

Protein hydrolysates and recovery of muscle damage following eccentric exercise

¹Dale M.J., ¹Thomson R.L., ¹Coates A.M., ^{1,2}Howe P.R.C., ³Brown A.,
^{1*}Buckley J.D.

¹Alliance for Research in Exercise, Nutrition and Activity (ARENA), Sansom Institute for Health Research and School of Health Sciences, University of South Australia, Adelaide, Australia; ²Clinical Nutrition Research Centre, University of Newcastle, Newcastle, Australia; ³Murray Goulburn Co-operative Co. Ltd, Melbourne, Australia

*Corresponding author: Professor Jonathan D Buckley, Alliance for Research in Exercise, Nutrition and Activity (ARENA), Sansom Institute for Health Research, University of South Australia, GPO Box 2471, Adelaide 5001, Australia

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ABSTRACT

Background: A whey protein hydrolysate (NatraBoost XR; WPH_{NB}) has been shown to speed repair muscle damage. We sought to determine whether this benefit is specific to this hydrolysate to evaluate a marker for quality control.

Methods: Three hydrolysates of the same whey protein isolate (WPI) were prepared (WPH_{NB}, WPH₁ and WPH₂). Isometric knee extensor strength was measured in 39 sedentary male participants before and after 100 maximal eccentric contractions of the knee extensors to induce muscle damage. Participants were then randomised to consume 250 ml of flavoured water (FW, n=9), or 250 ml of FW containing 25 g of either NatraBoost XR (n=3), WPH₁ (n=9), WPH₂ (n=9) or WPI (n=9). Strength was reassessed over the next seven days while the supplements were consumed daily. Fibroblasts were cultured for 48 hr in the presence of the different hydrolysates, WPI, saline or fetal bovine serum to ascertain effects on cell proliferation.

Results: Strength was reduced in all treatment groups after eccentric exercise (P<0.001). Strength recovered steadily over 7 days in the FW, WPI, WPH₁ and WPH₂ treatment groups (P<0.001), with no difference between treatments (P=0.87). WPH_{NB} promoted faster strength recovery compared with the other treatments (P<0.001). Fibroblast proliferation was greater with WPH_{NB} compared with saline, WPI or the other hydrolysates (P<0.001).

Conclusions: Promoting recovery from muscle damage seems unique to WPH_{NB}. *In vitro* fibroblast proliferation may be a useful marker for quality control. It is not clear whether effects on fibroblast proliferation contribute to the *in vivo* effect of WPH_{NB} on muscle damage.

Keywords: tissue repair, fibroblast proliferation, strength recovery, whey protein