



## Acute increase in either simple sugars or complex carbohydrates: negative impact on plasma lipids of individuals with desirable plasma lipids

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Evidence on the impact of enhanced CHO intake on plasma lipids in well-trained individuals is very limited and exclusively relates to the impact of high CHO diet<sup>(2)</sup>. It is inconclusive whether simple sugars provided through supplementation, and increase in dietary complex CHO, have the same effect on plasma lipids.

The aim of this study was to examine whether acutely increasing CHO intake, by means of either hyperhydrating with creatine, glycerol and glucose (Cr/Gly/Glu) supplement or dietary intervention aimed at increasing muscle glycogen and exercise performance, leads to negative changes in plasma lipids of endurance trained individuals.

Eleven healthy endurance-trained males took part in Cr/Gly/Glu supplementation study (age, 31 ± 10.5 y; BMI, 23 ± 1.8 kg/m<sup>2</sup>; VO<sub>2</sub> max, 61 ± 3.9 mL/kg/min) and seventeen healthy active individuals (age, 25 ± 4 y; BMI, 21 ± 2 kg/m<sup>2</sup>; VO<sub>2</sub> max, 57 ± 6 mL/kg/min) in the dietary intervention study. Participants of the supplementation study consumed a Cr/Gly/Glu solution (11.4 g of Cr-H<sub>2</sub>O, 1 g of Gly/kg BM and 150 g of Glu) for 7 days. Participants of the dietary intervention for 7 days were on a prescribed high CHO diet, the energy content of which was based on habitual energy requirements. In both studies, fasting blood samples were collected before and after interventions.

Proportion of energy provided by CHO was significantly increased during both Cr/Gly/Glu supplementation (Pre, 53 ± 4 %; Post, 68 ± 2 %, *P* < 0.05) and dietary intervention (Pre, 53 ± 2 %; Post, 70 ± 1 %, *P* < 0.05) and proportion of energy obtained from fat was reciprocally reduced. Fasting concentration of TAG before and after high CHO diet and before and after supplementation with Cr/Gly/Glu are shown in the table below.

	Dietary Intervention Study				Cr/Gly/Glu Supplementation Study			
	Habitual Diet		High CHO diet		Habitual Diet		Post supplementation	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
TAG	0.83	0.33	1.01	0.48 <sup>a</sup>	0.89	0.80	1.30	0.79 <sup>a</sup>
T-chol	3.86	0.77	3.74	0.92	4.78	0.70	4.36	0.70
HDL-chol	1.58	0.33	1.44	0.39 <sup>b</sup>	1.70	0.40	1.50	0.30
LDL-chol	1.90	0.65	1.85	0.70	2.86	0.40	2.66	0.50
Glucose	4.91	0.30	4.87	0.30	4.80	0.40	4.90	0.20
Insulin	3.68	1.99	3.53	1.30	2.80	0.39	2.90	0.60

TAG, plasma triacylglycerides, T-chol, total cholesterol, HDL-chol, high density lipoprotein, LDL-chol, low density lipoprotein. Units are in mmol/L apart from insulin (μU/mL). <sup>a</sup> Significantly (*P* < 0.05) higher and <sup>b</sup> Significantly (*P* < 0.01) lower from Habitual Diet.

In conclusion, these findings suggest that even in endurance trained individuals, enhancement in CHO arising from both increased intake of sugars and combined increase in the intake of starch and sugars, adversely modifies plasma TAG concentration.

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