



# Egg Replacements In Vegan Cookies



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## Hypotheses

- Null Hypothesis: Flaxseed is not the best overall scored egg replacement for the vegan egg free chocolate chip cookies.
- Alternative Hypothesis: Flaxseed is the best overall scoring egg replacement for vegan, egg-free chocolate chip cookies.

## Introduction

### Vegan Diet Information

- Veganism: form of a vegetarian diet that allows no eggs, milk and dairy ingredients, honey, gelatin, animal fats and shortenings, or any animal-based ingredients.
- On average vegan diets emit 35-50% lower greenhouse gas production than omnivore diets
- Health benefits such as lowering the risk of cardiovascular disease, type II diabetes, and reducing risk of cancer.
- Eggs are often difficult to substitute in baking since they provide emulsification, coagulation, foaming, and flavor properties.
- Promising egg replacements are flaxseeds, chai seeds, bananas, and applesauce

## Methods and Materials

**Materials:** Electric mixer, 2 large mixing bowls, 4 small bowls, dry mixing cups, liquid measuring cup measuring spoons, 1 oz. portion scoop #30, baking sheet, parchment paper, cooling racks, oven

### Setting and Trial:

- All trials at Fontbonne University in a FCS lab. 11 Subjects to evaluate cookies, 11 FCS students.
- Researchers used a basic butter-free recipe with eggs as the control group recipe and replaced the eggs in the recipe with varying egg replacements.
- Trial four was a flax seed egg cookie with coconut oil, flax seed egg cookie with vegetable oil, banana cookie with coconut oil, and a banana cookie with vegetable oil. Banana cookies cooked at 375 degrees Fahrenheit for 8 minutes and flax seed eggs cooked at same temp.
- For the flaxseed recipe, each egg included in the recipe was replaced with 1 tablespoon of flaxseed powder and 4 tablespoons of water. For the banana recipe, each egg was replaced with 1 ripe mashed-up banana.

### Nutrition Analysis

- Food Processor

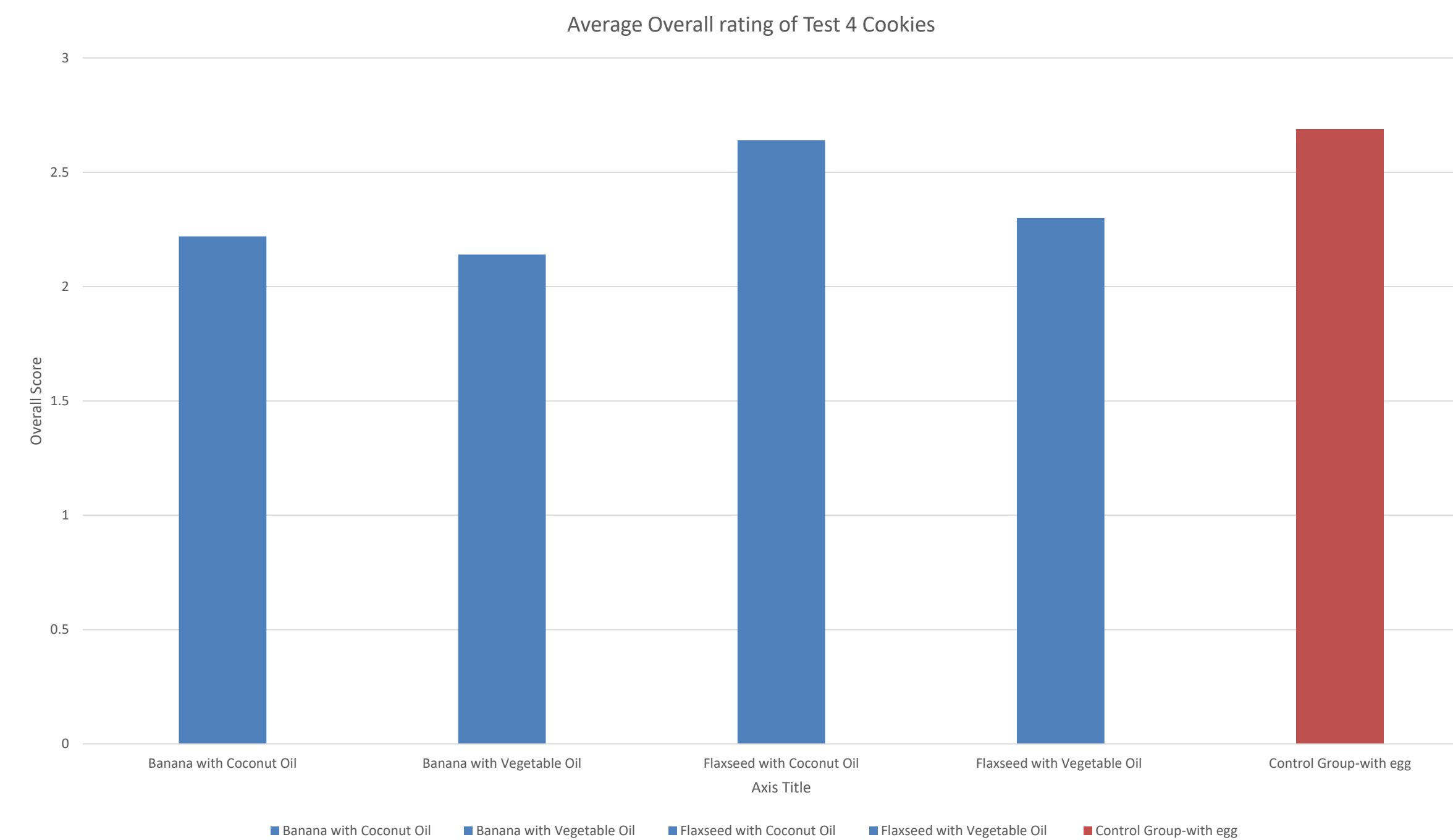
## Results

In recipe testing one the control cookie had an overall score of 2.69 out of 3. The banana cookies scored a 2.13 and the flax seed cookies scored a 1.17. During recipe testing two the control cookie scored a 2.02, the banana cookie scored a 2.48 and the flax seed egg cookie scored a 1.56. In recipe testing three the applesauce cookie scored a 2.26, banana cookie scored a 2.6, and the flax seed egg cookie scored a 2.13. In recipe testing 4 the flax seed egg with coconut oil cookie scored a 2.7, the flax seed egg with vegetable oil scored a 2.52, the banana cookie with coconut oil scored a 1.92, and the banana cookie with vegetable oil scored a 1.92.

## Conclusions

- Hypotheses was supported that vegan chocolate chip flaxseed cookies cooked with coconut oil received an overall enjoyment score most like the control cookie.
- The control cookie scored 2.69 and the flaxseed cookie cooked with coconut oil scored 2.64.

## Average Score Trial 4



	T1 C	T4 B Co	T4 B V	T4 FlaxCo	T4 Flax V
Exterior Color	2.88	2.1	2.1	2.6	2.5
Interior Color	2.57	2.1	2.6	2.5	1.7
Sweetness	2.75	2.5	2.1	2.7	2.4
Texture	2.88	2.5	2	2.7	2.4
Overall	2.77	1.92	1.92	2.7	2.52
Average	2.69	2.22	2.14	2.64	2.30

## Further Research

- Further researcher could be done on different egg replacements.
- Lentil protein and chai seeds have reported potential to be good egg replacement.
- Further research should be done to find the best flax seed to water amount in flaxseed cookies, researchers found 4 Tbs of water to 1 TBS of flaxseed to be the best.
- Further research could also be done on the best cooking times for specific egg replacements.
- Adjusting the amount of banana to lessen the flavor, since this was a common low score for the banana cookies

## Contact

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## References

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