

## The impact of whey protein and leucine on postprandial vascular function: findings from the Whey2Glo Study

D. Price<sup>1,2,3</sup>, Y. Chatzidiakou<sup>1,2,3</sup>, K.G. Jackson<sup>1,2,3</sup>, D.I. Givens<sup>2</sup> and J.A. Lovegrove<sup>1,2,3</sup>

<sup>1</sup>Hugh Sinclair Unit of Human Nutrition, Reading, UK,

<sup>2</sup>Institute of Food Nutrition and Health, University of Reading, Reading, UK and

<sup>3</sup>Institute of Cardiovascular and Metabolic Research, University of Reading, Reading, UK

Higher intakes of whey protein have been associated with improvements in blood pressure (BP), vascular function, and insulin sensitivity in those with moderately raised BP<sup>(1)</sup>. Upon digestion, whey protein releases a number of bioactive peptides, with those enriched in L-leucine suggested to mediate the cardioprotective effects<sup>(2)</sup>. The aim of the Whey2Glo study was to compare the acute effects of whey protein with wheat protein and determine whether the leucine content of the protein supplement plays an important role on vascular function in those with normal to moderately raised fasted glucose concentrations. The Whey2Glo study was a double-blind, placebo controlled, postprandial, crossover study. Healthy participants (n = 10, fasting glucose concentration 5.2 to 6.9mmol/L) were randomised to consume sequential high-fat test meals at breakfast (0 min) and lunch (330 min), each containing 25 g of either whey proteins isolate, partially hydrolysed wheat protein or partially hydrolysed wheat protein with added leucine (2.57 g per 100g) on 3 occasions, separated by at least 3 weeks. Measurements of blood pressure and vascular function were performed at fasting (baseline) and then at 120, 240, 360 and 480 minutes following the breakfast meal using an BP monitor and a Mobil-O-Graph device to determine BP and pulse wave velocity (PWV), respectively. Microvascular reactivity was assessed using laser Doppler imagining with iontophoresis. Postprandial time course profiles were analysed using 2-way repeated measures ANOVA, and the summary measures area (AUC) and incremental area under the curve (IAUC) were calculated and analysed using repeated-measures ANOVA. There was no significant effect of the protein treatment on the postprandial systolic BP (SBP) response ( $P = 0.056$ ), with a tendency for the whey protein isolate to reduce SBP compared to the partially hydrolysed wheat protein. There were no effects evident on postprandial diastolic BP or pulse pressure. There was a significant reduction in the AUC and IAUC for the postprandial PWV response after meals containing the partially hydrolysed wheat protein compared to the other protein treatments ( $P = 0.01$ ). There were no effects of the protein treatments found on microvascular reactivity in response to acetylcholine (endothelial-dependent vasodilator) or sodium nitroprusside (endothelial independent vasodilator). In conclusion, our findings suggest that L-leucine does not appear to have a beneficial effect on postprandial measures of vascular function in those with normal- or moderately elevated glycaemia, although further research is required to confirm these findings.

### References

1. Fekete AA, Givens DI, Lovegrove JA *et al.* (2016) *Proc Nutr Soc* **75**, 328–341.
2. Price D, Jackson KG, Lovegrove JA, *et al.* (2022) *Nutr Bul* **47**, 9–26.