

Health Effects of Daily Peanut Consumption Over a Twelve Week Period

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PURPOSE

The US Department of Agriculture recommends the inclusion of 42.5g of nuts as part of a healthy diet¹. Peanuts are considered a healthy alternative to other snacks as they are a good source of many key nutrients. In addition, peanuts have been shown to reduce the risk of diseases including diabetes and coronary heart disease (CHD)². Peanuts and other nuts impact many CHD risk factors to a greater extent than changes in the lipid profile alone; bioactive compounds and sensory properties may contribute to these health benefits as well³.

Peanut consumption is not associated with weight gain in long-term trials⁴. This is significant due to the current epidemic of obesity in many countries; over 500 million people worldwide are obese⁵.

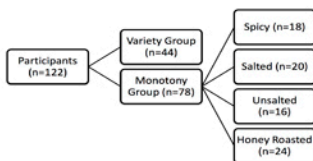
In this study, we aimed to investigate: 1) the health effects of long-term inclusion of peanuts in the diet and 2) the differences in health effects between peanuts of different sensory properties.

References:

1. US Department of Agriculture (2010). Dietary guidelines for Americans 2010.
2. Sabaté J & Arg V (2009). Nuts and health outcomes: new epidemiological evidence. *Am J Clin Nutr*; 89(5): 1643S-1648S.
3. Kris-Etherton PM, Hu FB, Ross E & Sabaté J (2008). The role of tree nuts and peanuts in the prevention of coronary heart disease: multiple potential mechanisms. *J Nutr*; 138(9): 1746S-1751S.
4. Martinez-Gonzalez MA & Bes-Rastrollo M (2011). Nut consumption, weight gain and obesity: epidemiological evidence. *Nutr Metab & Cardio*; 21: 540-545.
5. World Health Organization (2013). Obesity and overweight.

METHODS

Study design: This study utilized a 12-week randomized, parallel-group, two-arm design with study arms that entailed daily consumption of 42 grams of either 1) a single variety (spicy, salted, unsalted, or honey roasted) or 2) three different varieties (14 grams of each). No restrictions were placed on how or when to consume the peanuts. Health parameters were compared between the monotony and variety groups as well as among the different varieties. The study was approved by the Purdue University Biomedical Institutional Review Board.



Participants: Weight stable (<3 kg change in past 3 months) volunteers who were 18-50 years old, were not daily peanut or tree nut consumers, had no GI disease history, were non-smokers, and were not diabetic or hypertensive were included. Participants meeting the above criteria tasted each of the varieties of peanuts and rated them on a general labeled magnitude scale (gLMS). To be eligible for study, participants had to rate at least three of the four types at moderate or greater liking.

Measurements: Systolic and diastolic blood pressure, pulse, weight, fat mass, BMI, and % fat were measured at each bi-weekly study visit. In addition, a fasted blood sample was collected every four weeks to measure cortisol, glucose, insulin, cholesterol, HDL, LDL, and triglyceride concentrations.

Statistical analysis: Data were analyzed using GLM one-way ANOVA with Bonferroni corrections and univariate variables were compared using one-way ANOVA in IBM SPSS (version 19.0, IBM Inc).

ACKNOWLEDGMENTS

We thank Kraft Foods for donating the peanuts used in the study.

RESULTS

Participants: One hundred twenty-two participants (56 males, 66 females) have completed the study. Mean age 26.2 ± 7.2 years and BMI = 23.7 ± 4.4 kg/m². They were randomized into the variety (n=44) or monotony (n=78) groups. The monotony groups included salted (n=20); spicy (n=18); unsalted (n=16); and honey (n=24).

Post-ingestive effects:

• There was no significant difference between the monotony and variety interventions; nor was there significant difference between peanut flavors on any health outcome. Significant differences over time were noted for several outcomes (Table 1).

Table 1. Post-ingestive health parameter changes [mean±SD]

	Systolic BP (mmHg)	Diastolic BP (mmHg)	Pulse Rate (bpm)	Weight (kg)	Fat Mass (kg)	Fat %	BMI
Baseline	121.3±11.4	75.3±7.6	68.6±10.2	69.7±16.9	16.25±9.5	22.4±9.0	23.7±4.4
Twelve Weeks	119.8±12.2	73.2±7.9*	74.0±12.4	70.4±17.0**	16.4±9.2	22.7±8.9	23.9±4.5

	Cortisol (nmol/L)	Glucose (mg/dL)	Insulin (uU/mL)	Cholesterol (mg/dL)	HDL (mg/dL)	LDL (mg/dL)	Triglycerides (mg/dL)
Baseline	537.7±228.5	85.4±7.7	7.7±5.2	167.2±30.0	56.3±14.7	98.6±26.8	95.6±56.5
Twelve Weeks	520.7±244.3	84.6±7.5	8.8±6.5	171.4±33.4	57.4±14.8	102.2±28.7	95.8±57.0

*Significantly different, one-way ANOVA, time effect p=0.012

**Significantly different, one-way ANOVA, time effect p<0.001

Figure 1. Change in diastolic blood pressure over 12 weeks of peanut consumption.

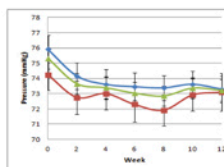
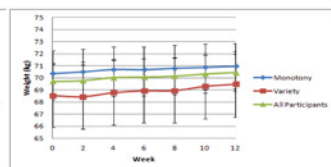


Figure 2. Change in body weight over 12 weeks of peanut consumption.



• Figure 1 shows the change in diastolic blood pressure over the course of the study. There was a significant decrease of diastolic blood pressure over the intervention (P=0.012).

• As illustrated in Figure 2, weight showed a minor increase (P<0.001) over the duration of the peanut consumption trial, but there were no group or type effects. Because there was no control (no peanut consumption) group, weight gain cannot be determined to result from peanut intake.

CONCLUSION

The daily inclusion of 42 grams of peanuts did not lead to any significant changes in cortisol, glucose, insulin, cholesterol, HDL, LDL, or triglyceride levels in this healthy population. Though pulse and systolic blood pressure did not differ significantly, diastolic blood pressure decreased significantly over the twelve week period. Body weight increased significantly, but BMI, fat mass, and fat percentage showed no significant change. Monotony or variety did not affect any of the above outcomes, and the type of peanuts consumed in the variety group had no significant effect as well. Daily consumption of 42 grams of peanuts does not appear to greatly impact any health parameters in a negative manner. A decrease in diastolic blood pressure is consistent with literature researching the cardioprotective effects of nuts. The observed weight gain, though significant, only equals 0.7 kg, or roughly 1.5 pounds, and this is only 25% of the expected gain. Individuals were not instructed to alter any other aspects of their diet or exercise. The weight gain was much less than the expected gain of six pounds derived from an extra 255 kcal per day for 12 weeks.