

Determination of serum inflammatory markers in response to a plant-based protein dietary intervention

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FOOD CHEMISTRY

1 Introduction

As the popularity for plant-based diets has increased, so has the interest in their modification and processing. In particular, what possible side effects could they have, and how are they linked to health. This randomized cross-over study aims to examine whether a short-term consumption of plant based foods with three different processing levels have notable effects on measured inflammatory markers. Inflammatory markers of interest are interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α) and high sensitivity C-reactive protein (hs-CRP). Hypothesis is, that more processed foods could potentially increase the inflammatory marker levels.

2 Materials and Methods

Inclusion criteria

- 18-65 years old
- BMI 18.5-27
- Healthy
- Willing to participate

Exclusion criteria

- Active smoker
- Gluten-free or vegan diet
- Antibiotic consumption during the past 6 months
- Chronic disease with continuous medication
- Pregnancy, lactation
- Abnormal liver, thyroid or kidney function, low hemoglobin

Quantitative assesment of serum IL-6 and TNF- α was performed with high sensitivity enzyme linked immunosorbent assay (ELISA). The results were compared with hs-CRP values, provided by TYKSLab.

Dietary intervention



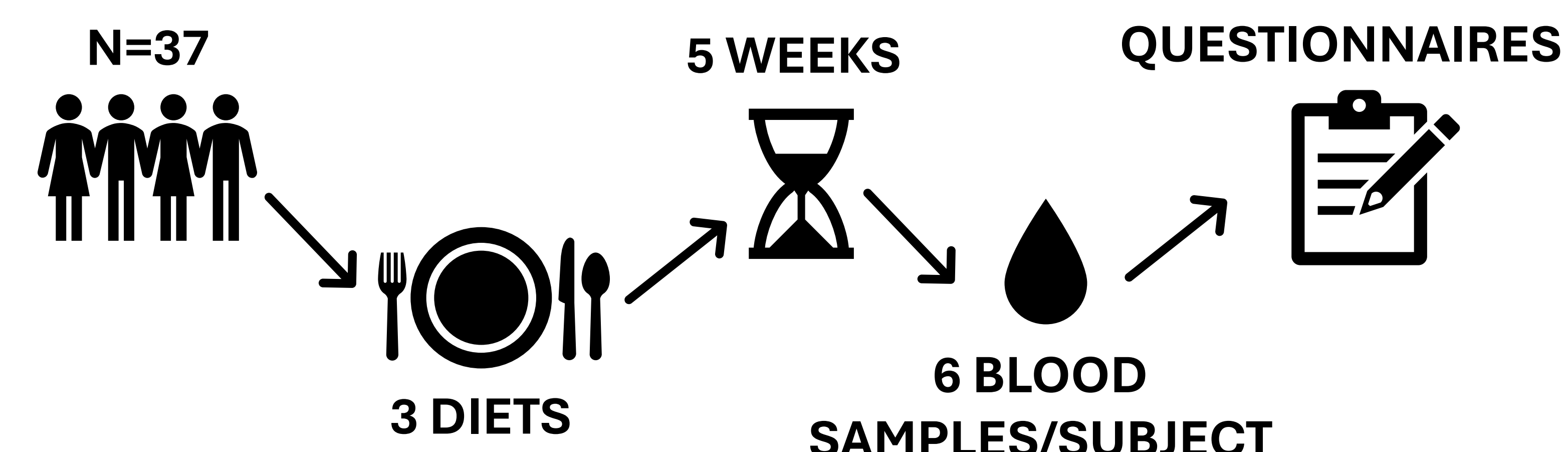
Diet 1: Whole plant-based products



Diet 2: Mildly processed plant-based products



Diet 3: Refined plant-based products



3 Results

The concentration of hs-CRP **decreased** on average by 0.71 mg/l (56 %) during diet 2.

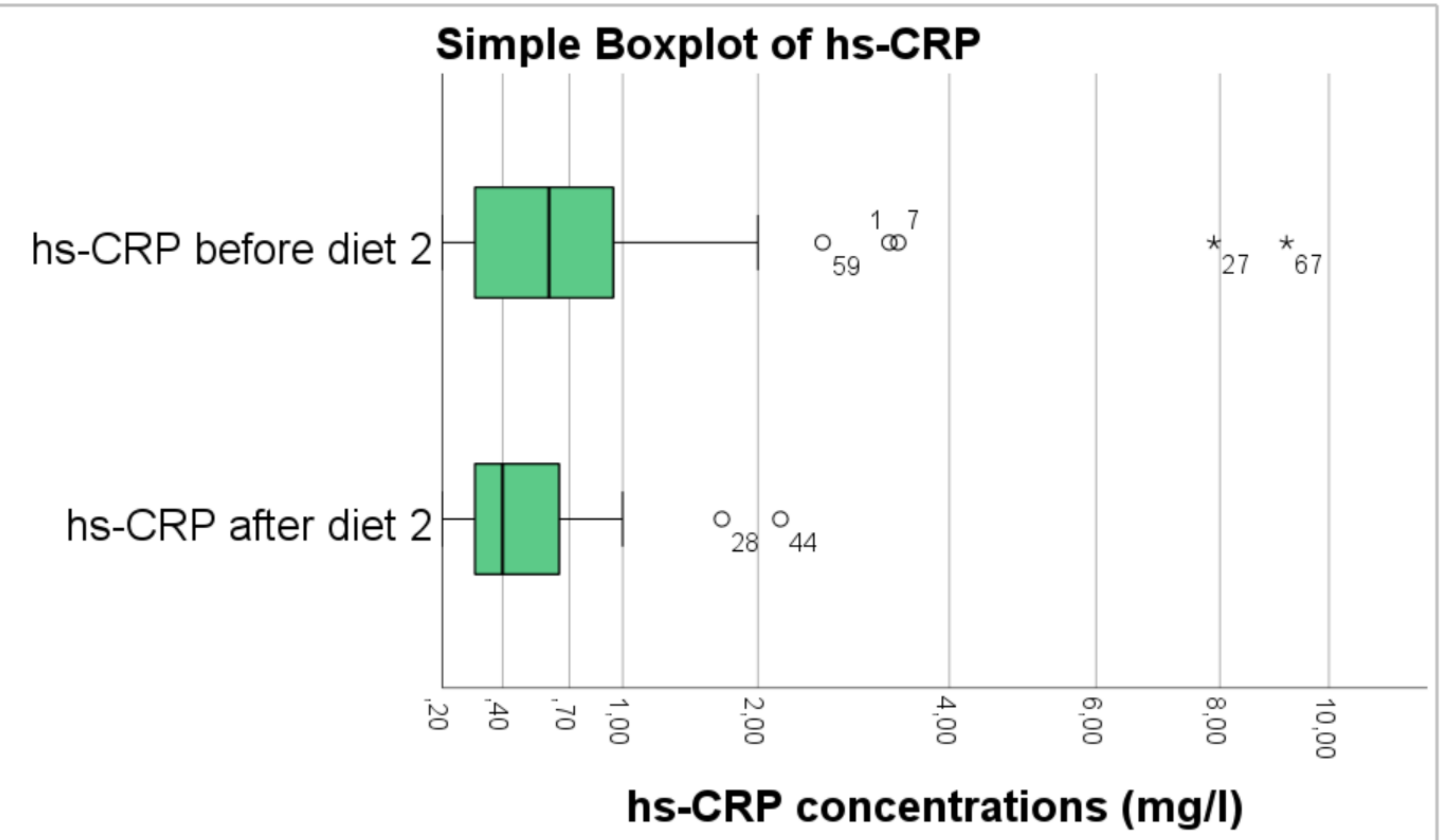


Figure 1. Observed change in hs-CRP concentration between diet 2 and it's baseline values.

The concentration of TNF- α **increased** on average by 0.20 pg/ml (25 %) during diet 2.

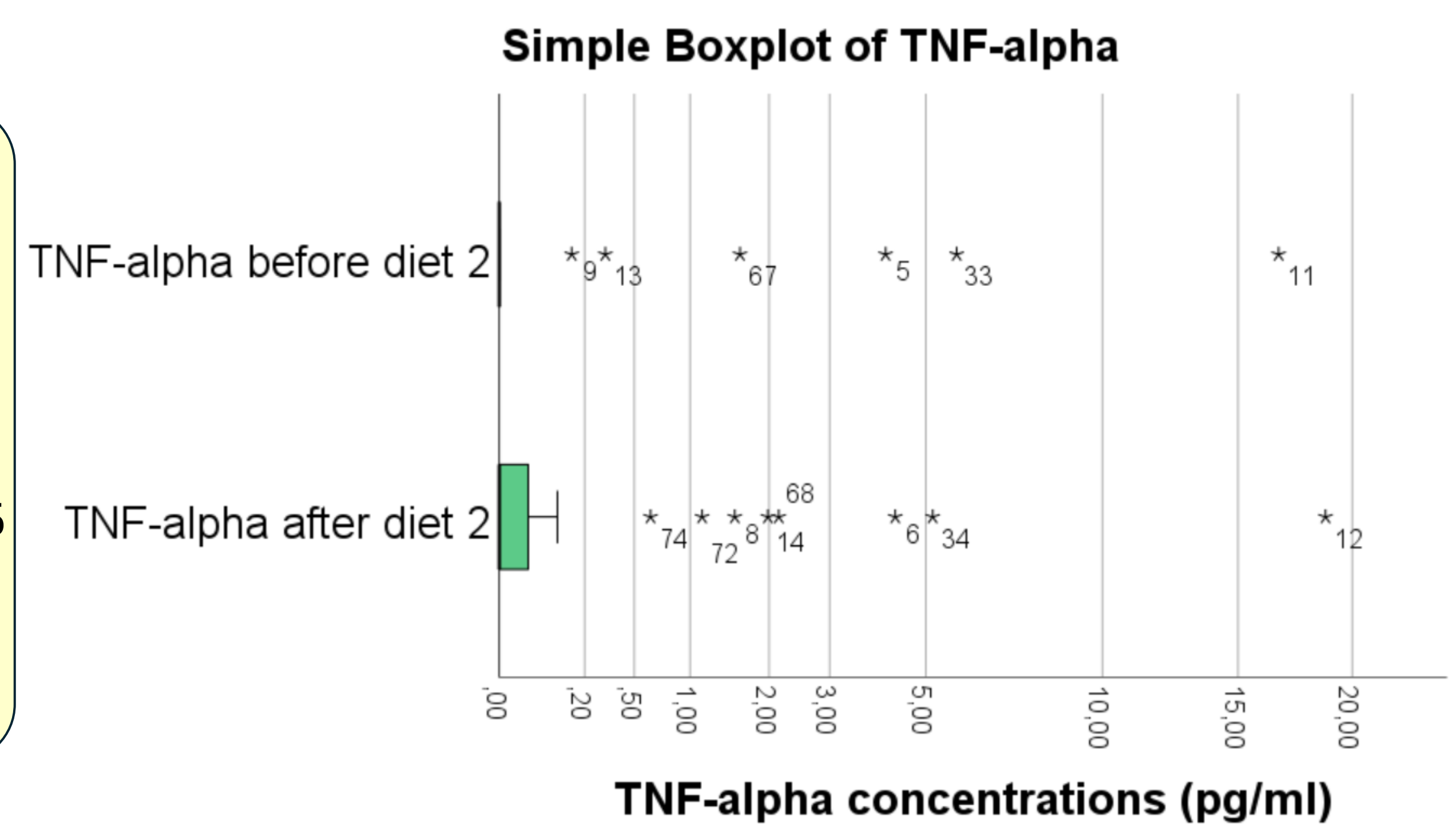


Figure 2. Observed change in TNF- α concentration between diet 2 and it's baseline values.

Moderately strong positive correlation between hs-CRP and IL-6 on diet 2, and between IL-6 and TNF- α on diet 3.

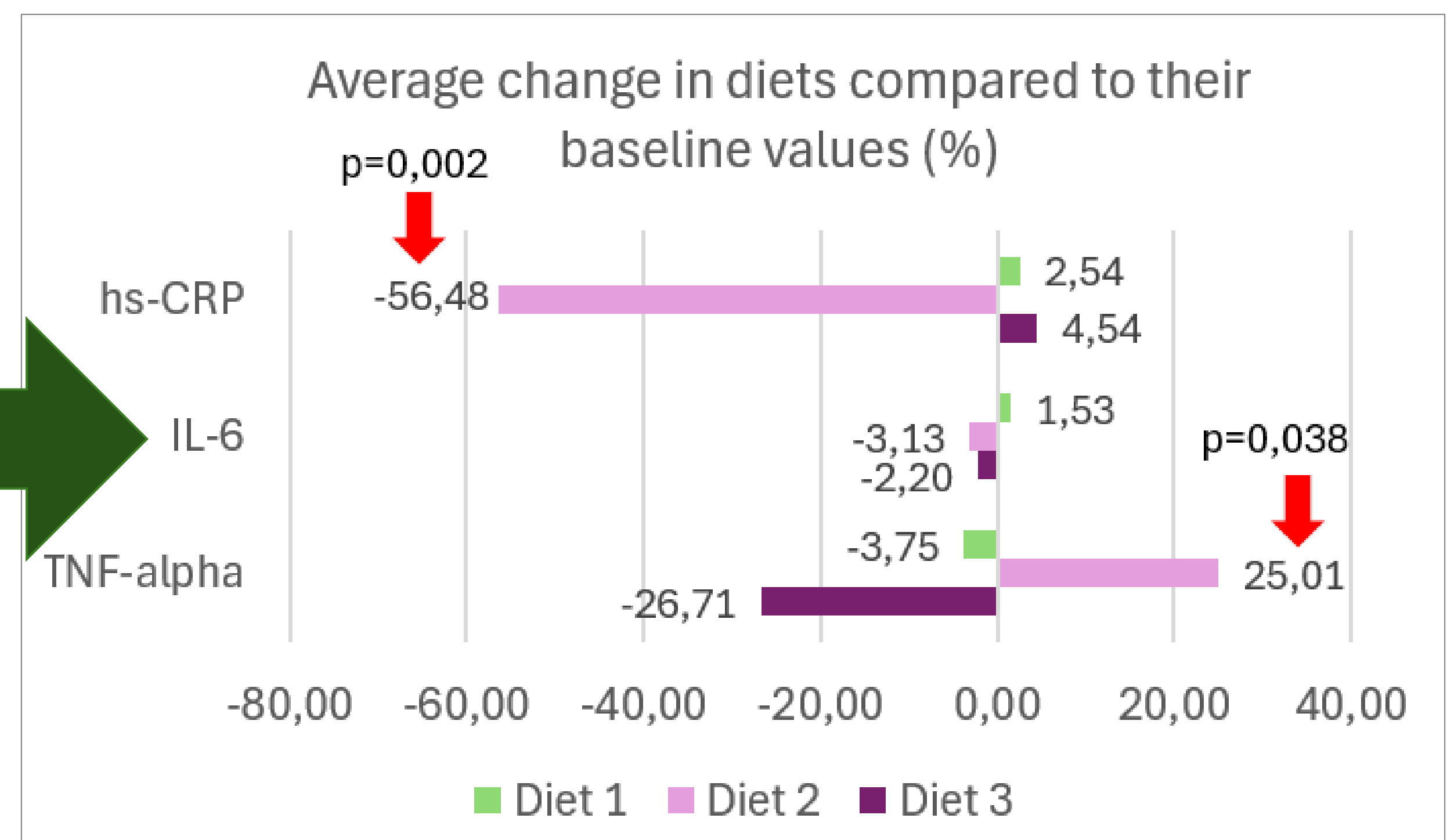


Figure 3. Observed change in inflammatory marker values of hs-CRP, IL-6 and TNF- α during the three different diets.

4 Conclusions

Comparing the three different diets did not have a statistically significant effect on inflammatory marker values. Hypothesis was not proven because the diets that increased inflammation levels varied. Nevertheless, diet 2 caused a statistically significant increase and decrease in inflammation levels. More detailed information about how a diet affects inflammatory markers would require more research.