

Implications of antioxidants in diet on health

How does consumption of dietary antioxidants affect plasma antioxidant capacity?

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Aims

- To find out how consuming specific antioxidants affects plasma antioxidant capacity
- To determine if vitamin C and epicatechin have an equal or different effect on changes of antioxidant capacity

Introduction/Background

- ~ The benefits of antioxidants are well hyped in the media, and the food and supplement industries.
- ~ These claims are mainly based on the theory that consuming more dietary antioxidants will reduce more free radicals (cell damaging substances) in the body.
- ~ The present study modifies a previous study (Trust me, I'm a Doctor) that used smoothies, by adding a control treatment and using vitamin C and epicatechin as separate antioxidant treatments.

Methods



Figure 1 Flow diagram of study

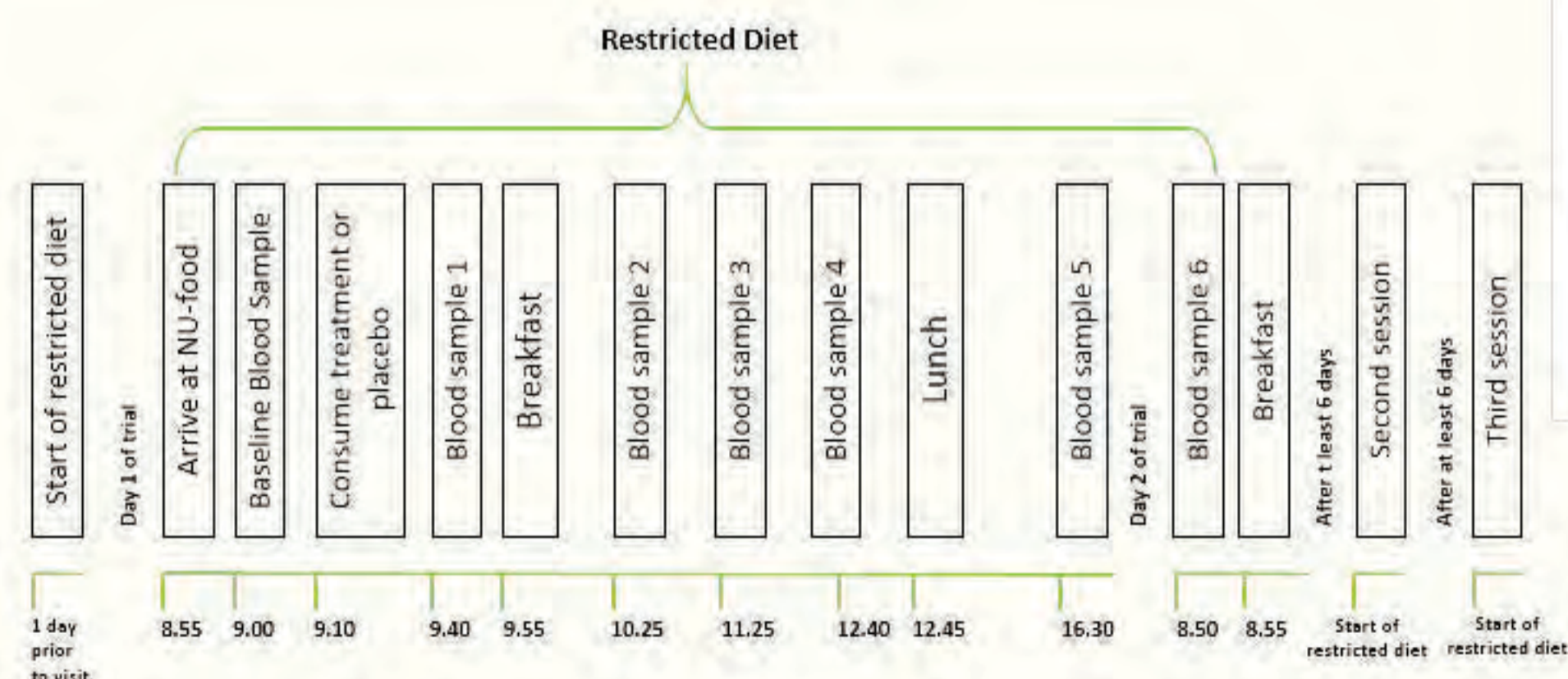


Figure 2 Timeline as followed by volunteers

Results

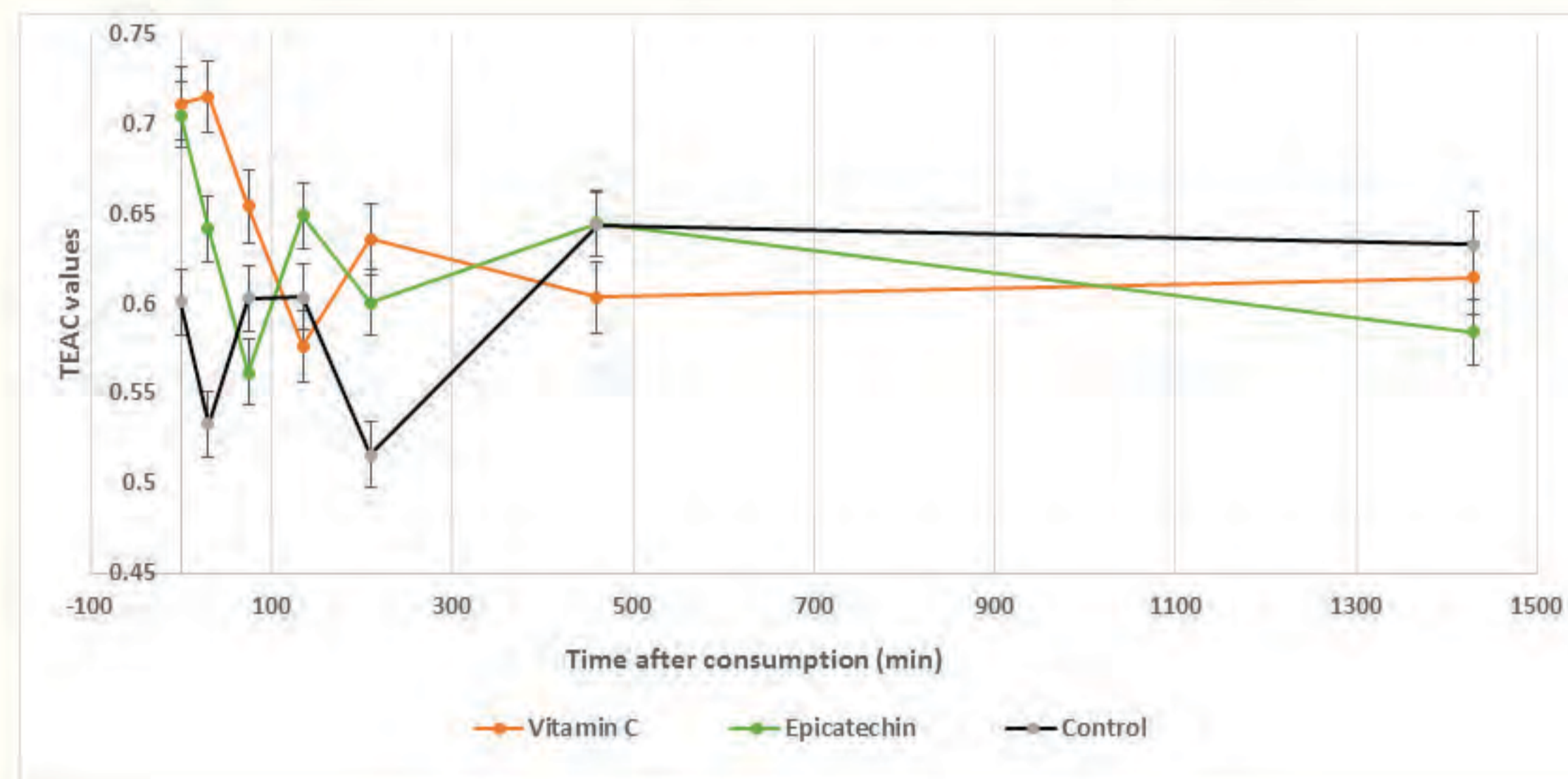


Figure 3 Plasma antioxidant capacity after consumption of Vitamin C, Epicatechin and control. Data as mean \pm s.e.m., $P < 0.05$. There is no overall significant difference following the consumption of vitamin C and epicatechin compared with the control as seen in Table 1.

Table 1: P-values of plasma antioxidant capacity of antioxidant containing drinks against control.

Time point (min)	0	30	75	135	210	460	1430
Vitamin C	0.041	0.048	0.431	0.649	0.023	0.546	0.798
Epicatechin	0.095	0.131	0.524	0.343	0.094	0.990	0.471

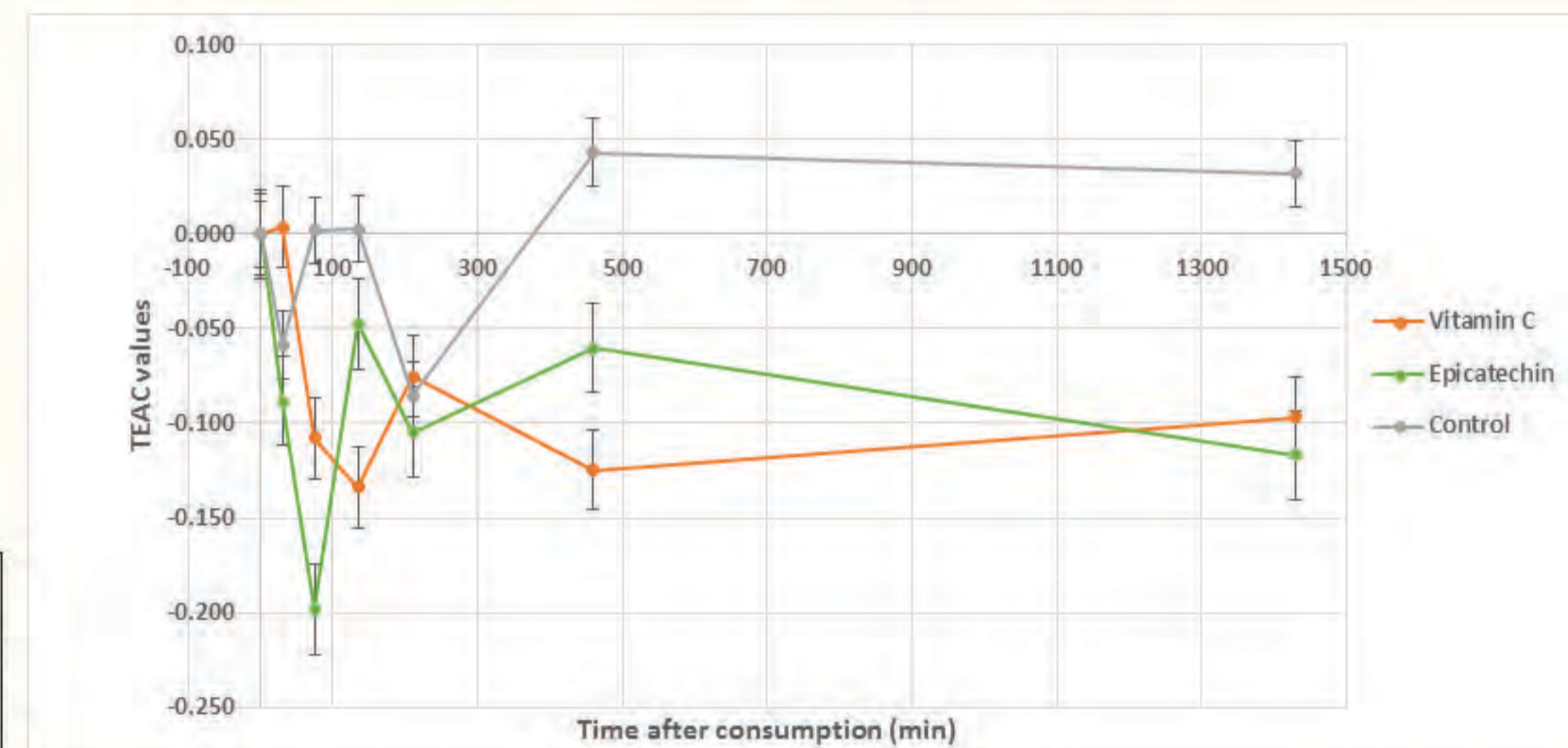


Figure 4 Change in plasma antioxidant capacity after consumption of Vitamin C, Epicatechin and control. Data as mean \pm s.e.m., $P < 0.05$. There is no significant difference between the 2 treatments at any time after consumption as seen in Table 2.

Table 2: P-values of change in plasma antioxidant capacity of Vitamin C against Epicatechin

Time point (min)	30	75	135	210	460	1430
p-value	0.163553	0.218814	0.557061	0.441172	0.964828	0.524406

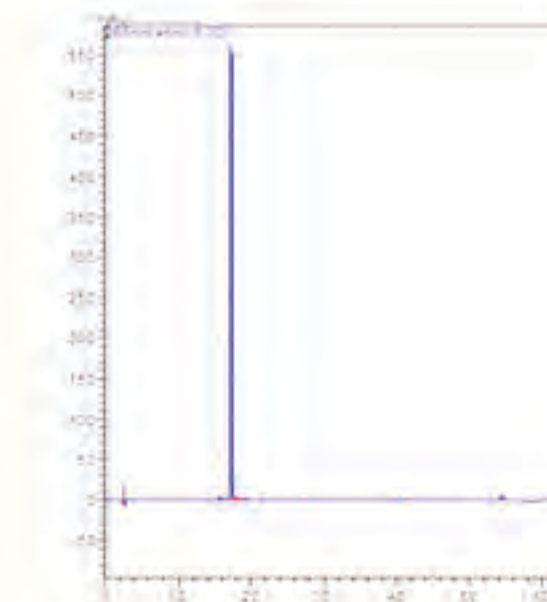


Figure 5 HPLC imagery showing peak that indicates presence of epicatechin in treatment sample

Discussion

- The results indicate that the treatments appear to have no effect on plasma antioxidant capacity (PAC).
- The two treatments also do not appear to have any differing effect on PAC.
- Results from the previous smoothie study (Trust me, I'm a Doctor) appeared to show that the body returned antioxidants levels to ideal by homeostasis. However, lack of a control drink to compare against means that it is not known if antioxidants levels decreased in relation to if the volunteers had not drunk a smoothie.
- Improvement: Prepare the volunteers' evening meal as well to have more control over what volunteers consume during the study.
- The results from this study contradict other studies which show that PAC rises after consumption of vitamin C (Cao et al., 2017, Mikirova et al., 2007) and challenges the common belief based on Harman's theory of ageing that more dietary antioxidants means higher PAC.
- This is not to say consuming fruits and vegetables is pointless as there is strong evidence that these foods have many proven health benefits and protective effects against various diseases. (Van Duyn and Pivonka, 2000)

Conclusion

The consumption of a vitamin C and an epicatechin drink does not appear to have any effect on the plasma antioxidant capacity of volunteers. Due to many contradicts in literature on this topic, there is still need for further studies to be carried out.

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