

APPEARANCE OF PLASMA AMINO ACIDS FOLLOWING CONSUMPTION OF AN ORAL NUTRITION SUPPLEMENT

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BACKGROUND & OBJECTIVES

- Immunonutrients have been shown to reduce complications in patients following major elective surgery^{1,2}
- Formulas containing supplemental L-arginine, n-3 fatty acids, and dietary nucleotides appear to work synergistically to support improved outcomes^{1,2}
- No one has systematically evaluated if amino acids are absorbed similarly regardless of calorie and carbohydrate content
- An immunonutrient-containing oral nutrition supplement (ONS) was recently renovated to provide less carbohydrate and less calories in a smaller volume formula (see Table 1)
- The purpose of this study was to assess the effect of the renovated ONS on kinetics of amino acid absorption.
- Secondary objectives were to assess the effect of consumption on blood omega-3 fatty acids, glucose, and insulin levels
- The primary outcome variable was arginine area under the curve (AUC)

Table 1. Description of Products Used in Study

	ONS-r	ONS
Serving size	6 oz	8 oz
Calories	200	340
Protein (intact & L-arginine) (g)	18.1	18.1
L-arginine (g)	4.2	4.2
Nucleotides (mg)	430	430
Total fat (g)	7.9	9.2
MCT (g)	1.3	2.6
Total carbohydrate (g)	15	45
Sugar (g)	13	29.2
Fiber (g)	0	3.3

1. Braga M, Gianotti L, Vignali A, Carlo VD. Preoperative oral arginine and n-3 fatty acid supplementation improves the immunometabolic host response and outcome after colorectal resection for cancer. *Surgery*. Nov 2002;132(5):805-814. 2. Drover JW, Dhaliwal R, Weiser L, Wischmeyer PE, Ochoa JB, Heyland DK. Perioperative use of arginine-supplemented diets: a systematic review of the evidence. *J Am Coll Surg*. Mar 2011;212(3):385-399, 399 e381.

METHODS

- Randomized crossover trial in which healthy adults completed 2 treatment assignments in random order
- One serving of ONS (IMPACT Advanced Recovery[®]; 8 oz) or the renovated ONS (ONS-r, 6 oz) was consumed following an 8 hour fast Plasma amino acids; plasma-free and plasma total fatty acids, EPA, and DHA; glucose and insulin were measured pre-consumption and at 30, 60, 120, 180, and 240 minutes after consumption
- Plasma uric acid was measured at pre-consumption and 240 minutes after consumption
- Total area under the curve (AUC) was calculated and compared between the two formulas

RESULTS

- A total of 12 subjects [67% F, mean age 35.6 years (range 20-61 years)] completed the trial
- No significant difference between formulas for plasma arginine, total fatty acids, EPA, DHA, or uric acid AUCs or concentration at any time Mean glucose levels were significantly lower after consumption of ONS-r vs ONS at 30, 60, and 240 minutes ($p < 0.05$; see Figure 2)
- Mean insulin levels were significantly lower after consumption of ONS-r vs ONS at 30 minutes ($p = 0.035$; see Figure 3)

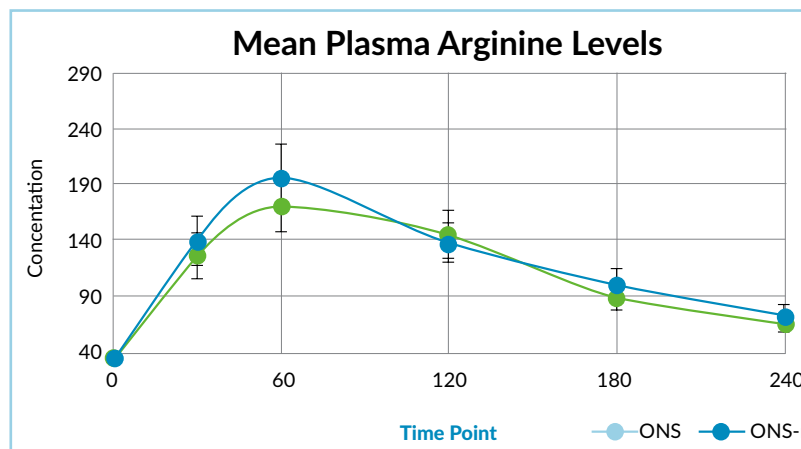


Figure 1. Mean Plasma Arginine Levels Between ONS and ONS-r

RESULTS

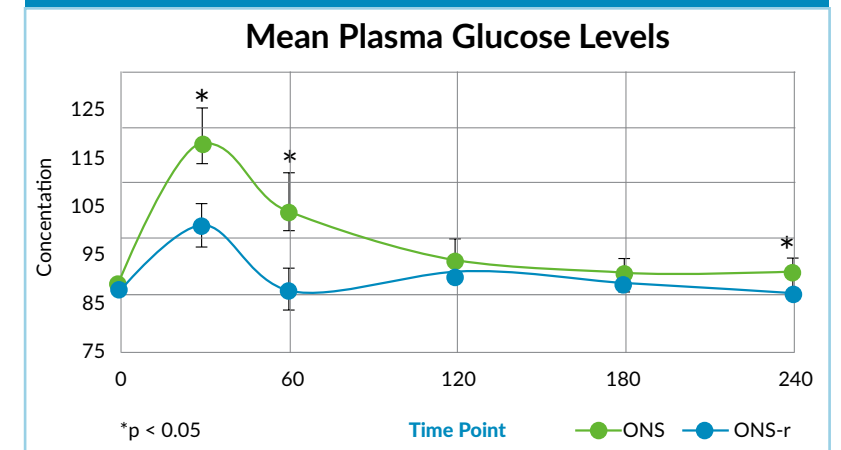


Figure 2. Mean Plasma Glucose Levels Between ONS and ONS-r

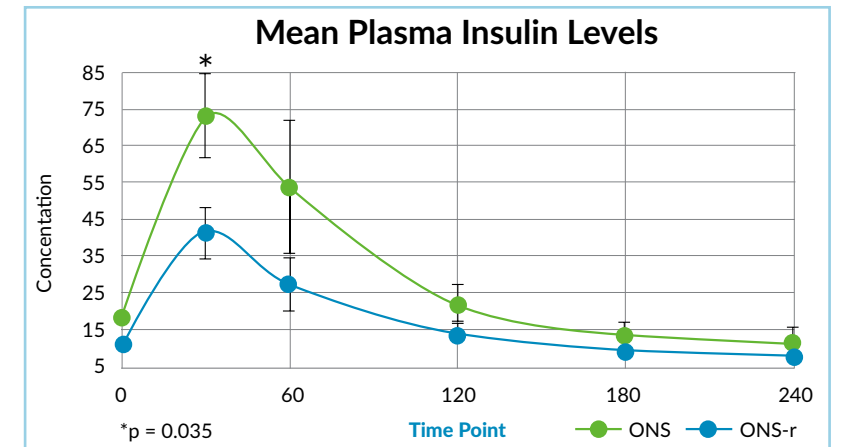


Figure 3. Mean Plasma Insulin Levels Between ONS and ONS-r

CONCLUSION

- No differences were found between ONS and ONS-r in plasma arginine, total fatty acids, EPA, or DHA AUCs, suggesting that these nutrients are absorbed similarly regardless of calories and carbohydrates consumed
- Significant differences were found in glucose and insulin concentrations at specific time points, suggesting that the reduction in carbohydrates from ONS to ONS-r may improve glucose and insulin response in healthy individuals