Proceedings of the Nutrition Society (2011), **70 (OCE6)**, E372 doi:10.1017/S0029665111004575

Winter Meeting, 6–7 December 2011, 70th Anniversary: Body weight regulation – food, gut and brain signalling

Mycoprotein reduces insulinemia and improves insulin sensitivity

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Type 2 diabetes mellitus (T2DM) is a metabolic disorder characterised by hyperglycaemia in the context of insulin resistance or relative insulin deficiency. The World Health Organisation estimates that the number of people with diabetes will reach 366 million by 2030[(1)]. If not treated, T2DM can result in serious complications including renal failure, blindness and coronary heart disease. Lifestyle modifications such as increased physical activity and dietary changes can delay or prevent the onset of T2DM[(2)]. It has therefore become a scientific priority to discover novel dietary supplements capable of improving metabolic profiles.

Mycoprotein is a vegetarian meat-replacement food ingredient commonly consumed in the United Kingdom. Previous data showed that the consumption of mycoprotein reduces post-prandial concentrations of glucose and insulin at 30 and 60 min respectively when compared to an isocaloric control drink matched for macronutrient content[(3)]. The aim of the present study was to assess for the first time whether the consumption of an average serving of mycoprotein would lower post-prandial levels of glucose and insulin and improve insulin resistance over 3 hours in comparison to whey protein. To our knowledge no previous study had compared mycoprotein to whey protein.

We recruited 10 overweight healthy adults. Volunteers were asked to consume a soup containing 30 g of mycoprotein or whey protein in a randomised order following an overnight fast on two separate occasions. Both meals were isoenergetic and matched for macronutrient content. Fasting and post-prandial levels of glucose and insulin were measured at regular intervals. Plasma levels of glucose were measured using an Abbott ci8200 analyzer. The insulin analysis was performed by radioimmunoassay using a Millipore Human Insulin Specific RIA Kit (Millipore Corporation, Billerica, USA). The incremental areas under the curve (IAUC) for glucose and insulin were calculated and post-prandial insulin resistance (PPIR) was compared following the consumption of the meals using the homeostatic assessment model: *PPIR = IAUC glucose (mmol/L per min) * IAUC insulin (mU/L per min)/22.5*.

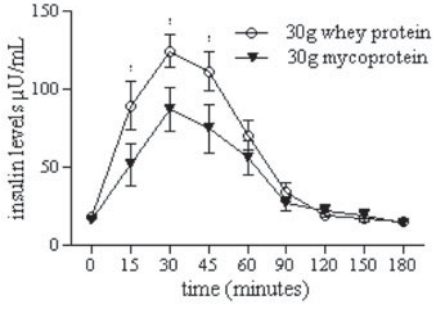

Figure 1. Insulin profile $*p<0.05$

	IAUC Glucose (mmol/L/min)		IAUC Insulin (mU/L/min)		PPIR	
	mean	SE	mean	SE	mean	SE
Whey protein	55.3	10.3	5834	409	14667	3066
Mycoprotein	42.9	7.2	4034[b]	794	8191[a]	2416

[ab] Significantly different from whey protein control (paired T-test).
[a] $P<0.05$, [b] $P<0.01$.

Figure 1 demonstrates a significant reduction in insulin levels at 15, 30 and 45 minutes following the consumption of mycoprotein using a repeated measurements 2-way ANOVA ($P = 0.0359$ with Bonferroni posttests). The insulin IAUC was significantly lower after the consumption of mycoprotein compared to whey protein ($P = 0.008$) as shown on table 1. Mycoprotein significantly improved PPIR compared to whey protein ($P = 0.0165$).

These results confirmed that mycoprotein could play a role in glucose homeostasis and might be of benefit in the dietetic prevention of T2DM.

This study was supported by Marlow Foods, Stokesley, UK.

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