

Impact of High Energy Nutritional Supplement Drink consumed for five consecutive days on cardio metabolic risk factors in underweight females

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In our previous study, we demonstrated that in young healthy lean women consumption of High Energy Nutritional Supplement drinks (HENSD) enhances daily energy intake and therefore promotes positive energy balance⁽¹⁾. Previous evidence suggests that acute changes in energy balance may modify fasting and postprandial concentrations of triglycerides (TAG), glucose and insulin^(2, 3). This study aims to find out that whether consumption of HENSD in the evening for five days has a detrimental impact on plasma lipids, glycaemia and insulinaemia.

Twenty-three healthy females with a mean (SD) age of 25(5) years participated in a single blind randomised controlled, crossover study. Participants consumed HENSD (594 kcal) or PLACEBO (91kcal) for five days in the evening. Participants were asked to record their dietary intake during days of supplementation. On the sixth day plasma lipids, insulin and glucose concentrations were measured in the fasted state and at 30, 60, 90 and 120 minutes after *ad libitum* buffet breakfast and lunch.

Averaged daily energy (HENSD, 9.2(0.3) MJ; PLACEBO, 8.2(0.4) MJ, $P = 0.03$), carbohydrate (HENSD, 286 (11) g; PLACEBO, 249 (13) g, $P = 0.03$) and fat (HENSD, 91.1(6) g; PLACEBO, 70.8 (4) g, $P = 0.007$) intake were significantly higher in HENSD trial. Data on fasting and postprandial concentration of plasma insulin, glucose, lipids and HOMA_(IR) are presented in table below.

	HENSD	PLACEBO
Fasting Insulin (mU/L)	5.19 (0.56)	3.47 (0.27)*
Fasting Glucose (mmol/L)	4.72 (0.19)	4.55 (0.29)
HOMA _(IR)	1.08 (0.13)	0.68 (0.05)*
Fasting total Cholesterol (mmol/L)	5.56 (1.13)	5.30 (1.04)
Fasting HDL-Cholesterol (mmol/L)	1.76 (0.31)	1.62 (0.29)
Fasting LDL-Cholesterol (mmol/L)	3.39 (0.84)	3.23 (1.01)
Fasting TAG (mmol/L)	0.88 (0.30)	0.83 (0.27)
Insulin AUC (mU/L)	24.22 (3.67)	26.24 (4.11)
Glucose AUC (mmol/L)	5.46 (0.21)	5.51 (0.34)
TAG AUC (mmol/L)	0.97 (0.35)	0.99 (0.38)

Values are presented as mean ± SE ($n = 11$). *Significantly different ($P < 0.05$) from HENSD. Postprandial concentrations are presented as AUCs (time-averaged areas under concentrations vs. time curve).

In conclusion, short-term supplementation with HENSD can be expected to reduce insulin sensitivity but have no impact on fasting lipids and postprandial lipemia, insulinaemia and glycaemia.

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