Take Home Messages Heard at This Year’s Dairy Partner/Young Dairy Producer Meeting

By: Donna M. Amaral-Phillips

The Kentucky Dairy Partners and Young Dairy Producer meetings held in Bowling Green are always a great exchange of ideas and updates regarding the Dairy Industry, not only as they relate to Kentucky but throughout the US and globally. This year’s program again delivered in these areas. For those of you who were unable to attend, a brief summary of some of the speakers’ main discussion points are summarized in this article.

Animal Care - What You Need To Know

Dr. Charles Townsend began his discussion reemphasizing how public perceptions impact animal agriculture, including the dairy industry. The public wants assurances that their food is produced in a manner consistent with their values. To address this, the dairy industry proactively implemented the validation of animal care practices, commonly through application of the FARM program and its validation mechanisms.

Dr. Townsend also discussed that dairy producers need to continue to be proactive when it comes to animal care, employee management, environmental stewardship and judicious use of antibiotics. This begins, but does not end, with obtaining signed employee agreements that employees will report animal abuses to owners. He also suggested that farmers use video surveillance systems. In addition, farmers need to identify risks on their dairies including knowing withholding/withdrawal times for antibiotics, perform their own audits to assess areas needing improvement, and continue to develop relationships and communication channels with their neighbors.

Managing Your Components - Butterfat

Dr. Darren McGee from Elanco discussed some of the risk factors associated with depressed milk fat. A majority of these risk factors are associated with changes in the rumen environment of the cow. These changes can result in a decrease in the production of milk fat by cells within the udder.

He noted that most of the risk factors are known, but they are difficult to identify and then correct on-farm. These risk factors can be attributed to 3 categories: herd demographics, diet-related factors and management. He covered some key control points for each of these 3 categories. As it relates to herd demographics, cows have a lower butterfat percent in the summer and from 60 to 90 days in milk. Several dietary factors impact milkfat, but the top on the list is cows sorting their feed resulting in an inconsistent and lower dietary fiber intake. In addition, depressions in milkfat might be seen when shifting between forage sources, for example when opening a new silo that may be wetter than the previous silo storage structure and adjustments in amounts fed were not made accordingly.

Dr. McGee spent most of his time discussing management factors that influence milk fat. As it relates to feeding a TMR, sortability of the TMR not only at time of feeding but also later in the day, uniformity of TMR mix, load order for TMR mixes, and accuracy of feeding scales can impact milkfat content. In addition, stocking density, time away from the “home” pen, and as importantly, heat abatement practices influence milkfat. He reminded the audience that it is not one particular practice that reduces milkfat synthesis, but a combination of risk factors.
Economics of Different Milking/Production Systems

Dr. Larry Tranel from Iowa State Extension Service talked both days of the conference on the economics of different production (conventional, organic, or only grass-fed organic systems) or milking systems (low-cost parlors vs robots). Irrespective of the system a farmer chooses, Dr. Tranel encouraged the audience to practice optimistic thinking where you think through how spending money can make you additional profit. Keeping a positive focus is very important at all times in any business.

Dr. Tranel discussed the difference between cash flow and profitability. Business operators should always calculate profitability not just cash flow. Profitability entails covering costs while accumulating wealth. When calculating profitability, his preference is to calculate a return per hour for unpaid labor. As you would expect, profitability of any system is influenced by milk price. For example, a change of conventional milk price by $1/cwt would have resulted in unpaid labor cost per hour similar between organic and conventional herds in the herds he studied in 2016.

On the second day, Dr. Tranel discussed robotic milking systems and low cost parlors. An interesting number was that milking accounts for 40 to 50% of total labor costs. As expected, robots lowered labor costs by about 75%. With robots, feed costs were expected to be higher as a result of improved milk production and higher supplement costs associated with pelleting the grain fed through the robot. In addition, teat dip costs were higher in robots. Dr. Tranel indicated that farmers with robots should watch how a robot dips teats to ensure good coverage to help prevent increases in SCC.

Throughout Dr. Tranel’s presentations on both days, he emphasized that all systems can work. The key is to manage any system you choose as a business and evaluate them as such. Using financial information allows one to identify successes and issues early.

Reproductive Management

On both days, Dr. Jeff Stevenson, professor at Kansas State University, spoke about the recent discoveries and tried and true methods which improve the success of getting cows bred back in a timely manner. He made the statement we all know too well, “if cows do not get pregnant, it is hard to maintain revenue”. Generally, the optimum window for getting cows pregnant is between 80 and 150 days in milk. First-calf heifers may benefit from a longer calving interval than mature cows. Using either activity monitors or timed AI programs can result in equal success of getting cows pregnant. With either method, one should expect approximately 2/3rd of cows to become pregnant. Approximately 20% of cows do not show estrus at the usual timing of the first service, thus the use of an Ovsynch or Presynch/Ovsynch protocol may be necessary. Dr. Stevenson reminded the audience that all injections should be given IM using an 18 gauge, 1 ½-inch needle to deliver the solution deeply into the muscle.

The key in getting cows pregnant is the early identification of open cows. Open cows are back in heat 19 to 25 days after previous heat or breeding and need to be rebred. To identify those open cows, timely and frequent pregnancy checks are needed. Transrectal palpation to identify pregnant/open cows can be done as early as 35 to 40 days after AI whereas transrectal ultrasound can be used as early as 28 to 32 days after AI. With either method, Dr. Stevenson ideally recommends that pregnancy checks be done weekly. Blood or milk tests can also be used to diagnosis pregnancy, ideally 30 to 40 days after breeding. Dr. Stevenson recommended that pregnancies be reconfirmed at least 4 to 6 weeks after the initial early pregnancy diagnosis and again at 200 days of pregnancy or before dry off.

With early pregnancy diagnosis, higher embryo losses are expected since you are actually measuring the losses during early pregnancy. Reproductive physiologists expect to see 10 % fetuses lost between early palpations/ultrasound diagnosis and the follow up pregnancy diagnosis at 60 to 80 day post AI. Embryo losses are not related to a cow’s milk production or the use of timed AI versus use of estrus detection to determine when to breed cows. Cows with mastitis during the first 45 days of pregnancy are 2.7 times more likely to abort during the next 90 days. Embryo losses are also higher in cows that lose one body condition score or more between calving and AI, reemphasizing the importance of management during the transition from the dry period to lactation.
Techniques of On-Farm Milk Culturing

By: Thomas Sumner and Donna Amaral-Phillips

With the increasing concern about the prudent use of antibiotics, a more evaluative approach is needed to target the use and estimated success when using antibiotics to treat cows with mastitis. Production losses due to subclinical mastitis were recently estimated to cost the dairy industry $1 billion dollars annually. Knowing which cows have treatable mastitis and identifying which do not within 24 hours can help the farmer make a better treatment decision with more judicious use of antibiotic therapy and reduce the cost of discarded milk. One simple and effective way to cut cost, while also cutting antibiotic usage is to use on-farm culturing of milk from cows with clinical mastitis signs or elevated somatic cell count (SCC). On-farm culturing can reduce antibiotic usage by 50%. Getting started utilizing on-farm culturing can be simple and quick. Here are some tips.

- **Location for your laboratory:** Correctly locating the on-farm laboratory is critical. Find a place that is dry, well lit, clean, and away from human food preparation. Setting up in the cleanest spot possible increases your chances on getting good results and not letting the samples get contaminated. Some simple appliances are needed for on-farm culture, a simple incubator to grow the cultures, and a refrigerator to keep the plates and collected milk samples cold.

- **Learn how to interpret results on plates:** A simple mistake made by farmers is not understanding the results from the cultured plates.

  - **Biplates** (plates containing 2 different growth media) are the simplest plates used for on-farm culturing. The red media is usually where gram-positive bacteria grow, and the other media is a pink color and grows gram negative bacteria. Some simple rules are: (1) if growth occurs on the gram positive side you should consider treating the cow especially if she is clinical, (2) if growth occurs in the gram negative side you should not treat because the mastitis cannot be cured with antibiotics, and (3) no treatment when no growth occurs. Realize that 30 to 50% of cultured samples for mastitis will result in no growth being detected since the cow’s immune system may have cleared the infection or the bacteria is currently not being shed into the milk.

  - **Triplates** include both medias from the biplate as well as a darker red media which is selective for streptococci mastitis. This plate allows the separation of Staph. and Strept. species. To differentiate between *Staph aureus* and other Staph species, i.e CNS, additional analysis is needed.

  - **Quadplates** include all the medias from the triplate, as well as a blood agar section. If no growth occurs in the gram positive and negative as well as the streptococci section but occurs in the blood agar section, a sample should be sent to a lab for further examination.

- **Sterile milk samples needed:** Getting a sterile, fresh sample is critical for culturing the bacteria causing mastitis. This process should include: (1) the sampler should always be wearing gloves, (2) the normal process for preprocessing a teat should be done beforehand including cleaning the teat, using the pre-dip, dried and fore-striped, (3) after the teat prep is done, an alcohol pad should be used on the teat end to clean the teat end and make it aseptic. This insures all the bacteria is removed before the milk sample is taken, and (4) using an unopened, sterile milk tube, collect your milk sample, and then label the tube and refrigerate until it’s time to plate the milk.

- **Plating milk samples:** Plating the milk sample is just as important as any other step in this process. Since the media grows any bacteria, getting just a tiny contaminating particle in the sample or plate could mess up the entire process and result in no usable results.

  - Make sure the station where you will be plating the milk is clean.
  - Use sterile gloves and sterile swabs when applying the milk to the media.
  - When plating the sample, go in a zig zag pattern to insure the bacteria is spread out evenly throughout the plate. Remember to streak the media on plates in the correct order for the best results.
  - Once the milk has been plated, place the left-over milk in the freezer in case you need to send it to a lab for further analysis.

- **Place plated samples in incubator media side up:** Following this practice increases your chances of success in growing the bacteria causing clinical mastitis.

  - After the milk has been streaked onto the plates, place the plates in the incubator upside down, the media should be on top. This prevents condensation from forming and dropping on the media.
  - Set the incubator to body temperature, which is 98.6° F or 37° C.
  - Leave the sample in the incubator for a minimum 24 hours which gives the bacteria plenty of time to grow.

- **Reading plates:** Reading the plate and determining what the growth means.

  - If colonies are in big clusters or following the streak, it is a good sample.
  - If colonies show growth in all the sections, it is a good chance that the plate is contaminated. Never use a contaminated plate to make a diagnosis.

A farmer who is using these tips can more accurately diagnosis the type of mastitis and treat it properly.
Heifer Synchronization and History
George Heersche, Jr.

I belong to an internet service called ResearchGate. ResearchGate keeps track of the research articles one has published and who is reading them. As an old school Extension person my list of peer reviewed scientific publications is not massive, but I have been involved in several interesting research projects. Results of one of the first popped up recently. It was from the 1974 Kansas State University Cattlemen’s Day Report and was about a synchronization project I did with beef heifers using a progesterone releasing device and prostaglandin F2 alpha. The progesterone releasing device was an ear implant (borrowed from the Synchro-Mate B protocol) and the prostaglandin was experimental and was marketed as Lutalyse six years or so after this research was done. We put the progesterone releasing device in the ear of 50 heifers and left it for seven days, then removed the implant and injected prostaglandin, and then watched for heat and inseminated the heifers exhibiting estrus. The results … IT WORKS! This was the first published research showing this is an effective heifer synchronization protocol and has proven to be one of the most consistently successful heifer synchronization methods … dairy or beef … year after year … herd to herd.

This is also on my mind because I have been working with a dairy herd that can’t make a more complicated heifer timed insemination protocol work for some reason. My recommendation is to go back to basics and try this method.

The modern version of this method utilizes a CIDR and Prostaglandin F2 alpha. The term CIDR is short for Controlled Internal Drug Release. The CIDR releases progesterone into the vagina at a controlled rate. Progesterone is “the pregnancy hormone” and keeps the heifer from coming into heat. The commercial name for the CIDR is Eazi-Breed CIDR Cattle Insert and it is sold by Zoetis. Prostaglandin F2 alpha is the hormone that causes the corpus luteum to stop producing progesterone and regress. The Eazi-Breed CIDR is inserted into the vagina for seven days and an injection of prostaglandin F2 alpha is given on the day the CIDR is removed or the day before the CIDR is removed.

The protocol looks like this:

- Day 0: Insert Eazi-Breed CIDR
- Day 6 or 7: Inject prostaglandin F2 alpha
- Day 7: Remove CIDR
- Days 8-12: Watch for heat and inseminate the heifers detected in heat

If the heifer is in the stage of her estrous cycle where she would have been in heat during the seven day protocol, the progesterone absorbed by the vaginal epithelial cells will keep her out of heat until the CIDR is removed and she metabolizes the progesterone. These heifers show standing heat 24-36 hours after the CIDR is removed. If the heifer is in the stage of her cycle where she has a functioning corpus luteum during the protocol, the corpus luteum dies after the prostaglandin injection and the heifer comes into heat after she metabolizes the progesterone from her corpus luteum and the CIDR. These heifers will come into heat 36 to 48 hours or later after the CIDR is removed. The expression of estrus and conception rates are normal. This protocol synchronizes estrus but does not synchronize ovulation tight enough for timed insemination, so heat detection is required.

Upcoming Events
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State 4-H Dairy Cow Camp
April 21, 2018
Shelby County Fairgrounds
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Grazing School
April 24-25, 2018
Princeton, KY
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