the recognition, evaluation, and control of workplace hazards. The same standards for achieving production, quality control, and a host of other dairy-related objectives should also be used for achieving worker health and safety objectives. Managers must be involved in the activities required for planning, organizing, and controlling job-related health and safety activities. All managers and supervisors must be held accountable for all specific safety responsibilities which cannot be delegated downward. To be most effective, the focus of manager safety efforts should be on hazard control, rather than on accidents. The control of hazards on the dairy farm requires the application of good, sound, basic management skills. Cost-conscious farms have learned that they must control injury incidents and their costs if they are to do

business in today's highly competitive dairy market.

EDUCATION AND TRAINING

Training is one of the most important elements of any safety program. Safety training allows employees to learn their job properly, brings new ideas into the workplace, reinforces existing ideas, and puts a safety program into action. Inadequate safety training content and inadequate instruction are two factors directly related to safety training, and can be compounded by a language barrier. Cultural, linguistic, and attitude barriers should be addressed in safety trainings of foreign-born workers. Owners and managers should mandate that all employees participate in safety trainings, and their attendance and participation should be documented.

OSHA mandates that if an employee does not speak or comprehend English, instruction must be provided in a language the employee can understand. Similarly, if the employee's vocabulary is limited, the training must account for that limitation. By the same token, if employees are not literate, telling them to read training materials will not satisfy the employer's training obligation. As a general matter, employers are expected to realize that if they customarily need to communicate work instructions or other workplace information to employees at a certain vocabulary level or in a language other than English, they will also need to provide safety and health training to employees in the same manner. OSHA compliance officers are responsible for checking and verifying that employers have provided training to employees. In addition, compliance officers must check and verify that the training was provided in a format that the workers being trained could understand.

SAFETY PROGRAM RECOMMENDATIONS

Today, it is imperative that owners and managers become involved and participate in farm safety programs because of the vast scope and potential consequences of state and federal legislation dealing with occupational safety and health. The role of safety on the U.S. dairy farm is exemplified by the number and variety of regulations, laws, and court decisions. Therefore, the fundamental elements of a dairy farm safety program include the following:

1) Owners and top managers must provide a forceful and continuous leadership role in the safety program.
2) Work environments on dairy farms must be made safe, free of recognized hazards known to cause injury, illness, or fatality among workers. This involves implementing a mechanism to identify, recognize, and control hazards known to cause injuries, illnesses, or fatalities among dairy workers.
3) Supervisors must be competent and effective leaders to facilitate safe behaviors among workers.
4) Employee participation in injury prevention must be maintained.
5) Supervisors and workers must be trained in the recognition and reporting of safety hazards on farms.
6) Employees must abide by all safety rules and perform their job duties in a safe manner.

RESOURCES

Dairy Farm Safety website with articles written on safety management and farm hazards. https://sph.uth.edu/dairy-farm-safety/

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New Mexico State University Dairy Extension website with information on safety training videos. http://aces.nmsu.edu/ces/dairy/index.html

Managing the Water You Have

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After El Niño, Now What?

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The weather phenomenon that dominated the news this winter was El Niño. For that matter, El Niño also dominated Texas weather this winter. Typically during a moderate to strong El Niño year, precipitation from fall to spring is either near normal or above normal. In the high plains this year, precipitation was near to above normal in most areas, though some spots were unlucky for much of the winter. Conversely, some areas were too wet for extended periods, as late October saw some of the wettest weather statewide on record.

El Niño impacts will continue for the next few months. During March through May, moderate to strong El Niño years average about 30 % wetter than normal in the southern high plains, with only about one in four moderate to strong El Niños being drier than normal. The El Niño enhancement is weaker farther north. Curiously, the two strongest El Niños of the past were both drier than normal in the springtime, so just because this El Niño is especially strong doesn't mean that the chances of a wet spring are especially high.

While El Niño is still going strong, and ranks among the three strongest ever recorded, its demise is imminent. The official forecasts from NOAA's Climate Prediction Center call for conditions in the tropical Pacific Ocean to transition to neutral sometime in the summer. That means that sea surface temperatures in the central and eastern tropical Pacific will be within a degree Fahrenheit of their normal values, compared to the present 3 - 4 degrees Fahrenheit above normal.

El Niño and La Niña are caused by a *sloshing* of the warm water at the surface of the tropical ocean from west to east, and back again. That *sloshing* plays out over a few years, and can be interrupted or otherwise affected by weather in the tropical atmosphere. This El Niño has been strong for so long that we are due for a *slosh back*. Historically, about half of all El Niños end with a bang, not a whimper, meaning that the tropical conditions overshoot the near-normal values and drift into La Niña cooler-than-normal territory.

The potential development of La Niña doesn't mean much for the high plains this summer. The summer season is notoriously difficult to forecast anyway, and the effect of El Niño and La Niña on the United States is weakest in summer. But if a full-blown La Niña develops in the fall, the odds shift toward a drier than normal winter in the Texas high plains.

Meanwhile, we continue to watch whether the period of frequent droughts in the southern plains since 1996 is coming to an end. Both the Atlantic and Pacific Ocean are now in patterns that are favorable for long-term rainfall. It remains to be seen whether these patterns hold, but it's worth crossing one's fingers. In any case, the chances of drought are still slightly elevated next year because of the likelihood of La Niña. After that, there is hope that the longer-term drought cycle will be over. I, for one, will believe it when I see it!

RESOURCES

Climate Prediction Center seasonal forecasts:
http://www.cpc.ncep.noaa.gov/products/predictions/long_range/

Climate Prediction Center El Niño monitoring:
http://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml

El Niño forecasts from around the world:
http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/

A good Youtube summary of how El Niño works, from the Brits:
https://www.youtube.com/watch?v=WPA-KpldDVc

On the lighter side:
http://www.independent.co.uk/news/mr-a-nino-weathers-a-storm-of-protest-1148017.html

World Dairy Outlook

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NOTES:

Avoiding and Surviving Undercover Video Investigations on the Farm

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Unfortunately, the use of undercover videos by animal rights activists is an issue the dairy industry knows all too well. This presentation will offer tips for dairy farmers to avoid finding themselves the subject of an undercover investigation by focusing on hiring practices, employee training & policies, and crisis response.

I. HIRING PRACTICES

a. Consult with attorney to ensure hiring practices are legal. (Most importantly, be consistent to avoid discrimination against protected class!)
b. Seek specific information in the job application.
c. Require a signature of application under the penalty of perjury.
d. Google the employee's name.
e. Look for a social media presence by the employee.
f. Contact each reference and confirm they are legitimate.
g. Complete a background check.
h. Beware of common warning signs:
    i. Seeking employment below employee's skill level;
    ii. Previous jobs are wholly out of character with position sought;
    iii. Providing a newly obtained or out - of - state license;
    iv. Usually young (18 - 30);
    v. Volunteering to work for no pay;
    vi. Seeking short-term work;
    vii. Asking questions about security procedures;
    viii. Seeking jobs because they have "always wanted to see something done";
    ix. Frequently seen in places job duties do not take them; and
    x. Lurking around animal areas before or after shift.

II. POLICIES AND TRAINING

a. Consult with attorney to review all handbooks and contracts. (Most importantly, be sure not to unintentionally modify at will relationship!)
b. Develop detailed animal care and handling policies.
    i. Common issues involve downed animals, euthanasia, medical procedures, and general animal handling.
c. Consider adopting policies banning recording/photography.
d. Require signature that employees received, read, and understands policies.

e. Provide necessary tools and equipment to carry out policies.
f. Offer ongoing, mandatory training.
g. Enlist trusted employees.
h. Require immediate reporting of animal abuse.
i. Conduct your own audit/undercover investigation.

III. CRISIS RESPONSE

a. Pre-crisis
    i. Have a crisis response team in place.
        1. Attorney
        2. Veterinarian
        3. Media firm/trained spokesperson
    ii. Develop a communications policy.
        1. Who speaks and who does not!
    iii. Engage in detailed recordkeeping.
    iv. Store up goodwill in the community and industry.
b. Post-crisis
    i. Notify and involve crisis team.
    ii. Immediately engage spokesperson.
    iii. Consider sending a spoliation letter.
    iv. Consider seeking an injunction against video being released/played.
    v. Open the barn doors.
    vi. Accept responsibility—do not blame others.

IV. ADDITIONAL RESOURCES

a. Dairy Management Inc.'s Crisis Training Schools.
b. Dairy Management Inc.'s Anticipate. Prepare. Protect. http://www.progressivedairy.com/topics/management/is-your-dairy-ready-for- an-animal-activist-attack
c. National FARM (Farmers Assuring Responsible Management) Program: http://www.nationaldairyfarm.com/animal-care-program
d. National Milk Producers Federation: See it? Stop It.: http://www.seeitstopit.org/
e. Audit companies like Validus www.validusservices.com and Paredium: http://praediumventures.com/
f. Forthcoming: Ohio Farm Bureau Livestock Farm Labor and Crisis Prevention Guide

Panel Discussion: When "It" happens – Business Continuity

Moderator, Dr. Ellen Jordan, Texas A&M AgriLife Extension
Panelist, Joe Osterkamp, Gerald Osterkamp Dairy
Panelist, Ty Koontz, Blue Bell
Panelist, Luke Larson, Platte Valley Cattle Company, LLC

NOTES:

Industry Presentation - Nutritional Management Strategies for Dairy Cattle during Thermal Stress

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Two primary strategies to maximize performance of cattle during warm summer months are to alter the environment around the animal and change nutritional management to maximize feed intake and substrate utilization. During periods of heat stress the nutrient requirements of animals are altered resulting in the need to reformulate rations. Rations fed to animals exposed to thermal stress need to be of higher nutrient density since feed intake will be suppressed. Clean water should be available to all animals at the milking parlor exit lane and in the housing area under shade. Additionally behavioral changes in animals relative to feeding behavior and seeking shade require good feeding management programs. Finally use of feed supplements to reduce impact of stress on animals and improve immune function is warranted.

Immune function is generally suppressed during periods of thermal stress. The feed additive Omnigen-AF has been shown to improve immune function and animal health when fed during periods of thermal stress. Addition of buffers to the ration should also be considered to combat development of acidosis due to higher density rations and the impact of thermal panting on animals. If animals are on a by-product ration which is low in K+, then addition of K+ to the ration should be considered because thermal stress has been shown to increase K+ requirements by as much as 12 %.

I. Nutrient Requirements

a. Feed high quality feeds
b. Increase nutrient density of ration
c. Maximize availability of water

II. Behavioral Changes

a. Change feeding times to increase availability of fresh feed at night
b. Provide feed under shade during daytime hours
c. Provide water under shade during daytime hours

III. Feed Supplements

a. Consider use of buffers to combat acidosis
b. Consider adding K+ to diet if cows are on byproduct rations due to increased K+ loss in sweat
c. Omnigen-AF has been shown to reduce blood cortisol and adrenal response to ACTH
    - Associated with improved immune function and reduced health issues
d. Yeast products are widely used to improve rumen function and digestive tract performance during hot summer months
e. Ionophores and betaine can also be considered to improve availability of glucose which is a primary substrate of peripheral tissues during thermal stress

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Industry Presentation - Impact and Economic Evaluation of Negative Energy Balance in Transition Dairy Cattle

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INTRODUCTION

The ability of dairy cattle to adapt to the natural change of energy balance in early lactation is an important aspect of the transition period, as the demands for milk production cannot be met by feed intake alone. In order to maintain homeorrhesis during this period of negative energy balance, cows break down adipose tissue to produce non-esterified fatty acids (**NEFA**), which are partially converted to ketone bodies (e.g. β-hydroxybutyrate; **BHB**) that can act as alternate fuel sources. Excessive production of these energy metabolites, particularly cows diagnosed with hyperketonemia (BHB ≥ 1.2 mmol/L), has been shown to have detrimental effects on immune function, milk production, and overall health. Given that 85 - 95 % of hyperketonemic cows do not show signs consistent with clinical ketosis, the health and production consequences of a poor transition into lactation are often unseen.

MANAGING THE TRANSITION PROCESS

Individual Animal Diagnosis and Treatment

Use cow-side blood BHB meters to diagnose hyperketonemia as they are more accurate than urine or milk tests. Cows with hyperketonemia have blood BHB concentrations ≥ 1.2 mmol/L.

- Drench hyperketonemic cows with 300 mL of propylene glycol **(PG)** once/d for 3 - 5 d.
- Give one dose of vitamin B12 at the start of propylene glycol treatment.
- For cows with more severe hyperketonemia (BHB ≥ 3.0 mmol/L), administer ½ - 1 bottle of dextrose intravenously.
- Use of glucocorticoids (e.g. dexamethasone) are equivocal and may be detrimental to cows with BHB > 2.0 mmol/L.

Costs Associated with a Case of Hyperketonemia

The cost of hyperketonemia includes not only treatment costs. Multiple studies have shown that the risk of metritis, displaced abomasum, and early lactation culling are increased for hyperketonemic animals. In addition, reproductive performance to first service suffers and there is a decrease in milk production in early lactation.

- The average total cost per case of hyperketonemia is $289.
- Cost per 1,000 calvings in a herd with a 30 % incidence of hyperketonemia is approximately $86,500.

Herd-level Monitoring and Treatment

To determine how much ketosis is in your herd, sample about 20 cows from 3 - 16 DIM to estimate your herd prevalence. This is a snapshot of your herd, and some cows may have already had ketosis and recovered or will go on to develop ketosis; thus the actual number of cows experiencing hyperketonemia during this period will be

approximately 2 times your prevalence. For example, if you test 20 cows and 5 are hyperketonemic, your prevalence is 25 %; however it is likely that 10 of these 20 cows will have BHB ≥ 1.2 mmol/L at least once from 3 - 16 DIM (i.e. 50 % incidence).

- If herd prevalence is ≤ 15 %, continue to monitor the herd-level prevalence monthly.
- If herd prevalence is > 15 to 40 %, sample cows 3 - 9 DIM twice weekly for improved treatment response.
- If herd prevalence is ≥ 40 %, consider blanket treatment with PG starting at 3 DIM.

Repeated prevalence testing is recommended in order to evaluate changes in transition cow management and allow appropriate adjustment of farm hyperketonemia testing and treatment protocols. For a herd with a 20 % prevalence of hyperketonemia that freshens 1,000 cows/yr, choosing to test cows 2 d/wk and treating the positives will return a benefit of $10,000 to $25,000/yr.

Prevention of Hyperketonemia

***Remember**, the goal is to not treat many, if any, cows with PG, but rather have transition cow management strategies in place such that the prevalence of hyperketonemia is lower than 10 %.* Decreasing the prevalence of hyperketonemia from 20 % to 10 % will save almost $60,000 across 1,000 calvings. Preventative management strategies include, but are not limited to:

- Feeding a controlled energy diet during the dry period,
- Feeding rumen protected choline and monensin throughout the transition period,
- Minimizing the stocking density of pens and pen moves before arrival in the maternity pen,
- Housing fresh heifers separate from cows,
- Maintaining a fresh pen stocking density < 85 %, and
- Maximizing cow comfort.

CONCLUSIONS

Excessive negative energy balance in early lactation is an issue in many dairy herds. As most cases of hyperketonemia are subclinical in nature, associated disease events, early removal from the herd, and production losses are often unrecognized economically. Individual and herd-level testing should focus on the first week to two weeks of lactation in order to optimize individual animal treatment and herd management practices. Although testing and treatment of hyperketonemia is economically beneficial, nutritional and management strategies to prevent hyperketonemia should be the goal.

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Industry Presentation - Tips for Optimizing Fertility in Dairy Cattle

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The 2015 Dairy Cattle Reproduction Council (**DCRC**) award winners' annual herd 21d pregnancy rate ranged from 26 – 39 % for lactating Holstein cattle. The question is "How do they achieve those pregnancy rates?"

The majority of cows in the High Plains are inseminated based off of estrous detection, which stresses the importance of having accurate estrous detection and excellent conception rates to those heats for optimal fertility. Strategies outside of hormonal manipulation, which are not discussed in this lecture but are covered by other speakers, include the importance of good management and genetics to improve postpartum health, cow comfort, body condition, etc.; which in turn allows for optimal fertility.

The response and timing to the sequential injections of hormones (i.e. gonadotropin releasing hormone (**GnRH**) and prostaglandins (**PG**)) used in the Ovsynch protocol can dramatically affect fertility.

Many commonly used synchronization programs, and the timing of the injections within the synchronization programs, were developed from research that did not utilize estrous detection. However, most herds in the High Plains use estrous detection as part of their reproduction program. Over the past several years some of the synchronization programs have been re-evaluated with estrous detection included.

Preynchronization (**Presynch**) programs based on GnRH can reduce estrous detection and PG based Presynch programs can improve estrous detection; so it is important to choose a synchronization program that maximizes estrous detection, if that is a goal of your farm. Of course that's provided you can achieve good estrous detection and conception rates.

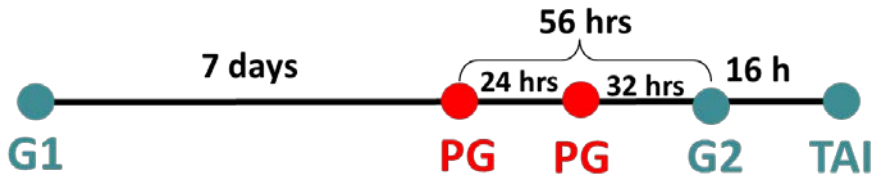
The interval between Presynch (2 injections of PG 14 d apart) and the first GnRH (G1) of the Ovsynch program can vary between 10 – 14 d, if utilizing good estrous detection.

Conception rates following first AI continue to be less than optimal. Using a robust resynchronization program coupled with good estrous detection can improve fertility.

Conception rates to resynchronization programs have improved 5 – 7 % with the addition of a PG injection 7 - 11 d or a GnRH injection 6 - 7 d prior to beginning Ovsynch.

Recently, studies have shown the addition of a second PG within the Ovsynch protocol can improve your herd's conception rate 3 – 6 % (Figure 1). The main benefit of the 2 PG injections is on cows that begin the Ovsynch program without a corpus luteum (**CL**). A CL is induced with the first GnRH (**G1**), which is approximately 20 – 30 % of the cows that enter the Ovsynch program. The newly formed CL will only be 6 d old at the first PG injection of the Ovsynch protocol.

Figure 1: Schematic of two PG injections in Ovsynch. (G = Gonadotropin Releasing Hormone; PG = Prostaglandin; TAI = Timed Artificial Insemination)



A 6 d old immature CL is less responsive to a PG injection, so 2 injections are necessary for complete CL regression to achieve low progesterone levels at AI and optimal fertility.

The addition of a second PG during an Ovsynch program may be more beneficial on dairies that have good estrous detection, as the *problem* cows end up in the Ovsynch program, which becomes a concentrated population of cows that are anovular (no CL). These cows will have a better response to G1 and in turn need 2 PG injections for CL regression.

Recent research has shown that fertility to sexed semen can be improved if the timing of insemination is closer to ovulation. The ideal timing for conventional semen is 4 to 12 hr from onset of estrus to insemination. However, a recent study has shown that when using sexed semen in lactating cows the ideal timing for best fertility was 13 to 41 hr after onset of estrus as indicated by activity monitors.

RESOURCES

Visit www.dcrcouncil.org for information regarding recommended synchronization programs published by the DCRC. There are both dairy cow and dairy heifer protocols. In addition, the protocols are available in Spanish as well as English. Other resources are also available on this site for members. Their annual meeting is in Columbus, Ohio on November 10th and 11th and provides the latest information on strategies to improve dairy cattle fertility.

Industry Presentation - Consequences and Costs Associated with Mastitis and Metritis

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INTRODUCTION

During the first 30 d of lactation, cows are at high risk for both infectious and metabolic disease issues such as hypocalcemia, ketosis, retained placenta (**RP**), metritis, and abomasa displacement (**DA**). These and other diseases that occur during the early postparturient period are detrimental because they decrease milk production, increase treatment costs, negatively impact reproductive performance, and increase mortality and culling risk. The two most costly of these issues that also result in a high level of antimicrobial use on dairies are mastitis and metritis.

Mastitis is a disease condition characterized by inflammation of the mammary gland and is considered one of the most costly diseases affecting dairy cattle worldwide. Clinical mastitis, more specifically mastitis occurring in the first 30 days in milk (**DIM**), results in a number of negative outcomes including pain and inflammation, reduced milk production (5 - 8 % total lactation loss), decreased reproductive performance (4 - 8 d delay to first service, 23 % reduction in first AI conception rate (**CR**), 15 % reduction in percent pregnant by 320 DIM, and 21-25 more days open), approximately double the risk of premature culling, and a small increase in risk of death (Lucey and Rowlands, 1984; Milian-Suazo et al., 1988; Gröhn et al., 1998; Hortet and Seegers, 1998; Seegers et al., 2003; Santos et al., 2004; Wilson et al., 2004; Bar et al., 2008; Schukken et al., 2009; and Fuenzalida et al., 2015). Due to a combination of a high incidence and the antimicrobial components of commonly used treatment protocols, this disease likely accounts for more cows receiving antimicrobial exposure than any other disease condition. Based upon recent data collected by Santos et al., regional incidence for mastitis in early lactation varies by geographical region and season of calving with ranges from 5.5 to 26.1 % based on on-farm records (Santos et al., 2015).

Metritis is also a very common and complex disease condition in postparturient dairy cattle that is characterized by inflammation of the uterine tissues, and based upon previously mentioned farm-level studies, region average whole herd incidence varies from 18.5 to 27.6 % (Santos et al., 2015). In general, first lactation cows appear to be having a higher incidence, but mature cows tend to have a higher percent of cases that are severe in nature.

Severity can range from very mild to severe, life threatening forms. It is most often diagnosed during the first 14 DIM; but it can negatively affect milk production, reproduction, and culling risk well beyond early lactation. Numerous studies have demonstrated both direct and indirect negative impacts of uterine disease on overall dairy herd performance and profitability (Borsberry and Dobson, 1989; Lee et al., 1989; Rajala and Gröhn, 1998; Fourichon et al., 1999; LeBlanc et al., 2002; and Gilbert et al., 2005). California researchers found that cows with metritis averaged 4.9 lb/d less milk over the first

120 d of lactation compared to normal herdmates (Deluyker et al., 1991). Other work has shown that the level of milk loss varied by DIM:

- Cows with metritis that were culled during the first 30 DIM produced 15.1 lb less milk/d and had a median days-to-exit of 10;
- Cows with metritis that were culled during 31 - 60 DIM produced an average of 9.1 lb less milk/d and had a median days-to-exit of 42; and
- Cows with metritis that survived past 60 DIM experienced an average of 6.2 lb of milk lost/d over the first 110 DIM and then no difference from herdmates (Overton and Fetrow, 2008).

Metritis has been shown to have varying influence on culling with some studies showing no effect while others show that cows that experience metritis are approximately twice as likely to be culled (Gröhn et al., 1998; Rajala-Schultz and Gröhn, 1999; and Wittrock et al., 2011).

Metritis also has significant negative impacts on reproduction. It has been associated with 7 more days to first service, a 20 % lower first service CR, 13 - 19 more days open, and a significant reduction in pregnancy rate (Lee et al., 1989; Fourichon et al., 2000; and Overton and Fetrow, 2008).

The goal of this project was to evaluate commercial herd data from the High Plains region (TX, NM, AZ, CO, and OK) to evaluate the measureable impact of on-farm recorded mastitis and metritis on milk production, reproduction, and culling. Herds that were enrolled in Elanco's Dairy Data Access System that recorded milk production, had at least 2 % recorded mastitis incidence in the first 30 DIM, and at least 5 % recorded metritis incidence were eligible for inclusion. Records were extracted from the DairyComp305 program and included cows that calved anytime during 2014 and were followed for ~300 d or until culled. A total of 32,278 cows from 10 herds were part of the final data set. The analyses were restricted to breed codes for Holstein (68 % of all cows) or Jerseys and crosses (32 %) which were collapsed into a single category.

Descriptive statistics were performed to demonstrate that the herds were representative of commercial herds and included frequency histograms for parity (L = 1, 35 %; L = 2, 30 %; and L > 2, 35 %), calving dates, season of calving, age at first calving (mean of 22.6 mo), and previous days dry (mean of 61.8 d). Herd averages for 120d cumulative milk (9,873 lb) and 305me milk (26,211 lb) were also calculated. Metritis incidence ranged from 7.6 - 16.9 % with a mean of 10 %. Mastitis within the first 30 DIM ranged from 2 – 12.4 % with a mean of 7 %.

First, multivariate nominal logistic fit models were created to evaluate risk factors for metritis and mastitis. In each case, separate models were created for primiparous vs. multiparous cows. The primiparous model for metritis (log odds of yes/no) offered the following potential explanatory variables for consideration: herd, breed code (Ho or Je/X), season fresh, calf outcome (M, F, or Twin), age at fresh category (< 21 mo, 14 %; 21-24 mo, 72 %; and > 24 mo, 14 %), RP (yes/no), and calving ease score (1 - 5). Due to inconsistencies in recording across herds, RP and calving ease were dropped. Breed code was not significantly associated with risk of metritis. Having a male calf or twin resulted in higher odds of metritis with twin calvers much higher than those delivering males. Heifers calving later in age had

reduced odds of metritis. Heifers calving in the spring had higher odds of metritis than those calving in fall or winter.

A similar model was created for multiparous cows except previous days open was used instead of age at calving and lactation group (lact = 2 or > 2) was added. Breed code was not a significant predictor, but herd was. Mature cows were at higher odds of metritis than second lactation cows. Having longer previous days open was associated with higher odds of metritis. Again, delivering male or twin calves resulted in higher odds of metritis with twins associated with much higher odds than either male or female calves. Summer calvers had a higher odds for metritis relative to spring or winter calving cows.

Likewise, the primiparous model for mastitis (log odds of yes/no) offered the following potential explanatory variables for consideration: herd, breed code, season fresh, calf outcome, and age at fresh category. Again, herd was significant, but breed code was not. Heifers calving in the summer, fall, and winter were at higher odds for mastitis relative to spring. Heifers calving at an older age were associated with higher odds of mastitis relative to those calving younger or at average age.

For the multiparous mastitis model, herd, breed code, lactation group, and previous days open were all significantly associated with risk of early lactation mastitis, but season fresh and previous lactation 305me was not. Longer days open, Holstein, and older cows were all associated with higher odds of mastitis. Dry log somatic cell count (**SCC**) was significantly associated with odds of early mastitis, but less than half the herd had this variable recorded. Thus, it was dropped from further analyses.

To evaluate the relationship of mastitis and metritis on milk production, a multivariate model to fit least squares means was created using two separate outcomes for production, Milk120 and 305me, for each of the two parity groups, primiparous and multiparous. Milk120 is the estimated cumulative milk through 120 DIM as estimated by DairyComp305. Covariates offered to the primiparous model included herd, breed code, season fresh, age fresh category, calf outcome, mastitis (yes/no), and metritis (yes/no). Breed code was not significant but the remaining covariates were. Adjusting for the impact of these variables, having mastitis in the first 30 DIM was associated with 268 lb less Milk120 and a reduction in 305me of 1,263 lb. Metritis was associated with 184 lb less Milk120 and a reduction in 305me of 575 lb.

For the multiparous cows, a similar set of models was created except that previous lactation 305me and lactation group was added and age fresh category was removed. Only breed code was not significant. Adjusting for the effect of the remaining significant variables, a case of mastitis was estimated to result in a loss of 409 lb of Milk120 and 1,158 lb less 305me while metritis resulted in 337 lb less Milk120 and 633 lb less 305me milk.

To examine the impact of mastitis and metritis on culling and reproduction, separate Cox Proportional Hazards models were created to examine time to event through 300 DIM. Again, separate models were created for the 2 parity groups. For both parity-based models, herd, breed code, season fresh, 305me milk, metritis (yes/no), and mastitis (yes/no) were included. In addition, age at calving category and lactation group were added to the

primiparous and multiparous models, respectively.

In the primiparous culling model, only herd, 305me, and mastitis were significantly associated with risk of culling. As expected, a higher 305me was protective against culling while having mastitis resulted in 1.3X higher risk of removal by 300 DIM.

In the multiparous model, all variables were significant and remained in the model. As in the primiparous model, a higher 305me was associated with reduced risk of culling. Adjusting for these multiple covariates, mastitis and metritis in the first 30 DIM were associated with 1.26X and 1.25X higher risk of culling by 300 DIM, respectively.

In the primiparous reproductive model, breed category, 305me, and mastitis were not significant predictors of reproductive outcome. Mastitis was associated with a 37 % reduction in likelihood of pregnancy by 300 DIM. In the multiparous model, only 305me was not significantly associated with risk of pregnancy. Mastitis and metritis resulted in an 11 % and 35 % reduction in likelihood of pregnancy by 300 DIM, respectively.

The negative effect of mastitis and metritis on milk production, culling, and reproduction was expected; but the magnitude of the impact was less than expected. Relative to a larger analysis that included more than double the cows and herds as this one that was conducted by the author, the milk production loss associated with mastitis was almost 50 % less and the metritis effect was also significantly less. The culling risk and reproductive risk were very similar; but in both this analysis and the larger national analysis, the negative impacts of mastitis and metritis were less than expected as compared to published research. There are a number of potential reasons for the differences including:

- Differences in pathogens causing disease,
- Differing levels of severity,
- Different approaches to therapy,
- Different approaches to culling decisions during this historical time of high beef prices and relatively economical replacement heifers, and finally,
- Failure by farms to completely or accurately characterize the level and/or type of disease.

Epidemiologically speaking, failing to properly record disease leads to a recording/reporting bias which leads to an underestimation of the influence of the recorded disease on the herd's health and production. By failing to identify all affected animals, the statistical comparisons are now being made between a subset of affected animals and the remaining population that contains both non-affected and affected cows. This misclassification results in an underestimation of the actual clinical impact and falsely suggests that the diseases are having less of a negative impact than is actually occurring.

CONCLUSIONS

Mastitis and metritis were demonstrated to negatively affect milk production, culling, and reproductive performance in commercial dairy cows in the High Plains region. The apparent impact is less than expected and may be due to a variety of issues including inconsistent disease definition or detection/recording intensity across herds. Improved disease recording and the inclusion of other variables not examined in this data set including RP, DA,

calving ease scores, and dry log SCC are likely to change the measured impact of these 2 diseases.

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Panel Discussion: Managing Dry Lot Dairies during Extreme Weather Events

Moderator, Dr. Joe Harner, Kansas State University
Panelist, Cody Kirby, Manager, Caprock Dairy Muleshoe
Panelist, Rusty Pinkerton, Manager, Dalhart Jersey Ranch
Panelist, Albin Smith, Owner, Manager, SAS Dairy & Arrowhead Dairy

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