

**AGRICULTURAL RESEARCH FOUNDATION
INTERIM REPORT
FUNDING CYCLE 2017 – 2019**

TITLE:

A Comparison of Performance Factors among United States-genetics Holsteins, US-genetics Jerseys, US-genetics Jersey x Holstein crossbreds, and New Zealand-genetics Jersey x Holstein Crossbreds on a Pasture-intensive Management System

RESEARCH LEADER: Jenifer Cruickshank

COOPERATORS: Troy Downing

EXECUTIVE SUMMARY:

Based on the historical and current differences in production systems and in selection indexes, one would expect that New Zealand (NZ) cows and North American cows, even of the same breed, are genetically different from each other. Given that the climate of western Oregon is very similar to the climate of New Zealand, some of these NZ cows may perform well here, especially on farms where grazing is a key component.

The Oregon State University Dairy currently has 20 NZ-genetics Holstein x Jersey crossbred heifers that calved in February–August 2017. The Dairy also has 10 younger NZ-genetics crossbred heifers that will calve this year (2018). Also part of the OSU dairy herd are US purebred Holsteins and Jerseys. Having three groups, US Holsteins, US Jerseys, and NZ crossbreds gives us the opportunity to compare their performance in growth, reproduction, milk production, and their health measures. However, any observed differences between the crossbreds and the purebreds would be confounded: it would be impossible to determine whether the differences were due to the genetic background (US vs. NZ) or being purebred vs. crossbred.

The older cohort of NZ cows produced 10 heifer calves in April–August of 2017. Funds from this grant are being used to purchase Holstein-Jersey crossbred heifers from farms in the region. These acquired US crossbred heifers are age-matched with the crossbred calves born on the OSU Dairy last year. We will be able to make comparisons across the two purebred and the two crossbred cohorts, allowing for a more precise assigning of the genetic contributions to performance. Genotyping the crossbred heifers with a dense SNP chip (providing ~770,000 SNP genotypes [=DNA markers]) will allow us to quantify just how genetically different the US and NZ crossbred animals are from each other.

OBJECTIVES:

- Record and compare the performances of US Jersey, US Holstein, US crossbred, and NZ crossbred groups in growth, reproductive measures, production measures, feed efficiency, and health in an intensive grazing system.
- Characterize the genetic differences between the two crossbred groups.

- Relate genotype differences to phenotypic differences in performance traits between the two crossbred groups.

PROCEDURES:

1. Acquire 10 Holstein-Jersey cross heifers with North American genetic origins. The acquired heifers are age-matched to crossbred heifers at the Dairy. They are also the products of multiple generations of crossbreeding (no first-generation F1).
2. Collect phenotypic data (milk production, health, heat tolerance, etc.) from purebred and crossbred animals.
3. Genotype the crossbred animals with the high density SNP chip and examine the data for similarities and differences.

SIGNIFICANT ACCOMPLISHMENTS TO DATE:

Four heifers have been purchased. Efforts are ongoing to identify and acquire six more suitable candidates. Phenotyping and genotyping will commence once all project animals are in place at the OSU Dairy.

ADDITIONAL FUNDING RECEIVED DURING PROJECT TERM: none

FUTURE FUNDING POSSIBILITIES: There are none yet specifically identified.