

Research Funding Tops \$74,000 in 2007

The AJCC Research Foundation and the US Jersey organizations have committed \$74,052 to fund seven scientific investigations related to Jersey dairy cattle for 2007. Six of the projects were selected from proposals received in response to the Foundation's annual Request for Proposals. The seventh is a directed investigation.

This is the largest amount ever allocated by the Jersey organizations in a single year for research. Funding from the AJCC Research Foundation totaled \$34,252, from the American Jersey Cattle Association (AJCA), \$15,000, and from National All-Jersey Inc. (NAJ), \$24,800.

With this year's funding, the 20-year total for Jersey-specific research reached \$753,524.

Embryo Techniques

Two studies related to freezing of Jersey cattle embryos were funded. Principal investigators are Curtis R. Youngs, Ph.D., of the Department of Animal Science at Iowa State University; and Samuel Prien, Ph.D., Director of the Clinical and Research Laboratories in the Department of Obstetrics and Gynecology at Texas Tech University, with a joint appointment in the Department of Animal and Food Sciences.

"Embryo cryopreservation is a hit or miss proposition," observes Dr. Prien. "Certain species appear to freeze and thaw well, producing significant pregnancy rates. However, given current technology, there are also those species whose embryos are considered incapable of freezing. Even within certain species that freeze well, there are individuals or breeds that do not withstand the cryopreservation process. Such appears to be the case with Jersey cattle.

"While a number of theories have been put forth, little is truly known as to why these embryos don't survive the cryopreservation process."

At Iowa State, Dr. Youngs and co-investigators James K. West, D.V.M., and Marianna Jahnke of the Department of Veterinary Diagnostic & Production Animal Medicine will test the hypothesis that lowered cryotolerance of Jersey embryos is related to inadequate dehydration due to high lipid content.

The researchers will place embryos in the compact morula and expanded blastocyst stages into four different cryoprotective

agents. Computer images will be obtained to assess the best equilibration times of each developmental stage in each medium. Embryos will be frozen using conventional slow cool/fast thaw methods, and thawed embryos will be evaluated for blastocyst formation, embryo hatching, and embryonic cell number.

These data will be useful in refining conventional slow cooling/rapid warming cryopreservation protocols, as well as the development of ultra-rapid freezing protocols via vitrification.

The funding for Dr. Prien at Texas Tech will support an ongoing research program examining the micro-chemical makeup of Jersey embryos in comparison to embryos of other cattle species known to freeze well. The findings may be useful in developing freezing media specific to the unique chemistry of Jersey embryos and/or modifying current protocols to optimize freezing methods, then potentially a field trial to determine the effectiveness of new methods and procedures.

Mastitis and Immune Response

Milk somatic cell counts (SCC) and the incidence of mastitis differ by cattle breed. A recent large scale survey reported that Jersey populations in the U.S. have higher milk SCC than Holsteins. Interestingly, three separate studies have identified lower frequencies of mastitis in Jersey cows than in Holstein cows.

These conflicting findings will be addressed in a study by Douglas D. Bannerman, Ph.D., of the Bovine Functional Genomics Laboratory, Beltsville, Md.

He will evaluate the ability of Holsteins and Jerseys to clear intramammary infections and then determine if different immune responses are elicited. The study will use two major mastitis pathogens, *E. coli* and *S. aureus*. "In mid-lactation, *E. coli* are often readily cleared from the gland, whereas *S. aureus* establishes a persistent chronic infection. This suggests differential immune responses are elicited to these bacteria," Dr. Bannerman explains. "The immune markers for *E. coli* and *S. aureus* infections have been well-characterized, allowing us to characterize breed differences since we know which critical immune markers to look at."

There are three possible outcomes from the proposed research: (a) no breed differ-

ences are identified; (b) Holsteins clear one or both pathogens more readily; or (c) Jerseys clear one or both pathogens more readily. The third outcome is hypothesized based on the anecdotal observations in peer-reviewed studies.

Death Losses

A detailed investigation of factors associated with cow mortality was funded, to be conducted by Gary W. Rogers, Ph.D., of the University of Tennessee, John Clay, Ph.D., Director of Dairy Records Management Systems (DRMS), and Dr. Fred Hopkins, professor of veterinary science at the University of Tennessee.

"Many herd and management risk factors for cow mortality are currently unknown," Dr. Rogers explains. "It is also unclear if genetics plays a role in cow mortality. Breed effects may be important for cow mortality since they are important for productive life. Jersey cows have longer average productive life and may have a lower mortality risk than Holstein cows."

The project will also evaluate the potential of current genetic evaluations for traits like productive life, daughter pregnancy rate, strength and dairy form to predict cow mortality rates. Plus, "daughter groups may differ in mortality rates," says Dr. Rogers. "If daughter groups differ in mortality rates, bulls could potentially be summarized for daughter mortality rates and these summaries used to improve disease resistance and cow survival."

Feed Efficiency in Jersey Crossbreds

Funding was approved for a study comparing feed efficiency of crossbred Jersey-Holstein cows with that of their pure Holstein contemporaries at the University of Wisconsin. Kent A. Weigel, Ph.D., Extension Dairy Genetics Specialist, and Randy D. Shaver, Extension Dairy Nutrition Specialist, will conduct the study.

Dry matter intake, milk yield, milk composition, body weight, and body condition score of individual cows will be monitored for 15 weeks, beginning at 50 days postpartum. Efficiency of producing fat- and energy-corrected milk will be evaluated for each breed by parity group before, during, and after the peak of lactation. Data from this study will be a critical component of overall calculations of lifetime net profit

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for each breed group, as the feed efficiency data will be combined with additional information regarding fertility, dystocia, stillbirths, calf mortality, rearing costs, lameness, mastitis, metabolic health, longevity, salvage value, and other economically important traits.

Jersey Beef Nutrition and Muscle Growth

National All-Jersey Inc. funded an intensive study of growth and development of Jersey steer calves fed at different en-

ergy levels for lean meat production. It will be conducted by Chad J. Mueller, Ph.D., assistant professor of beef cattle systems at Oregon State University.

“Beef operations have an interest in feeding Jersey calves for meat production due to the low input costs and the propensity to generate high quality, marbled carcasses,” Dr. Mueller explains. “Due to a lack of known growth parameters, feedlot operators are simply using trial-and-error to feed out these calves. This has resulted in over-conditioned carcasses and reduced

growth efficiencies, both of which have limited the usefulness of Jersey steers in feedlot operations.”

Calves will be assigned to one of two treatment groups (85% concentrate:15% roughage diet, or 70% concentrate: 30% roughage diet), with intakes monitored using Calan gates. Measurements will be taken every 30 days, starting at two months of age, to determine changes in backfat depth, marbling and ribeye muscle area, and skeletal growth throughout the grow-

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ing and finishing periods.

Final carcass data (carcass weight, backfat, ribeye area, kidney-pelvic-heart fat and USDA quality and yield grades) will be analyzed.

“Data from this study will allow feedlot operators to optimally feed Jersey steer calves to maximize financial returns while achieving optimal growth and meeting consumer demand for high quality, marbled beef,” says Dr. Mueller.

“This in turn should result in greater demand for Jersey bull calves by the beef feedlot industry, and subsequently increase the financial return to dairy producers for

their male calf offspring.”

Early Plane of Nutrition and Feedlot Performance

A directed large-scale, longitudinal field trial with calf-fed Jersey steers was funded jointly by NAJ and AJCA.

The first phase, from birth to 16-17 weeks of age, will evaluate growth, feed efficiency and health of Jersey bull calves raised on two different nutritional planes of protein and caloric intake from milk replacer and starter. Thomas Earlywine, Ph.D., of Land O'Lakes Animal Milk Products Co. is the lead investigator.

Dr. Richard A. Zinn of the Desert Re-

search and Extension Center, University of California, El Centro, will conduct the study's second phase, a characterization of feedlot growth and performance by the steer calves from 16-17 weeks of age until harvest. This study will analyze relationships between the starting planes of nutrition for the calf-fed steers and parameters including pattern of growth on high energy growing/finishing diets and growth implant use; feed efficiency; mature weight; dressing percentage, ribeye area, fatness, and marbling score; and meat tenderness, sensory panel and consumer evaluation. This trial will be a larger replicate of the NAJ project funded in 2006,