Obesity is a growing problem within our nation. This problem stems from the behavior of consuming copious amounts of food and not reciprocating with increased physical activity. The thyroid hormone, triiodothyronine (T3), plays a key role in metabolism. T3 levels decrease in humans and rats during food restriction, and energy restriction also suppressed energy expenditure, but the underlying molecular mechanism is not yet fully understood. To learn more about this, we chose to examine the effects of calorie restriction in low-capacity rats (LCR) and high-capacity rats (HCR) that have been selectively bred: LCRs have low energy expenditure and prone to gain weight, while HCRs have high energy expenditure and are lean. For both groups of animals, we hypothesized that calorie restriction would lower T3 concentration after 21 days. Calorie restriction induced weight loss in both groups. The HCR tended to lose a greater proportion of their weight. Blood plasma was collected from rats with unlimited access to food (Ad Lib), and rats that were calorie restricted for 21 days (CR21). Samples were prepared in an ELISA plate to test for the light absorbance of each well, indicating plasma T3 levels. We found that neither group (lean vs. obesity-prone) nor CR significantly affected plasma T3. This suggests that the decrease in energy expenditure seen during food restriction is not solely attributable to changes in T3.