1145-92-1752 **Kelley France*** (`kwarren3@uco.edu`), **Brittany Bannish** and **Sean Laverty**. *Got Milk? Modeling a Dairy Allergy: Oral Immunotherapy and the Immune Response.*

The Centers for Disease Control & Prevention reports that the prevalence of food allergies in children increased by 50 percent between 1997 and 2011, and continues to rise. There is no cure and treatment and diagnostic protocols are limited. Understanding the dynamics of one treatment strategy, Oral Immunotherapy, is crucial to uncovering the potential for a cure. We build a differential equations model to study the interaction of a dairy allergen with helper T-cells and dendritic cells. Specifically, we are interested in how consistent exposure to an allergen can switch the production of Th2 helper T-cells (responsible for anaphylaxis) into production of Th1 helper T-cells (which do not produce an allergic reaction). Taking into account Th2 cells, Th1 cells, naive helper T-cells, Il-4 and Il-2 cytokines, and dendritic cells, we model the immune response to allergen exposure. We present our model and results, identifying conditions under which the Th1 cells outnumber Th2 cells, thereby changing the body's reaction to an allergen. We conclude by discussing the dynamics for various parameters. (Received September 24, 2018)