Effects of an Encapsulated Fruit and Vegetable Juice Concentrate on Obesity-Induced Systemic Inflammation: A Randomised Controlled Trial

Williams EJ, Baines KJ, Berthon BS, Wood LG. Effects of an Encapsulated Fruit and Vegetable Juice Concentrate on Obesity-Induced Systemic Inflammation: A Randomised Controlled Trial. Nutrients. 2017 Feb 8;9(2):116. doi: 10.3390/nu9020116. PMID: 28208713; PMCID: PMC5331547.

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BACKGROUND

- Obesity is one of the main public health concerns in the developed world
  - 35 % of the U.S. population is categorized as obese
- Obesity is characterized by chronic low-grade systemic inflammation
- Overweight and obesity are associated with several chronic diseases including:
  - Type 2 diabetes mellitus, Cardiovascular disease, Stroke, Hypertension etc.

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AIM

To evaluate the effects of an encapsulated fruit, vegetable and berry juice concentrate on systemic inflammation and other risk factors for chronic disease in overweight and obese individuals

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METHODS

- Double blind, parallel, randomized, placebo-controlled trial
- 56 adults ≥ 40 years, BMI ≥ 28 kg/m2, non-smokers
- Adherence to a low fruit & vegetable diet (≤ 3 servings/day of fruit and vegetables combined) 2 weeks before the start and for the entire duration of the study
- Supplementation with an encapsulated fruit, vegetable and berry juice powder concentrate (Juice Plus+) or placebo for 8 weeks
- Inflammation markers, blood lipids & body composition measured at baseline and end of study
- Analysis of the full cohort + subgroup analysis of subjects with a high inflammatory status

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MAIN RESULTS – FULL COHORT

After 8 weeks of supplementation:

- Plasma beta-carotene and total carotenoids increased significantly in the FVB group compared to baseline and placebo
- Total cholesterol and LDL cholesterol were significantly decreased in the FVB group
  - 3.5 % reduction in total cholesterol (estimated to be equivalent to a weight loss of 4 kg and 8-9 % CVD risk reduction)
  - 3.5 % decrease in LDL cholesterol (estimated to be equivalent to a 6.5 kg weight loss and 5 % CVD risk reduction)
- Plasma levels of TNF-alpha significantly decreased within the FVB group compared to baseline and almost reached significance when compared to placebo
- Total lean body mass increased significantly in the FVB group compared to placebo group
- Weight, BMI and waist circumference did not change in either group

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MAIN RESULTS – SUBGROUP

Analysis of high inflammatory status subgroup (16 adults) with a baseline CRP ≥ 3.0 mg/mL

After 8 weeks of supplementation:

- Plasma beta-carotene and total carotenoids increased significantly in the intervention subgroup compared to baseline and placebo
- Total cholesterol and LDL cholesterol were significantly decreased in the FVB group
  - 7.4 % reduction in total cholesterol
    (estimated to be equivalent to a weight loss of 9 kg and 18-19 % CVD risk reduction)
  - 4 % decrease in LDL cholesterol
    (estimated to be equivalent to a weight loss of 8 kg and 4% CVD risk reduction)
- Plasma levels of TNF-alpha significantly decreased in the FVB subgroup compared to baseline and placebo
- sTNFR1 and sTNFR2 significantly decreased in the FVB subgroup compared to placebo
- Total lean body mass increased significantly in the FVB subgroup compared to placebo
- Weight, BMI and waist circumference did not change in either group

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CONCLUSION

This trial in 40+ years old individuals shows that FVB concentrate supplementation has the potential to improve the metabolic profile of overweight and obese individuals by reducing blood lipid levels and systemic inflammation, as well as improving body composition.

Article available: https://pubmed.ncbi.nlm.nih.gov/28208713/

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