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## Mycoprotein fractions from the Quorn fermentation co-product as novel functional ingredients for the food industry

Julien Lonchamp<sup>1</sup>, Paul S Clegg<sup>2</sup> and Stephen R Euston<sup>3</sup><sup>1</sup>Queen Margaret University, UK<sup>2</sup>University of Edinburgh, UK<sup>3</sup>Heriot-Watt University, UK

The production of mycoprotein by Marlow Foods for use in their meat-replacer product Quorn offers a potential sustainable, environmentally-friendly and cost-effective alternative to functional proteins of animal origin. This study assessed the functional profile of an unexploited liquid co-product (centrate) from the Quorn fermentation process, its potential as partial egg white replacer and the modulation of its functionality by sonication. A High-Molecular Weight (HMW) fraction was obtained from the centrate via ultrafiltration and displayed outstanding foaming stability, emulsifying and rheological (viscosity, viscoelasticity and gelation) properties in comparison with whey protein concentrate. Large mycelium structures observed in the HMW extract could be responsible for its rheological properties. The foaming and emulsifying stability of HMW could result from the release of surface-active moieties and/or from the dense mycelial network. These results highlighted the potential of functional extracts from the Quorn fermentation process as novel ingredients. The study then assessed the functional profile of a range of mixtures of Egg White (EW) and HMW. These results indicated that the use of HMW could allow for a 25% EW replacement as foaming agent and a 25% to 50% EW replacement as gelling agent. Large protein aggregates and fungal cell debris were reported in the EW-HMW mixtures and possibly contributed to foam stabilisation and high viscosity and viscoelasticity. Sonication of a HMW solution led to the breakdown of the large mycelial structures into smaller fragments and to smaller emulsion oil droplet size distributions. Confocal micrographs suggested that the small fungal fragments contributed to the stabilization of oil droplets. 50% oil-reduced HMW emulsions were prepared by mixing HMW emulsions (untreated and sonicated) with sonicated HMW solutions and displayed smaller oil droplet size distributions. These results highlighted the potential of mycoprotein extracts as oil-reducing agents in emulsion-based products.

JLonchamp@qmu.ac.uk