



A randomized  
controlled study to assess

# PISTACHIO INTAKE, SATIETY AND BODY WEIGHT CONTROL IN HEALTHY ADULT WOMEN:

Acute satiety and energy  
compensation after consumption  
of a pistachio snack and longer  
term consequences on satiety,  
anthropometry, and body  
composition after a 12-week  
nutritional intervention with  
daily consumption of the  
pistachio snack.



## WHY THE STUDY WAS DONE

The High Council of France's public health recommends a daily consumption of a small handful of nuts. This recommendation is based on scientific data that highlights health benefits of nuts, including pistachios, in terms of diet quality, weight management and cardiometabolic risk reduction.

Pistachios are nutrient dense foods containing protein, fibre, phytosterols, and antioxidants and are naturally cholesterol-free. California-grown pistachios have a high monounsaturated fatty acid content (53% of total fat) and a high unsaturated/saturated fat ratio of 7.4: 1.

In spite of their favourable nutrient profile, many consumers are often reluctant to include pistachios frequently in their diet due to concerns regarding weight gain.

In contrast to consumers' reluctance, scientific works suggest that the energy load of nuts such as pistachios promotes satiety and reduce hunger between meals. Satiety is the power of ingested food to inhibit further eating following a meal. Foods with a high satiety value are thought to help control food intake, consume fewer calories in subsequent eating occasions and may play a role in weight management.

Researchers wanted to investigate whether the regular consumption of pistachios by adult women affects their body weight and composition and impacts satiety, energy compensation and nutrient intake.

## OBJECTIVES

The goal of the study was to evaluate the effects of daily pistachio intake on:

- Satiety
- Food consumption behaviour
- Anthropometry and body composition

## TARGET POPULATION

60 healthy, pre-menopausal women ages 18 – 50 who are not regular consumers of pistachios.

## DESIGN

This research was a 16 week randomized controlled open trial, single-centre including two parallel groups of 30 female participants

- 30 women consumed 44 grams (250 kcal) of American pistachios as a morning snack for 12 weeks (experimental group)
- 30 women maintained their current eating habits, and avoided eating pistachios (control group)

Participants' food intake was assessed for two days at the beginning of the intervention, and again for two days at the end, so that days with and days without pistachio snacks could be compared for energy and nutrient intake.

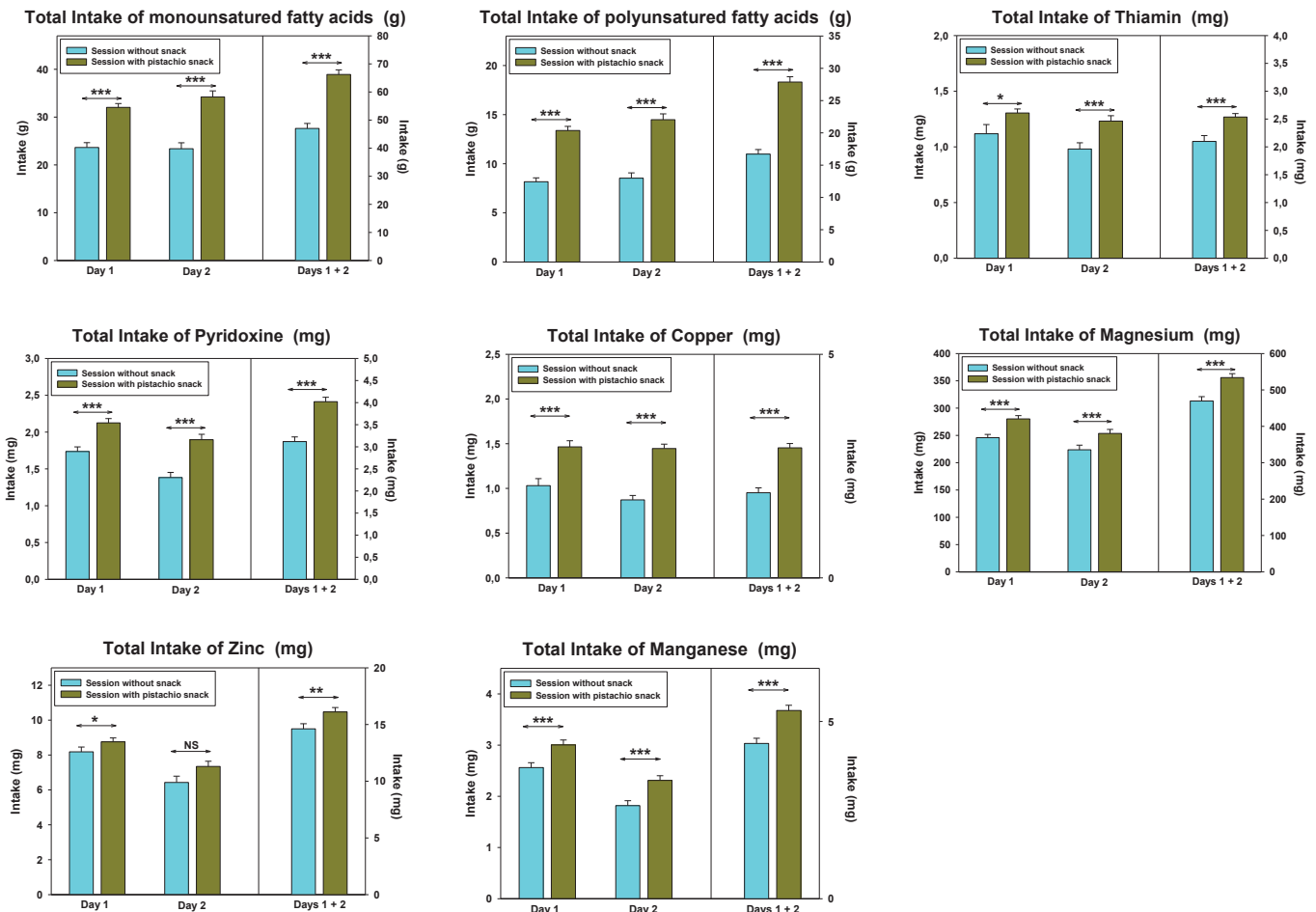
## MAIN OBSERVATION INDICATORS

1. Regular consumption of 44 grams of a pistachio snack for 12 weeks did not cause any increase in body weight or any changes in body composition as assessed by DEXA.
2. There was greater satiety and a feeling of fullness and a lower sensation of hunger, for 2 hours after eating the pistachio snack.
3. There was partial energy compensation at the subsequent meals mostly by a reduction of calories from total and simple carbohydrates and starch.
4. Intake of macro- (mono- and poly-unsaturated fatty acids, linoleic acid) and micronutrients of interest, (thiamin, pyridoxine, copper, manganese, zinc) were significantly higher when women consumed the pistachio snacks than when they did not consume the snacks. There was no increase in the intake of saturated fatty acids or total sugars.

## CONCLUSION

The High Council of public health in France recommends a daily consumption of a small handful of nuts, and pistachios are a perfect food to meet that recommendation. The daily intake of 44 g of pistachios does not result in weight gain and it improves nutrient intake.

**The intake of several macro and micronutrients of interest was significantly increased without an increase of the nutrients that should be limited. The overall body composition remained stable throughout the study.**



# Regular consumption of pistachios does not increase weight or body composition: a randomized controlled study.

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## INTRODUCTION

The French High Council of Public Health recommends the daily consumption of a small handful of nuts. This recommendation is based on scientific data highlighting the health benefits of consuming nuts in terms of quality of diet, weight management and reduction of cardio metabolic risk. The investigators wanted to explore the effect of regular consumption of pistachios on satiety, weight, and body composition.

## OBJECTIVE

Evaluate the effect of the supplemental intake of a regular snack of pistachios on feeding behavior, weight, body composition and anthropomorphic characteristics.

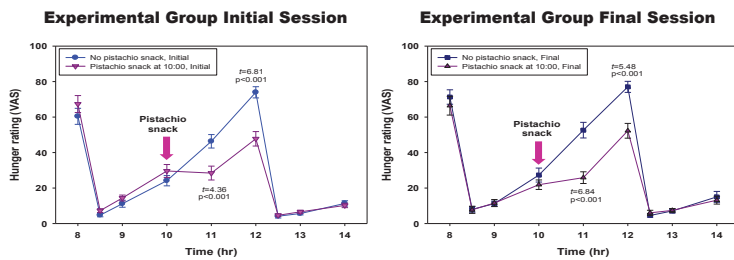
## METHOD

Body weight, DEXA body composition, various body perimeters and ad libitum food intake of 60 healthy adult women, initially not habitual consumers of nuts were measured during 4 experimental sessions. Two of the sessions were two consecutive days, before and after daily intake of pistachios (44 g = 250 kcal) for 12 weeks.

## RESULTS

**Regular consumption of pistachios did not result in weight gain or change in body composition.**

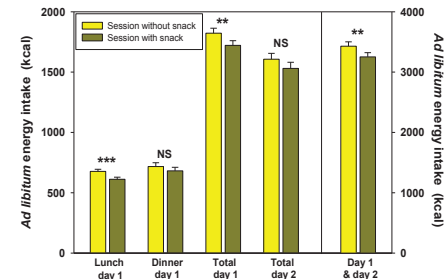
### Reduction of hunger sensations and desire to eat after the pistachio snack (VAS)



Increase of gastric fullness ratings resulted in a decrease of desire to eat in the pistachio snack group.

### Reduction of food intake after consumption of pistachio snack ad libitum

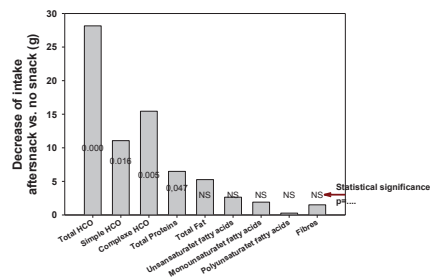
Mean ad libitum energy intake at different intake moments after pooling initial and final measurements of both groups (per protocol population, n=57).



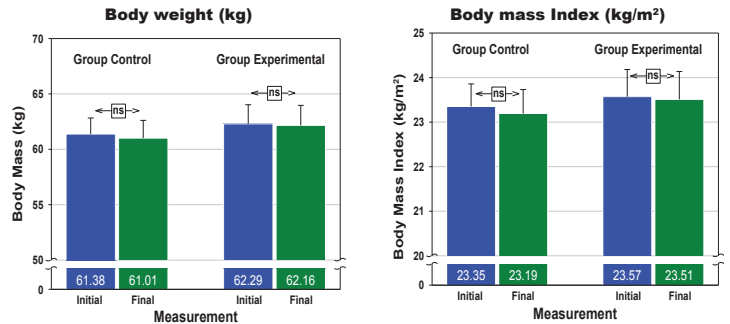
### Compensation of energy intake after the pistachio snack was by a reduction of carbohydrate intake...

As shown in the chart, the decrease in energy intake after experimental snacks mainly resulted from a significant decrease in total carbohydrate intake (and its components, complex carbohydrates and sugars) and to a lesser degree from a decrease in protein intake. In contrast, the small decreases in total fat or various fatty acids were not significant.

### Decrease in macronutrient intake with snacks versus sessions



### Resulting in a lack of weight or BMI change after the 12 week snack intervention



## CONCLUSION

Women who consumed a daily 44g pistachio snack improved their nutritional intake and compensated for the snack by decreasing their intake of other foods, including foods high in refined carbohydrates due to the satiety induced by the pistachios. There was no change in weight or BMI after consuming pistachios for 12 weeks.