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Angiotensin-converting enzyme inhibitory effects of dairy- and soy-derived peptides in pre-hypertensive overweight men and women

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ABSTRACT:

Background: Hypertension is considered the most prevalent cardiovascular disorder and a significant public health problem. A functional food that could potentially impede progression into a hypertensive state in pre-hypertensive individuals is of significant interest to clinicians and consumers. *In vitro* and animal studies suggest the presence of potential ACE inhibitory dairy- and soy-derived peptides. Very few human-based research studies have been conducted to investigate the blood pressure lowering and/or ACE-inhibitory effects of whey and soy protein hydrolysates in humans. This pilot study tested the acute effects of 20g doses of whey and soy hydrolysates in pre-hypertensive, overweight men and postmenopausal women on serum ACE activity and blood pressure.

Findings: Using a randomized crossover design, four initial subjects received five treatments (unhydrolyzed casein, whey protein isolate, whey protein hydrolysate, soy protein isolate, soy protein hydrolysate) at different testing visits separated by three-day washout periods. Blood pressure and blood draws to measure ACE activity were taken at thirty minute intervals following treatment consumption. Both the soy protein and whey protein hydrolysates had notable *in vitro* ACE-inhibitory activity, both before and after heat treatment. No differences were observed among the protein treatments for either ACE activity or systolic blood pressure.

Conclusions: The results of this pilot study support a discrepancy between *in vitro* and human-based *in vivo* ACE-inhibitory acute effects of whey and soy protein hydrolysates, underscoring the need for further research to better understand potential explanations for these findings.

Key Words: ACE (Angiotensin-converting enzyme), Casein, Soy, Whey, Protein, Blood pressure, Dairy, Bioactive, Peptides