Can intake of table egg reduce your blood cholesterol?  
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Summary

- Foods are prepared and digested, and then absorbed.
- Simulated digestion of egg increased in vitro bile acid binding activity and reduced cholesterol solubility in micelles.
- Whole eggs, especially egg yolk hydrolysates, showed the highest hypocholesterolemic activity between all samples.
- Our study suggested that hydrolyzed products of eggs generated in the gut might interfere with cholesterol solubilization and thus reduce cholesterol absorption.

Problem

- Hypercholesterolemia- elevated low density cholesterol levels in plasma- is considered as one of the major risk factors for cardiovascular disease, which is the leading cause of morbidity and mortality worldwide.
- Although eggs are considered as a perfect food there is public concern over egg consumption due to the presence of cholesterol in egg yolk, however there’s no established direct relationship between cholesterol intake and heart disease.
- As a water insoluble component, a critically important step in cholesterol absorption is the formation of micellar structure with dietary cholesterol. Bile acids play an essential role in this process.

Figure 1. Intestinal cholesterol absorption. (Davis & Altmann, Biochimica et Biophysica Acta 1791, 2009).

- Any compound capable of binding bile acids will make bile acids unavailable for the formation of micelles and thus cholesterol will be excreted from the body as feces.
- To maintain homeostasis, the body will synthesize bile acids in the liver and thus reduce cholesterol content in the body.

The specific objective was to study how simulated digestion would affect cholesterol absorption through in vitro bile acid binding and change in cholesterol micellar solubility.

Figure 2. Sodium deoxycholate binding of egg samples and their hydrolysates.

P: pepsin digested; PP: pepsin and pancreatin digested; F: fried; B: boiled; EW: egg white; EY: egg yolk; WE: whole egg.

Importance and significance

- The results of the present study clearly revealed the potential of egg hydrolysates in reduction of cholesterol absorption in vitro. Bile acids help solubility of cholesterol in micelles which is the primary mechanism for cholesterol absorption.
- Egg yolk seemed to be the major component of egg to reduce the cholesterol micellar solubility and binding of bile acid.
- These results showed hypocholesterolemic effects of egg yolk hydrolysates despite of the common viewpoint on side effects of consumption of eggs because of the cholesterol issue.
- This important finding can help a better understanding of egg value in maintaining health and wellness in human which can further increase the applications of eggs in different industries.

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