Does the ingestion of sesame oil correlate with a decrease in mental stress and decreased cortisol levels in humans?

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Abstract
Many health benefits have been associated with sesame oil including anti-inflammatory effects and protection against radiation damage. Recent studies have also demonstrated the effects of sesame oil in stress reduction in rodents, which suggests possible benefits to humans. Seven individuals ingested sesame oil for three weeks, as well as a placebo for an additional three weeks. There was statistically significant reduced emotional stress associated with sesame oil, but increased physiological stress as indicated by salivary cortisol levels.

Introduction
Sesame seeds (Sesamum indicum), and the oil from these seeds, are commonly used as a food ingredient and for medicinal purposes (Kuo-Ching et al. 2009). Research into the medicinal properties of sesame oil has focused on sesamol (3,4-methylenedioxyphenol), which is derived from a lignin, sesamolin, during the roasting and bleaching process of sesame oil manufacture. (Kuo-Ching et al. 2009, Kumar et al. 2010).

Stress is a problem exhibited by most organisms and, without adaptation, can cause depression or other stress-related illnesses (Kumar et al. 2010). Humans with depression exhibit increased levels of cytokines and oxidative stress (Kumar et al. 2010). Sesamol inhibits cytokine production and oxidative stress and may decrease the physiological effects of stress in humans. Research relating the ingestion of sesame oil to a decrease in emotional stress coupled with blood analysis aimed at detecting the presence of sesamol in the bloodstream has not previously been performed on humans. The purpose of this research project was to determine if the ingestion of sesame oil would affect emotional stress or indicators of a physiological stress response in humans during a high-stress situation.

Methods
This study was approved by the BYUH Institutional Review Board. Sixteen students enrolled in a majors biology course participated in this study and gave informed consent. Participants were arbitrarily divided into two groups, each asked to consume one sandwich per day for 21 days. One group consumed sandwiches prepared with sesame oil and the other with vegetable oil. The participants were not informed as to which type of sandwich they had received. After 21 days participants completed a unit exam for the biology class, provided a saliva sample, and completed a brief questionnaire (Nist and Diehl 1990) to measure anxiety. The saliva samples were analyzed using a Salivary Cortisol Enzyme Immunoassay Kit (Salimetrics, State College, PA). Following the first exam treatment groups were reversed. After 21 days participants again took an exam, provided a saliva sample, and completed the Nist and Diehl questionnaire. The amount of cortisol present in each individual’s saliva was compared to their own previous saliva sample. The responses from the questionnaires completed after the individuals’ first exam were compared to the responses from the questionnaires completed after the individuals’ second exam.

Results
Participants had a mean questionnaire score of 20.42 after three weeks ingesting sesame oil and a mean score of 23.14 after three weeks ingesting the placebo (table 1), with higher values indicating higher test anxiety (Figure 1). A dependent t-test was performed on the participants’ questionnaire scores, and the p-value was determined to be 0.029 (which indicates statistical significance at the 0.05 confidence interval). A dependent t-test was performed on the participants’ salivary cortisol levels and the p-value of the sesame versus placebo trials was determine to be 0.042, which is statistically significant at the 0.05 confidence interval). However, the means of the placebo trial cortisol scores were lower than that of the sesame oil (Figure 2).

Discussion
The results of this study were conflicting. Students reported statistically significantly lower test anxiety scores after three weeks of ingesting sesame oil versus the placebo. The results of this portion of the study indicate that daily ingestion of sesame oil could reduce anxiety. The cortisol levels were significantly higher in the individuals after ingestion of sesame oil, which is the opposite expected effect. This data indicates that ingestion of sesame oil increases cortisol levels, which would indicate anxiety.

A limiting factor of this study was that the number of participants was less than ideal. Originally, 16 individuals agreed to participate in this study. However, only seven individuals continued throughout the six week study and submitted the two required saliva samples and test anxiety questionnaires. Further research, with a larger number of participants, would likely produce more reliable data.

A type II error may have occurred. Salivary cortisol may have been the wrong variable to measure a physiological stress reduction in the participants. More correct measures to measure physiological stress might have included blood pressure or cortisol levels in the blood.

Dietary stress reducers are, in some cases, a positive alternative to medication. More research is needed to determine if sesame oil is an emotional or physiological stress reducer.

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Work Cited