

VETERINARY MEDICINE TEACHING AND RESEARCH CENTER (VMTRC)

♦ Healthy Cows ♦ Productive Herds ♦ Confident Consumers ♦

The VMTRC is a leading educational and research organization for dairy production medicine and herd health. The Center strives to provide relevant solutions for enhancing cow health and promoting productive and sustainable cattle herds that produce safe and wholesome products. VMTRC faculty and clinician areas of expertise include epidemiology, food safety, young stock management, ruminant nutrition, udder health, milk quality, theriogenology, microbiology, animal welfare and animal health economics.

Strategic location – The VMTRC is located in the center of the nation’s largest dairy cattle population. Tulare County’s population of 484,845 dairy cows represents over 27% of all dairy cows in the State of California and 6% in the United States.

The Center hosts a wide array of dynamic **educational outreach activities** for food animal producers and the veterinary profession, including:

- Dairy cattle welfare workshops
- [The Dairy Heat Stress Road Show](#)
- Webinars on current agricultural issues
- Production medicine seminars
- Food animal continuing education programs

Battling Bovine Respiratory Disease – Scientists are collaborating nationally with colleagues to reduce the incidence of bovine respiratory disease (BRD) and economic losses in beef and dairy cattle. BRD is the leading natural cause of death in U.S. cattle and calculated heritability estimates for susceptibility or resistance to BRD range from 17 to 29%.

- Researchers developed a novel scoring system to aid in the accurate diagnosis of bovine respiratory disease in pre-weaned dairy calves. The new scoring system utilizes objective and easy-to-obtain criteria, and the simplicity of the tool makes it feasible for on-farm use by producers and calf caregivers.
- Investigators are developing a risk assessment tool for dairy producers to improve management, diagnosis, and treatment of bovine respiratory disease in dairy calves. This tool will help reduce the economic losses due to this disease and will improve dairy calf welfare.

Identifying pathogens – The VMTRC is the home of a nationally-recognized reference lab for accurate identification of pathogenic species of *Mycoplasma* organisms which cause highly contagious bovine mastitis.

Pioneering new methods of evaluation – Several methods were developed by VMTRC scientists to evaluate feed management and dairy calf and cow performance:

- Feed markers (lignin, fat and chloride) to test feeding consistency
- Ultrasound of muscle and fat to identify calves that do not have adequate nutrient stores
- Rumen pH and blood parameters to improve feed efficiency, milk production and milk components

Extending the shelf life of milk - A study showed that ultraviolet light – if used as an addition to pasteurization of fluid milk - can extend the shelf life of milk an additional three weeks with minimal impacts on sensory quality.

Combatting *E. coli* – As part of a large-scale research effort focused on preventing potentially fatal illnesses linked to *Escherichia. coli* bacteria, scientists conducted research aimed at reducing the occurrence of pathogenic *E. coli* on cattle hides during processing. One project revealed that the combination of sodium dodecyl sulfate and lactic acid reduces the risk of pathogenic *E. coli* contamination on the hides.

Focusing on food safety

- Cases of botulism in dairy cattle prompted scientists to investigate this potential food safety concern to learn what happens when dairy cattle accidentally ingest feed contaminated with the botulinum toxin. Results suggested that *Clostridium botulinum* type C toxin does not cross from the blood to the milk in detectable concentrations.
- A three-year study was conducted to evaluate mussels as bioindicators of fecal contamination in coastal ecosystems of California. The study showed that mussels can be used to monitor water quality in California.

Improving calf health

- In order to reduce antibiotic use, a recent project determined that supplemental colostrum during the first two weeks of life can reduce diarrheal disease in preweaned calves on calf ranches, and thereby reduce the amount of antimicrobial treatments needed.
- Researchers found that feeding *Saccharomyces cerevisiae* yeast culture in grain improves health, minimizes frequency of health treatments, and reduces risk of morbidity and mortality in dairy calves.
- In a novel study, researchers have determined that calf-raising facilities could benefit from the implementation of consistent standard operating procedures and farm worker training for proper pasteurization of waste milk used to feed calves in order to reduce pathogens.



International Veterinary Collaboration for China (IVCC) – Faculty engaged in an international alliance with the Chinese government called the China Veterinary Collaboration are assisting Chinese dairies in adopting practical, standardized management tools to assure food safety. The Center led one of the group's first programs, a pilot project to help Chinese dairies produce consistently high-quality milk products.

Exploring differences in grass-finished and grain-finished beef - A comparison of grass-finished and grain-finished Angus cross steers showed that grass-finished cattle take more time than grain-finished cattle to reach optimal fat development. However, when taste-testing panels were conducted, participants found no difference in flavor between the grass-finished and grain-finished meats.

Making cows more comfortable and productive

- Faculty have found that adding shades and fans to a feed bunk-mounted sprinkler system on Holstein cows during summer heat stress resulted in a significant increase in total first 60-day milk production, producing an economic benefit over the preexisting cooling system.
- Researchers evaluated the effects of rubber flooring on the development of cow claw lesions, locomotion scores, clinical lameness, and rates of hoof growth and wear, proving that a soft flooring surface, such as interlocking rubber mats, is beneficial for hoof health.

Reducing the impact of wastewater runoff

- Researchers discovered that vegetated buffer strips and straw mulch significantly reduced the protozoal concentrations in storm runoff. They also discovered that grassland buffers are an effective method for reducing animal agricultural inputs of waterborne *E. coli* into surface waters. These findings are assisting working dairies in their efforts to improve farm and ecosystem health along the California coast.

- Researchers investigated Radiofrequency (RF) power as a new, nonchemical way to disinfect wastewater from dairy and animal facilities. RF technology is an exciting potential alternative for the disinfection of dairy or animal farm wastewater before recycling.

Keeping cattle and consumers safe

- VMTRC faculty are engaged in on-farm dairy herd evaluations of animal care and well-being as part of the National Dairy FARM Program. This important process assures customers and consumers that dairy cattle on today's farms are cared for and treated responsibly.
- Scientists developed a novel real-time test for detecting bovine, ovine, and caprine contaminants in livestock feed.

Community education and outreach

- The Center participates in a number of farm and nutrition events throughout the year, reaching out to over 1,200 students and 45 teachers in Tulare, Kings, and Fresno counties. These events help students and teachers explore healthy food choices, learn how food is grown, interact with farm animals, and learn about careers in agriculture.
- Three times a year, VMTRC and California Animal Health & Food Safety CAHFS faculty and staff present information about the Center's teaching, research and service programs to the Education & Agriculture Together (E.A.T.) Foundation. The E.A.T. Foundation is a non-profit organization designed to increase public school educators' knowledge and understanding of the agriculture industry and to equip them with the appropriate tools to educate future generations regarding the importance of agriculture and rural stewardship.
- The Center provides many service programs and tours to the public, 4-H and FFA groups, government officials and dairy industry-related groups, as well as local K-12 schools, community colleges and international educational programs.

