

Comparison of the effects of meat and mycoprotein on satiety and post-prandial lipemia

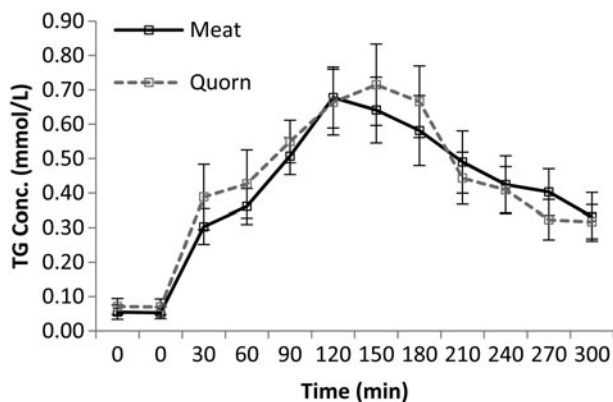
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It is becoming increasingly recognised that meat production represents an inefficient use of finite resources and may be rendered unsustainable by global population growth and the impact of climate change¹. Furthermore, red, particularly processed, meat consumption may impact on the development of a range of chronic diseases including cardiovascular disease (CVD) and certain (predominantly colon) cancers². Mycoprotein is a food produced by continuous fermentation of *Fusarium venenatum*, which can be flavoured and textured to resemble meat. Production of mycoprotein may be more sustainable than meat and it has also been reported to have beneficial effects on fasting plasma lipids³. It has now been recognised that raised triacylglycerol (TG)-rich lipoproteins, such as chylomicrons (CM) and very low density lipoprotein (VLDL), during the post-prandial state, are a potential risk factors for CVD⁴. The aim of this study was to determine any differences in satiety and post-prandial lipemic responses when comparing a meals containing meat or mycoprotein.

The study was approved by the University of Nottingham Medical School Ethics Committee. 11 male volunteers were asked to consume two spaghetti bolognese meals, of similar macronutrient content, at least one week apart. One meal contained Quorn™ (mycoprotein) mince and the other beef mince. Blood was taken at baseline (B) and every 30 min, for 5 hours post-meal (PM). A Satiety Labelled Intensity Magnitude (SLIM) scale was used to measure hunger and fullness at B and at 60 minute intervals PM. CM and VLDL were obtained from plasma by sequential density-gradient ultracentrifugation and colorimetric assays were performed to determine TG concentrations in plasma. Data was analysed using two-way repeated measures ANOVA.

No significant differences were seen in satiety scores between the two meals. The Figure shows the increase in plasma CM TG following the meals and that no significant difference was seen between the two protein sources ($P = 0.604$). There was also no significant difference in VLDL or total plasma TG.



This study demonstrates that mycoprotein can be used to replace meat without impacting on satiety. While beneficial chronic effects of mycoprotein on plasma lipids have previously been reported, we found no impact on post-prandial lipemia.

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1. Stehfest E, Bouwman L, van Vuren DP *et al.* (2009) *Climate Change* 95, 83–102.
2. Salter AM (2013) *Animal Frontiers* 3(1), 20–27.
3. Turnbull WH, Leeds AR & Edwards GD (1990) *Am J Clin Nutr* 52, 646–650.
4. Williams CM (1997) *Proc Nutr Soc* 56, 679–692.