1116-92-2374 **Sarah Bartlett Minucci*** (sarah.minucci@gmail.com), LU Box 2040, 1120 North Ocoee Street, Cleveland, TN 37311, and **Stephen J. Merrill**. *The relationship between leptin and inflammation in adipose tissue determines critical points in excess nutrition in women.*

Research shows a significant relationship between leptin, a hormone involved in energy intake and expenditure, and inflammation in adipose tissue, the main depot of fat storage. These findings suggest an important factor in the drastic weight increase associated with obesity: a cycle of inflammation due to increases in leptin levels. This inflammation and subsequent weight gain, as well as difficulty in losing weight, could help explain why lifestyle changes are often not enough to mitigate obesity. The pleiotropic role of leptin not only points to its influence in obesity, but also its comorbidities, including type 2 diabetes and heart disease as well as in general immune system dysfunction. In fact, leptin seems to be a crucial factor in the prevalence of autoimmune diseases in women, especially women with greater amounts of adipose tissue. Through construction of a mathematical model of the relationships between leptin, inflammation, and adipose tissue, we can better understand the role of leptin in adipose tissue inflammation, specifically in women. Insight into these relationships is necessary in better treating obesity, understanding the sexual dimorphism of immune system dysfunction, and determining risk for autoimmune diseases and obesity-related health complications. (Received September 22, 2015)