Nutritional Intervention with Commercial Plant Proteins: Health Effects on Glucose and Lipid Metabolism in Healthy Subjects

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FOOD CHEMISTRY

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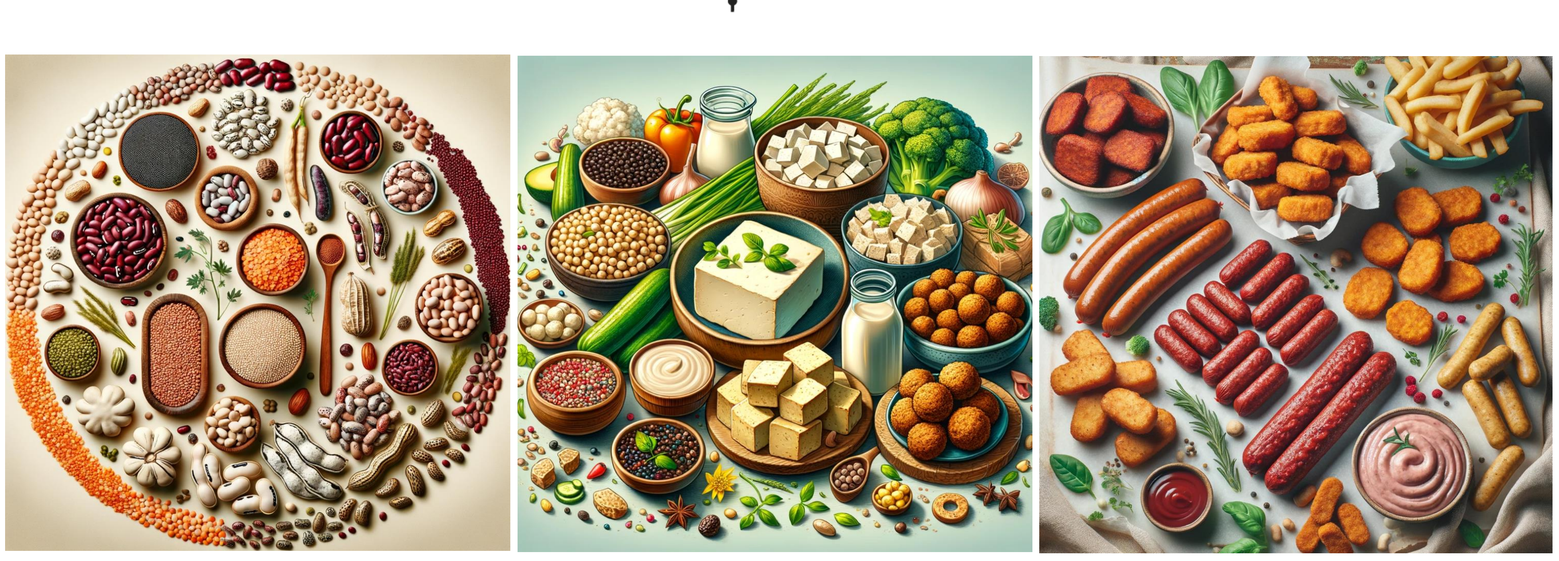
Introduction

The consumption of plant-based protein products has increased in recent years, leading to a continuous influx of new, protein-rich food items made entirely from plant-based ingredients into the market.

However, there is only a limited amount of scientific information available on the effects of differently processed plant-based foods on human health, which underscores the importance of researching the health effects of commercial plant protein product.

Aim of the research is to find out how commercial sources of plant proteins with different degrees of processing affect the concentrations of clinical markers in the blood.



Diet 1. Whole Plant-based Products (Legumes)

Diet 2. Mildly Processed Plant Proteins (Tofu, Falafel, Härkis…)

Diet 3. Refined Plant-based Products (Vegan sausages, Nuggets, Burger patties...)

***Figure 1**. Intervention diets 1-3 illustrated with AI (DALL-E 3).*

Materials and Methods

The effects of plant-based protein sources on human health were investigated using **a crossover study design in a five-week nutritional intervention.** Each diet lasted for a week, with a washout week in between to normalize the state. The intervention diets consisted of foods from **three different processing categories** (Fig 1). Order of the diets were randomized.

Participants aged 18–65 with a BMI between 18.5 and 27.0 kg/m2 were included. Exclusion criteria comprised e.g. pregnancy, regular medication, recent antibiotic use, and adherence to a certain diet. Eligibility was also based on initial blood sample results. A total of **36 study participants** were included.

The effects of the intervention diets on participants' **glucose and lipid metabolism** were analyzed using **fasting blood samples**. Samples were collected before and after each intervention week.

The results were analyzed using **statistical methods**. The impact of diets was examined using paired t-tests or Wilcoxon tests.

The **research hypothesis** was that unprocessed and lightly processed foods would induce a better response in participants' blood compared to refined plant-based products.

Results

Each of the investigated intervention diets (diet 1-3) positively affected the participants' values in terms **of total cholesterol**, **LDL cholesterol**, and the **HDL/total cholesterol ratio** (Fig 2).

Additionally, the third intervention diet (diet 3), which included refined plant-based products, lowered the participants' blood **triglyceride levels**. The intervention did not show a statistically significant effect on markers of **glucose metabolism.**

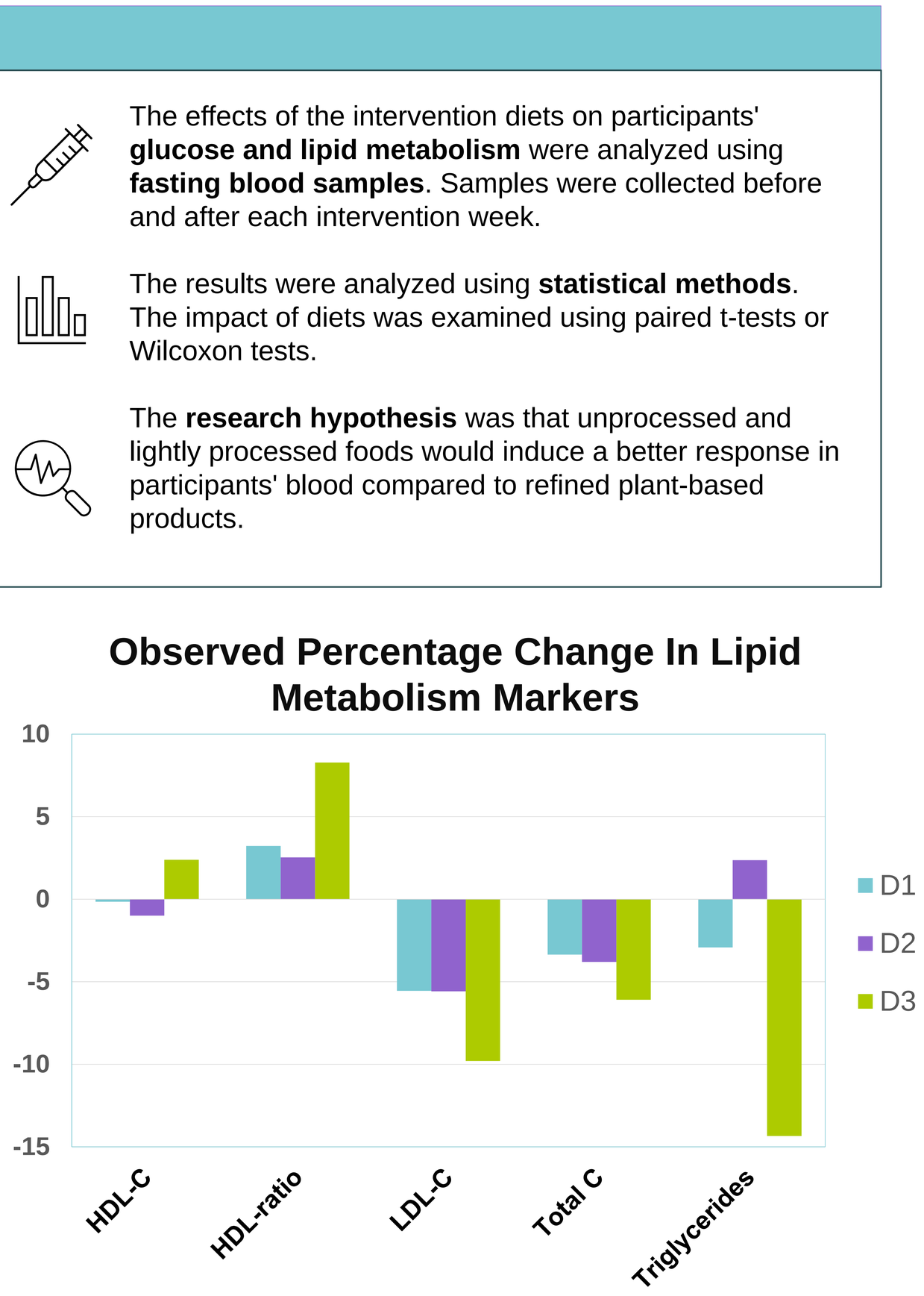


***Figure 2.** Observed change in lipid metabolism markers. All except HDL-C showed statistically significant changes during diets 1-3.*

Discussion and Conclusion

These results indicate **that each of the investigated diets lowers the concentration of lipid metabolism markers** in the plasma of healthy subjects.

Processing was not found to have a negative impact on these markers; on the contrary**, more refined products had the most positive effects** on blood lipid metabolism markers.