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 20301. 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 T2DM2. 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 content3. 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:

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PPIR = \frac{\text{IAUC glucose (mmol/L per min)} \times \text{IAUC insulin (mU/L per min)}}{22.5}.
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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.

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