



Reproductive Performance in Domestic Ruminants

If technologies developed by W-1112 scientists are implemented, estimated yearly savings to the beef cattle industry could exceed \$2.5 billion due to increased conception rates, decreased feed costs, and fewer deaths from diseases.

Who cares and why?

Poor reproductive efficiency in domestic ruminants (e.g., cattle, goats, sheep) is widely regarded as the most limiting factor to profitability in animal production systems and is a growing problem in the West. Livestock production is a critical component of the economic health of western states, and the U.S. supply of livestock and products is dependent on the production efficiency of western farms and ranches. The W-1112 project's primary stakeholders are farmers and ranchers in the West, but the work has broad applicability to these industries nationwide. Secondary stakeholders are consumers of animal products, who benefit from reduced prices associated with efficient animal production systems. Additional stakeholders include citizens of communities in the West whose economies are improved by their proximity to profitable and sustainable animal industries. This cooperative research group seeks to bring diverse expertise to bear on factors that limit fertility in ruminants and to provide products, techniques, and outreach materials for the benefit of animal producers in the western region.

What has the project done so far?

Established in 1970, this project's original purpose was to combine basic and applied expertise to determine factors and develop methods that improve fertility of domestic ruminants in western states. The project now involves scientists from 18 states where more than 50 percent of the nation's breeding cows (beef and dairy) and 64 percent of its breeding ewes exist. The original philosophy and mission—to conduct cooperative multi-state research that provides product and technique development and outreach for the benefit of animal producers in the western region—continue to guide the group. From 2006 to 2011, project participants generated 349 refereed publications and technical bulletins and seven book chapters. The group also presented a symposium of research findings to a nationwide audience of livestock producers at the 2007 Beef Improvement Federation Meetings in Fort Collins, Colorado. Related current and previous research by project participants continues to be based on the premise that applied research experiments stem from a foundation of previous basic research studies.



Tom Geary, a USDA scientist, performs an ultrasound on a pregnant cow. Photo courtesy of USDA.

Impact Statements

Designed more effective estrus synchronization methods and new protocols that increased pregnancy rates through artificial insemination by 10 to 15 percent. Using this approach with 10 percent of U.S. beef and dairy cows could result in an overall economic impact of greater than \$400 million to the U.S. cattle industry and allied industries.

Identified animals that most effectively use feed resources (i.e., they eat most of the predicted amount of feed), saving producers \$20 to \$40 per cow. On a national basis, this technology has the potential to save cow-calf producers \$800 million to \$1.6 billion in annual feed costs.

Developed a vaccine for epizootic bovine abortion that could save beef producers in California alone \$10 to \$15 million annually due to increased numbers of calves born.

Developed methods to control bovine viral diarrhea virus that could save U.S. cow-calf producers \$481 to \$632.5 million annually by increasing calf viability.

Recommended U.S. Food and Drug Administration approval of progesterone CIDR (controlled intravaginal drug release) use in sheep, which would give producers a way to increase pregnancy rates, shorten lambing intervals, and reduce the number of open ewes in a flock.

Determined that selecting calves based on temperament can increase weaning weights by 5 to 6 percent and provide a 15- to 18-pound weight gain advantage in stocker calf operations.

Gained a better understanding of mechanisms that affect early embryonic loss, animal reproductive behavior, gamete quality, and prenatal programming, which will dramatically increase the pounds of marketable animals/product for producers, increasing their profitability.

Found that increasing pregnancy rates by 20 percent would result in a higher number of older, heavier, and more valuable calves at weaning.

What research is needed?

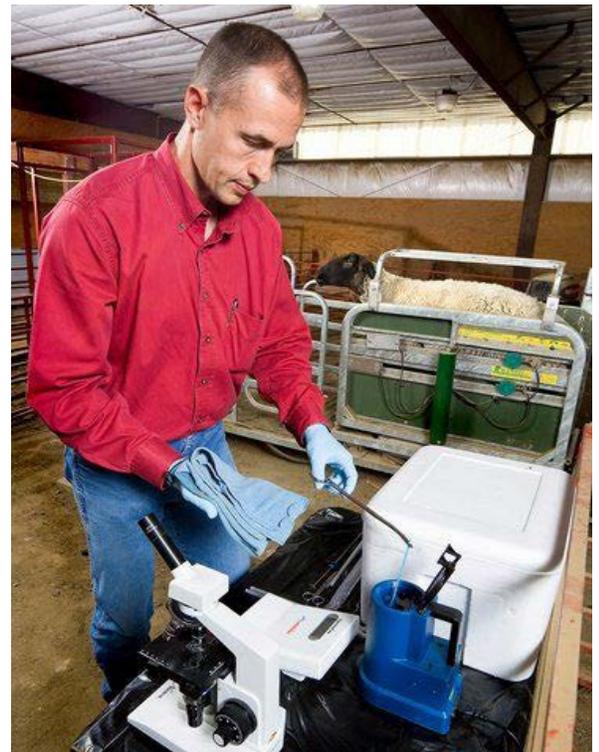
In spite of significant improvements, reproductive efficiency is still widely regarded as the most limiting factor to profitability in animal production systems. Further work in this regard is still the number one priority of this project.

Want to know more?

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This project was supported by the Multistate Research Fund (MRF) established in 1998 by the Agricultural Research, Extension, and Education Reform Act (an amendment to the Hatch Act of 1888) to encourage and enhance multistate, multidisciplinary research on critical issues that have a national or regional priority. For more information, visit <http://www.waaesd.org/>.

Edited and designed by Sara Delheimer



A researcher prepares a sperm sample for artificial insemination in a Suffolk ewe. Photo courtesy of the University of Wyoming.