REDUCED ENERGY EXPENDITURE IN MICE FED LOW MAGNESIUM DIETS
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This project determined the effects that a low magnesium diet has on metabolism. Due to the vital role of magnesium in enzymes involved in metabolism, we predicted that magnesium restriction would result in a reduction in metabolic rate and oxygen consumption. We tested this hypothesis using 8 week old, male, C57BLK/6J mice. Twenty-four mice were fed a diet low in magnesium (100 mg MgO / kg chow) for three weeks, after which they were divided into two groups. For one week, one group remained on the same low magnesium diet, while the other group followed a re-feeding phase with control magnesium levels (500 mg Mg bisglycinate / kg chow). Body composition data was measured using Nuclear Magnetic Resonance (NMR) and metabolic data was collected using Comprehensive Laboratory Animal Monitoring System (CLAMS).

There was no change in body weight, however, body composition was improved in mice on restored magnesium diets compared to mice maintained on low magnesium diets. Restoring magnesium levels increased percent body fluid and significantly reduced body fat. Mice on restored magnesium diets also had increased O\textsubscript{2} consumption, CO\textsubscript{2} production, and energy expenditure, which was correlated with greater physical activity as evidenced by a higher number of laser beam breaks on the X, Y and Z-axis of each mouse cage. Overall, this data indicates that a low magnesium diet significantly reduces metabolic rate, increases body fat, and reduces physical activity, all of which can be reversed by just one week of supplementation with magnesium bisglycinate.