Name(s)

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Project Number

J0504

Project Title

Wave Rave: A Competitive ELISA for the Quantitative Analysis of Vitamin B12 before and after Micro-Radiation Exposure

Abstract

Objectives

The goal of this project is to determine the effects of electromagnetic micro radiation on Vitamin B12 levels in foods after heating them in the microwave.

Methods

RIDASCREEN FAST Vitamin B12 kit, various food samples, RidaSoft Win.Net software. Prepared liquid and solid samples (with and without heating in the microwave). Performed procedure for competitive ELISA (antigen-antibody reactions). Measured absorbance rates of samples photometrically at 450 nm.

Results

After exposure to micro radiation, both rice and baby oatmeal decreased in Vitamin B12 concentration while the milk increased in B12 levels. The B12 levels in chicken broth were initially high, so the photometric readings were not affected by the micro radiation.

Conclusions

The data reveals that Vitamin B12 concentrations changed in milk, rice, oatmeal, but not broth after being microwaved. With these results, people may decide to microwave foods for shorter amounts of time if aware that microwaving foods can deplete their nutrients. Frozen food manufacturers may want to consider how the results might impact their industry. Possible variations of this experiment can test different nutrients like calcium or test different amounts of exposure time to micro radiation to determine the best microwave time for certain foods with minimal depletion of nutrients.

Summary Statement

I quantitatively determined, using competitive enzyme immunoassay, the effects of micro-radiation on different foods' Vitamin B12 levels and found that most food samples were impacted by the microwaving process.

Help Received

I received materials and some guidance from Mr. Ross Walden, Regional Manager of R-Biopharm. My project was reviewed by a science teacher, and I compared it to other experiments in this field found on the internet.