



# 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.

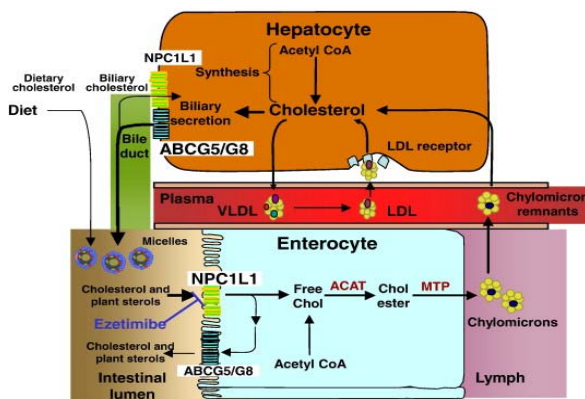
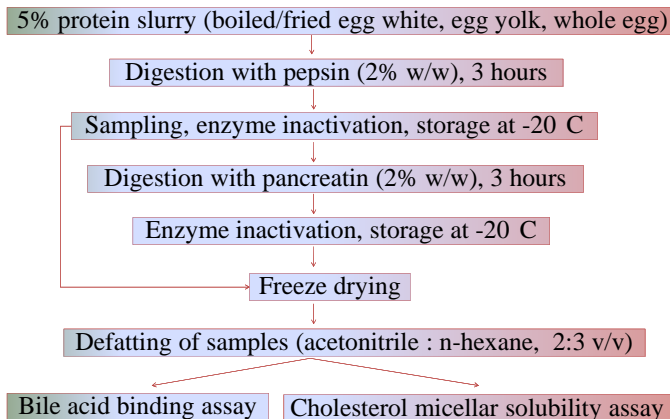


Figure 1. Intestinal cholesterol absorption. (Davis & Altmann, Biochimica et Biophysica Acta 1791, 2009).

- ✓ 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.

## Experimental design



## Our Observations

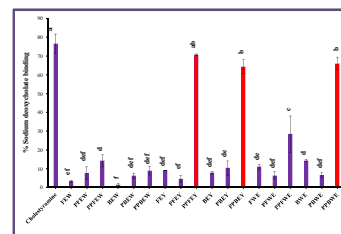


Figure 2. Sodium deoxycholate binding of egg samples and their hydrolysates.

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

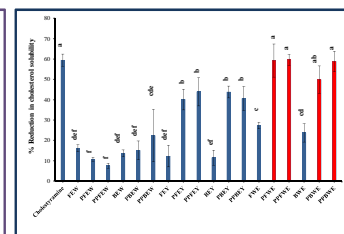


Figure 3. % Reduction of cholesterol solubility by egg samples and their hydrolysates.

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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