

# Sustainable future of food – production of first-class protein alternative for a balanced diet.

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## Executive Summary

Quorn is the brand name for a wide range of food products made with the meat-free protein ingredient, Mycoprotein. Quorn is a no-cholesterol, low-fat, low-sat fat and high-fibre meat-free protein source that contributes to a balanced diet. Quorn has a low manufacturing impact compared to other protein-rich products, such as meat. Quorn represents an alternative dietary protein source which, compared with animal derived sources, imposes a significantly lower environmental burden.

## Introduction

The sustainability challenges of global food production have been noted by world leaders and researchers in recent years, and awareness among the public is increasing. By 2050 world population is set to increase to over 9 billion, 30% higher than today. In order to feed this larger, wealthier and more urban population, food production will need to rise by 70%<sup>1</sup>. Sustainable solutions for production of high-nutrient foods will become the focus as the planet accommodates this population growth.

A balanced diet rich in foods that are good sources of fibre, vitamins and minerals whilst being low in saturated fats, salt and sugar is key to human health. Protein-rich foods are an important part of that diet, but finding sustainable sources are essential to meeting the increasing need.

Adoption of alternative protein sources, such as Quorn, as well as lowering intake of proteins derived from meat as part of a healthy eating plan have been advocated by a number of organisations.

A recent Carbon Trust<sup>2</sup> report highlighted the need for more protein diversity in British diets after finding that the consumption of more diverse sources of protein would result in health benefits as well as reducing the environmental impact of food. The report made the case for a 'flexitarian' approach to meal choices, encouraging consumers to experiment with recipes that don't use meat as the main protein source. Furthermore, House of Commons International Development

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<sup>1</sup> Food and Agriculture Organisation of United Nations (2009) *How to feed the world in 2050*. Available at: [http://www.fao.org/fileadmin/templates/wsfs/docs/expert\\_paper/How\\_to\\_Feed\\_the\\_World\\_in\\_2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)

<sup>2</sup> Carbon Trust (2014) *Quorn, beef and chicken footprints*. [internal report]

Committee's<sup>3</sup> report on food security reinforced the need for a change of behaviour such that meat is seen as an occasional treat, rather than everyday staple.

Many consumers are now choosing to eat less meat for a variety of reasons, but spurred by an increased awareness of the environmental impact of meat production. Quorn aims to give consumers more choice by providing a sustainable and healthy alternative source of protein.

## Quorn

Quorn is the brand of a wide range of food products made with the meat-free protein ingredient, Mycoprotein. The range of products includes mince, chicken-style pieces, sausages, burgers and ready meals.

### Nutritional information

Quorn is a no-cholesterol, low-fat, low-sat fat and high-fibre meat-free protein source that contributes to a balanced diet. Quorn's main ingredient, Mycoprotein is produced by a fungus called *Fusarium venenatum* which is grown in fermenters using glucose and minerals for food. Quorn is made by mixing Mycoprotein with egg white and seasoning. The structure of Mycoprotein means the ingredient replicates the taste and texture of meat.

### Carbon Footprint

Food production is a major contributor to emissions and thus climate change. Quorn Foods was the first global meat-alternative brand to achieve third-party certification of its carbon footprint figures, achieving Carbon Trust certification back in 2012.

Continuous carbon footprint reduction is at the heart of Quorn's sustainability goals. Quorn has developed a product carbon footprint methodology which allows for careful monitoring of emissions 'hotspots' along the entire supply chain, meaning that Quorn's carbon footprint is a result of a number of efficiencies and emissions reductions realised by Quorn suppliers. That resulted in the brand succeeding in improving the carbon efficiency of production process by 14% between 2012 and 2014.

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<sup>3</sup> House of Commons International Development Committee (2013) *Global Food Security*. Available at: <https://www.publications.parliament.uk/pa/cm201314/cmselect/cmintdev/176/176.pdf>

### Water

Quorn has the potential to provide a protein source that is efficient in its use of water resources<sup>4</sup>. Quorn has reduced relative water usage across our 3 main manufacturing sites by 12% so far based on a 2012 baseline. Moreover, current data suggests that the water footprint of Quorn could be 10 times smaller compared to one of the most popular protein sources, beef<sup>5</sup>.

### Land use

The growing demand for food is going to mean that more efficient solutions are needed as land becomes scarcer and more of it is adapted for food production. Quorn is a highly efficient product that only needs 2kg of wheat for 1kg of Quorn, compared with 12-24 kg of feed needed for 1kg of beef<sup>6</sup>.

### Energy

Quorn is continuously striving to develop methods to use less energy and fewer natural resources. The company is investing in an instalment of a third Mycoprotein fermenter at its Billingham site to meet the global demand for Quorn. To ensure energy efficiency across the site, two heat exchanges have been installed to recover heat from fermenters, saving £300,000 of energy per year.

At the Methwold site, Quorn is switching from kerosene to LPG in June 2015. This will deliver a cost saving of £160,000 as well as significant carbon reduction of almost 300 tonnes, equivalent to 3.5% of the total CO<sub>2</sub> for the site.

### Packaging & Waste

Quorn achieved zero waste to landfill at the Stokesley site in 2015 and the Methwold site follows closely with 99% of waste avoiding landfill. Quorn has been awarded the Greener Path Award for Landfill Diversion by ACM Environmental Plc and in association with British Council for Sustainable Development.

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<sup>4</sup> Hoekstra, Ay (2013) *The water footprint of modern consumer society*. Routledge, UK

<sup>5</sup> Mekonnen, M. and Hoekstra, A. (2012) *A global assessment of the water footprint of farm animal products*. Ecosystems 15, 401-415

<sup>6</sup> Ramirez, CA., Patel, M and Blok, K. (2003) *How much energy to process one pound of meat? A comparison of energy use and specific energy consumption in the meat industry of four European countries*. Energy 31 (2006) 2047-2063

Regarding packaging, light weighting of packaging is a standard requirement at product design stage, resulting in less material, energy use, logistics and waste throughout the supply chain.

### **Supply Chain**

As 75% of Quorn's emissions lie with the raw materials used, supply chain management is key. Quorn works with suppliers to ensure that they share the same ambitions on minimising environmental impacts and improving efficiency. Over the past three years, Quorn has increased the typical pallet loading by 8% and removed 3,772 delivered pallets from the supply chain – equivalent to 145 vehicle loads.

Supply chain collaboration highlights include ensuring all suppliers are members of the Sustainable Palm Oil (RSPO).

### **Conclusion**

Quorn as a company continuously strives to better its sustainability credentials. As presented above, Quorn already has minimised environmental impact, whilst nutritional value of the product, such as high protein content, no cholesterol, low-sat fat content and high fibre percentage, make Quorn an alternative dietary protein source which helps to diversify the modern diet, whilst maintaining good health of the planet. Quorn is continually striving to minimise the product's environmental impact. Although the company has had many successes so far, Quorn's ambition is to continue to be a sustainable protein choice for people who care about the environment as well as their health, which will require constant innovation to limit the product's impact.