Presenter: Matthew Fonda

Class Standing: Senior

Department: Environmental Biology

College: Science

Co-presenter: William Chiu, Jerrick Joya, Sara Ramnath, and Melissa Schwartz

Faculty Mentor: Dr. Shelton E. Murinda

Presentation Type: Poster presentation

Project Title: Assessing Effectiveness of Pulsed Electromagnetic Field Therapy (PEMFT) Treatment of Cow Udders on Bovine Mastitis Causing Bacteria

Synopsis: Confirming the effectiveness on Pulsed Electromagnetic Field Therapeutic treatment of cow udders to reduce bovine mastitis infections

Abstract: In the US, mastitis infections in dairy cows account for 2-4 billion dollars in financial losses for dairy farms nationwide, and about 200 dollars per cow each year. Early treatment of these cows is crucial for maintaining the income of dairy farmers. The most common bacteria responsible for bovine mastitis include Staphylococcus aureus, Escherichia coli and Streptococcus species. Pulsed-field electromagnetic therapy (PFEMT) was used to treat udders of mastitic dairy cattle (15 cows at two dairy farms in Chino and Ontario, CA), and quarter milk (QM) samples were collected to examine the effect of this technique on the fate of infecting pathogens. Samples were taken on day 0, 2, 3, 4, and 5 after PFEMT-treatment to determine the effect of the treatment on reduction of infecting bacteria. Additional QM samples were collected on day 24 and 28 post-PFEMT to verify clinical treatment. Over 380 QM samples were collected. Bacteria were isolated from the milk and morphological and biochemical tests were performed to identify the isolates. Staphylococcus aureus, Streptococcus spp., Bacillus spp. and coliforms were the predominant presumptive species identified. Pathogen-specific PCR protocols were developed to confirm the identity of the bacterial isolates. We will report our current progress on the pathogen confirmatory tests and validate potential use of PEMFT in treatment of mastitis in dairy cows.