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In-vitro study of milk protein on Angiotensin converting enzyme activity

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Angiotensin II is involved in blood pressure, blood volume, and blood electrolyte homeostasis. Some of the drugs that are currently used to control hypertension such as captopril, enalapril are inhibitors of Angiotensin Converting Enzyme (ACE). Peptides formed from milk proteins have an inhibitory effect on ACE. An *in-vitro* study was carried out to assess the effect of locally produced low fat sterilised milk and low fat curd. 5ml of de-ionised water was added to 5g of milk and curd and the pH was adjusted to 3.72 using lactic acid and centrifuged at 10,000 g for 10 minutes. The fat on the top layer was removed and the pH was readjusted to 8.3 with 10 N NaOH, the optimum pH for the reaction. Another 5g of curd and milk were digested overnight with 4ml of 25% (w/v) pepsin at pH 1.5 followed by 1 ml of trypsin at pH 7.8 so that the total volume would be maintained constant. After complete digestion, the pH was adjusted to 8.3 using 10 N NaOH and centrifuged at 10,000 g for 10 minutes. 0.08 ml of the above samples was used as the substrate for analysis.

The ACE inhibitory activity was carried out using the modified version of Cushman and Cheung. 0.3% (w/V) Hippuryl-L-Histidyl-L-Leucine as the buffer and ACE of Sigma products were used. Absorbance of the product formed was measured at 228 nm using suitable cuvettes. The substrate free buffer was considered to have 100 % activity and the blank as 0% activity. The digested curd had the maximum inhibitory activity of 78.98 %, curd had 49.41%, digested milk had 48.09 % and milk had 3.99 %.

The highest inhibition of digested curd may be due to competitive inhibition of the enzyme ACE by peptides produced from curd both by the bacteria and digestive peptidases. A small inhibition by milk may due to the fewer amounts of peptides present in it. The curd has an inhibitory effect on ACE. The inhibitory effect is increased with digestion. The digested milk also had an inhibitory effect slightly less than curd.

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