

Texas Dairy Matters

Newsletter



What is Texas AgriLife Extension Service?

Extension is a non-formal educational program implemented in the U.S. that is designed to help people use research-based knowledge to improve their lives. In most states, the educational offerings are in the areas of agriculture and food, home and family, the environment, community economic development, and youth and 4-H.

Texas AgriLife Extension Service is the proper name of Extension in Texas. Headquartered at Texas A&M University in College Station, AgriLife Extension develops much of its own curriculum. This curriculum is then taught across the state through its network of more than 600 county agents located in 250 of the 254 counties and its nearly 350 specialists. The primary mission of AgriLife Extension is to provide educational outreach programs and services to the citizens of Texas. In conjunction with Texas AgriLife Research, AgriLife Extension faculty members conduct research and bring practical applications of those research findings to the people of Texas.

Together, agents and specialists, aided by more than 150,000 volunteers, educate the public through classes, publications, Web sites, television series, and other outlets in the areas of agriculture, family and consumer sciences, human nutrition and health, environmental and natural resources, community development, and 4-H and youth development. Through its various programs, AgriLife Extension reaches more than 15 million Texans annually. The 4-H youth program, one of AgriLife Extension's premiere programs, is the largest in the nation, making up one-sixth of the national enrollment numbers.

The Texas AgriLife Extension Service – Dairy Team is a group of individuals dedicated to assisting dairy producers across the state. Members of this team are strategically placed in areas of high dairy concentrations to better serve producers and provide technical support for AgriLife Extension county agents. The Dairy Team provides dairy programming not only for their individual areas; but also statewide, as well as conducting research applicable to dairy operations.

Go to <http://texasdairymatters.org> to subscribe to the quarterly newsletter

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Ralph Bruno, DVM, MPVM

Ellen Jordan, PhD

Kevin Lager, MS

Working Together to Preserve Our Water

Texas AgriLife Extension Service – Dairy Team is organizing a water conservation meeting in Hereford.

This educational event is scheduled for 6 p.m. Oct. 8 at the Hereford Country Club. Nich Kenny, AgriLife Extension program specialist from Amarillo, will discuss “Working Together to Preserve Our Water.” The Dairy Team will also be presenting AgriLife Extension’s response to the dairy industry survey, as well as presenting future program ideas for water conservation and labor training.

Do not miss this opportunity to meet the AgriLife Extension – Dairy Team and discuss issues challenging the Panhandle dairy industry. Meal and refreshments will be provided by Sweet Bran.

Please RSVP by phone (806) 677-5600 (ask for Jerri Hamar) or by e-mail: texasdairymatters@ag.tamu.edu. Visit <http://texasdairymatters.org> for more information or call the AgriLife Extension office in your county: Bailey (806) 272-4583, Castro (806) 647-4115, Dallam/Hartley (806) 244-4434, Deaf Smith (806) 364-3573, Hale (806) 291-5267, Lamb (806) 385-4222, Moore (806) 935-2593 and Parmer (806) 481-3619.



The World Jersey Breeder combine tour visited the Dalhart area June 20-22. Thirteen countries were represented with the largest group from Australia



Dr. Mario Villarino, former Texas AgriLife Extension Service associate in Dallas, accepted a position as AgriLife Extension county agent for Hopkins County. The Dairy Team looks forward to working with Dr. Villarino in his new position.

The TVMDL has hired Dr. Daniela R. Bruno as the Microbiologist Dairy Specialist for the Amarillo unit. Dr. Bruno has a DVM from Brazil and received her PhD from UC Davis. The Dairy Team wishes the best to Dr. Bruno and looks forward to working together.

The Panhandle area has been attracting dairy operations to the state of TX

The dairy industry in the Panhandle area has been developing exponentially. According to the Milk Market Administrator, in 2001 the Panhandle area was home to approximately 15,000 cows and in 2008 it housed more than 200,000 cows on approximately 72 dairies.

Texas has close to 450,000 dairy cows with about 45% of the dairy cows in the Panhandle area. The number of cows are expected to rise over the next few years.

Dry Cow Mastitis and Immunotherapy: The use of natural body defenses

Daniela Resende Bruno, DVM, PhD

Texas Veterinary Medicine Diagnostic Laboratory – Amarillo, TX



Mastitis in dairy cattle is very common during the dry period and early lactation. Intramammary infections (IMI) observed during the dry period can be due to a subclinical infection (presence of bacteria without signs of inflammation) carried into the dry period from the previous lactation (pre-existing infections), or those acquired at the period between drying off and calving (new infections). Mastitis during the dry period leads to a decrease in milk production, poor milk composition and high susceptibility to clinical mastitis in the subsequent lactation, all of which dramatically impact dairy economics and animal health.

During the transition from a lactating to a completely non lactating dry udder, the mammary gland undergoes a series of changes that influence the cow's resistance to bacterial infection. With the cessation of milk removal, accumulation of milk into the udder will increase the pressure in the gland, causing the streak canal to widen and teat orifice to dilate, allowing bacteria into the gland. Once inside the gland, the milk acts as a rich environment for bacteria to multiply.

The mammary gland responds to an infection by increasing the influx of immune cells (somatic cells) that help to fight the infection. These cells migrate into the gland and release cytokines, which are proteins that initiate and regulate inflammation, immunity, and play an important role in mammary gland defenses. The successful elimination of the infectious agent or establishment of

an infection will depend on the degree of the inflammatory response, which is extremely variable among cows.

A common practice to control and prevent intramammary infections during the dry period is the infusion of antibiotics into the udder at drying-off (dry cow therapy - DCT). The withdrawal time is different among the diverse DCT antibiotics, varying from hours to days after treatment.

However, there are increased concerns of public health and food safety about the use of antimicrobial drugs in food animals regarding antimicrobial drug residues in milk and dairy products, leading to antimicrobial resistance and selection of drug-resistant food borne pathogens. A report from New Zealand shows that intramammary antibiotics make up more than 90% of all antimicrobials used in cattle in 2003 and have been used almost exclusively in dairy cattle. Public health concerns express a need to reduce the use of both preventive and curative antimicrobials in food animal production.

Alternatives to antimicrobial therapy to control mastitis, such as immunotherapy, have been an active area of investigation. Immunotherapy consists of the manipulation of the host's immune system, for example, production of specific cytokines could be stimulated in order to strengthen natural host defenses against infections. Enhancing a diminished mammary gland defense system may provide an effective barrier against new intramammary infections during increased susceptibility periods.

Several studies have shown promising results in using immunotherapy treatments. In a study from Ohio State University researchers found that addition of a specific cytokine, Interleukin 2, to a regular dry cow antibiotic targeting *Staphylococcus aureus*, enhanced the effectiveness of the treatment. However, abortion was observed in 7.5% of the cows that received this particular cytokine.

Further research is required to identify specific cytokines that can induce similar levels of benefit without side effects.

Researchers of USDA in Iowa stimulated the immune system of bovine mammary glands by infusing an extract of the yeast *Saccaromyces cerevisiae* during the dry period. The results showed an increase in the activity of immune cells, and suggested that this immune stimulation was similar to that of vaccination, making immune cells in the gland prepared to respond immediately in case of a new infection. This treatment could minimize the risk of a new IMI during the periparturient period.

The use of immune stimulating substances such as cytokines and *Saccaromyces cerevisiae* extracts are some examples of immunotherapy that could be a potential alternative to the current dry cow therapy. Research is still in development; but soon methods of immunotherapy may be available for the dairy industry and will be safe for animals and humans. Always remember to seek the advice of your veterinarian before using any new product at your dairy.



Minerals: Small Amounts, Major Impact

Kevin Lager, MS

Texas AgriLife Extension Service – Canyon, TX

Minerals comprise a small percentage of the diet, but can have huge consequences if supplements are removed or are supplied at inadequate levels in the ration. The major minerals, macrominerals, required by the cow include calcium, phosphorus, magnesium, potassium, sodium, chlorine and sulfur. Microminerals, minerals required in smaller quantities, include iodine, iron, cobalt, copper, manganese, zinc, and selenium.

Forages and concentrates provide a substantial portion of the mineral requirement, but supplemental mineral sources are required due to insufficient levels provided by the dietary ingredients and also due to the variability in bioavailability of the minerals from the forages and concentrates. It is necessary to test the dietary components for mineral content using approved methods of analysis. Wet chemistry analysis most accurately measures mineral content for a greater number of minerals, followed by inductively coupled plasma (ICP) and near infrared reflectance spectroscopy (NIR). Samples analyzed by ICP and NIR are checked against samples analyzed through wet chemistry methods.

So if there is an ideal time to eliminate or reduce mineral supplementation, what stage of lactation allows for this adjustment? In early to peak lactation the cow is depleting her bodily stores of calcium and phosphorus and is at her greatest need for adequate mineral levels due to the body's inability to store large quantities of available minerals. Selenium and zinc promote cow health during a time when her body is recovering from calving, maintaining a high level of production, and also preparing herself reproductively for pregnancy. Minerals, such as sulfur, copper and cobalt, promote gut health to assist with digestion of the large amount of feed being consumed that eventually ends up as milk. In mid to late lactation, the cow is still producing milk, but is also replenishing bodily mineral stores utilized in early to peak lactation to prepare herself for when she must draw on those stores when she freshens again. She also is supporting a growing fetus, which very well could be her replacement. The dry period also does not look good for inadequate mineral supply, since calf development is at its greatest during the later months of gestation. Sub-par nutrition in the dam significantly affects the health

of the calf she is carrying.

The effects of inadequate mineral levels may not be realized for months after the ration adjustment. These effects may surface as lameness issues, since a weak point in hoof development today may take up to three months before the hoof will grow out to where she will display lameness. Reproduction may suffer with inadequate mineral supply leading to greater days in milk before conceiving and increased costs associated with breeding due to increases in the number of services per conception and drug costs for synchronization.

Poor economic times are an incentive to improve efficiency. Test for the mineral content of the dietary components and formulate rations to supply adequate mineral levels based on cow production. Knowing the mineral content of the dietary components may allow for a reduction in the level of mineral supplementation depending upon the lab test results. Continue to work with a nutritionist to find the proper balance. Cutting corners now may very well cut into profits down the road.

This article is part of our monthly series (August 2009) and can also be viewed at <http://texasdairymatter.org>





Postpartum Uterine Diseases in Dairy Cows

Ralph G. S. Bruno, DMV, MPVM
Texas AgriLife Extension Service – Canyon, TX

As a result of genetic improvement from years of selection, dairy cows have become more efficient in producing milk. New challenges face producers trying to optimize animal performance. For example, the modern cow is more sensitive to small changes and less tolerant to some disease challenges.

Postpartum uterine diseases (metritis, clinical and subclinical endometritis) are some of the most important illnesses during the postpartum period. These diseases are very costly to treat and the consequences can carry over throughout lactation.

The clinical definition for metritis is watery, fetid, reddish/darkish uterine discharge, with or without fever (103.5°F). Clinical endometritis is characterized as purulent or mucopurulent discharge (> 50% pus). Also, subclinical endometritis is defined based on an increased number of inflammatory cells in the uterus.

In a recent study, California researchers reported that up to 68% of cows had a postpartum uterine disease within the first two weeks postpartum. Metritis accounted for 11 and 14% of the cases within 7 and 14 days of lactation, respectively. When subclinical endometritis was assessed at 35 days postpartum, 43% of the cows had subclinical endometritis. In this study, days open increased by 27 days and milk production decreased in cows with subclinical endometritis, when compared to cows without the

disease.

Postpartum uterine diseases are often caused by bacterial contamination of the uterus immediately after parturition. Antibiotic therapy is the main treatment, which is very costly due to treatment costs, milk discard, and liability from use of man-approved therapy. At the 2008 Dairy Cattle Reproduction Council Conference, the estimated cost of each case of metritis was calculated, based on treatment cost, milk withdrawal, labor, animal's death/culling, and milk production change after recovery from the symptoms. The total cost estimate for one case of metritis ranged between \$ 330 and \$386 depending on the therapy used and whether discarded milk was used for calves or dumped. Based on the prevalence of metritis (14%) reported previously, a dairy with 1,000 milking cows calving per year could incur an economic loss of over \$46,000/year just for the treatment of metritis.

Intrauterine infusion with antibiotics is still controversial among veterinarians and in the literature. In the US no product is labeled for intrauterine infusion. Using drugs off-label is an issue, not only because it is illegal, but also because withholding periods have not been established. Antibiotics may be found in milk, which leads to an even bigger issue for the dairy.

Since postpartum uterine diseases are very costly, the best clinical approach to postpartum uterine diseases is prevention.

In a study from the University of Wisconsin, cows with severe metritis reduced dry matter intake starting 10 weeks before calving. These, and similar results from other studies, indicate that anything decreasing feed intake in late gestation may be a risk factor for postpartum uterine diseases.

Minimizing drastic ration changes, not overcrowding cows during the dry-off and close-up period, and creating a good environment for late gestation cows helps prevent decreased feed intake during the prepartum period. Finally, providing a clean maternity area and using clean procedures, whenever an animal needs assistance during calving, are practices that aid in the prevention of uterine contamination during or immediately after parturition.



Multi-County Forage Field Day

East Texas producers met Aug. 25 near Golden for the 2009 Multi-County Forage Field Day sponsored by Texas AgriLife Extension Service. During the morning, tour participants viewed a herbicide comparison study for controlling Carolina horse nettle in forage systems. Soil fertility test plots comparing conventional, liquid, organic fertilizers, poultry litter, poultry litter plus ammonium nitrate, and poultry litter plus urea in forage systems were also viewed.



Environmental Conference

Recently there have been environmental inspections on some East Texas dairies. On Oct. 27, the annual East Texas Environmental Stewardship Conference will be held from 9 a.m. to 3 p.m. at the Southwest Dairy Museum in Sulphur Springs. Program topics were selected to address some of those inspection issues and include: cooling pond management, what to expect during inspections, lagoon sludge management, mortality management, and new soil sampling requirements. Lunch will be served for those in attendance. Five continuing education credits for producers in the Dairy Outreach Program Area (DOPA CEUs) will be available.

Southwest Dairy Day

Held at Sierra Dairy in Dublin, dairy producers allied with the dairy industry and Texas AgriLife Extension Service had the opportunity to see new technologies, such as a high-tech calf ranch and cross-ventilated dairy.

“This year’s event featured the new technologies incorporated at Sierra Dairy to improve cow comfort,” said Dr. Ellen Jordan, AgriLife Extension dairy specialist based in Dallas.

Sierra Dairy features free-stall barns, a cross-breeding program, weeping-wall manure separation system and a 60-stall rotary parlor that supports a milking herd of 3,500 cows.

“There were a number of activities that producers participated in,” said Dr. Todd Bilby, AgriLife Extension dairy specialist in Stephenville. Some demonstrations presented provided two hours of Dairy Outreach Program Area educational credit for those producers with environmental permits.

Dr. Saqib Mukhtar, AgriLife Extension engineering specialist based in College Station, discussed how weeping walls work as an alternative manure separation technology.

Jacob Eickstead and Mark Atwell, AgriLife Extension also based in College Station, demonstrated proper manure spreader calibration so producers can more accurately match the amount of nutrients to crop needs.

AgriLife Extension would like to thank all participants as well as sponsors for this successful event.

News from the TVMDL

In order to standardize blood sample collection and improve results for blood analysis, such as metabolic profile and trace mineral analysis; the TVMDL has released a fact sheet containing several tips for veterinarians and dairy producers on how to properly collect, label, store and ship blood samples for analysis.

A blood sample submitted for analysis might have high variation if it is not collected and stored properly.

For more information contact Dr. Daniela R. Bruno or Dr. Robert Sprowls at the TVMDL, (806) 353-7478.



Diagnostic Lab. Supporting Dairy Producers in the Panhandle of TX

The TVMDL in Amarillo has set up a milk quality laboratory offering routine milk microbiology including Mycoplasma culture and speciation by PCR testing.

In addition, the laboratory offers both of the tests to detect cattle persistently infected with BVD, antigen capture ELISA (fresh ear notches) and immunohistochemistry (fixed ear notches). The lab also offers PCR testing for BVD in bulk tank milk samples.



People from the Texas dairy industry

You can ask a question of
the Dairy Team at:
texasdairymatters@ag.tamu.edu

In this first issue of our Texas Dairy Newsletter we would like to introduce the dairy team.



Dr. Ellen Jordan

Dr. Ellen Jordan is a Texas AgriLife Extension Service dairy specialist based in Dallas. Her areas of expertise are in reproduction and nutrition. She co-developed the Heatsynch protocol and also has been working with herds in developing control programs for Johne's Disease. Jordan is past president of American College of Animal Nutrition and treasurer of American Dairy Science Association



Dr. Todd Bilby

Dr. Todd Bilby has both a Texas AgriLife Extension Service and Texas AgriLife Research appointment and is based in Stephenville. His duties include providing leadership and coordination for educational programs in dairy management via applied research, workshops, tours and field days. Research efforts include integrating categories of cattle management, reproduction, nutrition and heat stress.



Dr. Ralph Bruno

Dr. Ralph Bruno is a Texas AgriLife Extension Service associate based in Canyon. Previously, Bruno was dairy production clinician at the VMTRC, University of California – Davis. He will continue providing technical expertise for cooperating dairy herds, including farm personnel training. He has been working in the area of reproduction, nutrition, dairy herd health and management, epidemiology, milk quality and data record analysis.



Kevin Lager

Mr. Kevin Lager is a Texas AgriLife Extension Service associate based in Canyon. His research focuses on differing forms of phosphorus supplementation to reduce phosphorus excretion. He has worked on the Kansas State University dairy in a variety of capacities including herd health, reproduction, nutrition, facility management and new employee training. Lager was raised on a western Kansas dairy.

Save the date:

Oct. 8, 2009 – Working together to preserve our water – Hereford – <http://texasdairymatter.org>

Nov. 2–5, 2009 – 18th ADSA Discovery Conference - Effect of the Thermal Environment on Nutrient and Management Requirements of Cattle - www.adsa.org/discover

Nov. 12–13, 2009 – Dairy Cattle Reproduction Council (Eastern) – St. Paul, Minn. – www.dcrcouncil.org

Nov. 19–20, 2009 - Dairy Cattle Reproduction Council (Western) – Boise Idaho– www.dcrcouncil.org

Jan. 31 – Feb. 3, 2010 - 49th National Mastitis Council Meeting - Albuquerque, N.M. - <http://www.nmconline.org>

Texas Dairy Newsletter is produced by the Dairy Team of Texas AgriLife Extension Service/ Texas A&M System. Dr. Ralph Bruno, WTAMU Box 60998, Canyon, TX – 79016; Phone: (806) 651-2620; Fax: (806) 651-2504; E-mail: rbruno@ag.tamu.edu; Dr. Todd Bilby, E-mail: trbilby@ag.tamu.edu; Dr. Ellen Jordan, e-jordan2@ag.tamu.edu; Kevin Lager, kjlager@ag.tamu.edu; Dairy Team, texasdairymatters@ag.tamu.edu. Stop the Dollar Drain articles are based in peer reviewed research and edited by the Dairy Team.

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