MARLOW FOODS LTD, TRADING AS QUORN FOODS - WRITTEN EVIDENCE (FDO0050)

Re: Call for evidence

This submission of evidence is provided by Marlow Foods Ltd, trading as Quorn Foods. Marlow Foods Limited appreciates the opportunity to provide evidence for the House of Lord's Parliamentary Select Committee call for evidence on 'food, diet and obesity'. Marlow Foods, headquartered in the North-East of England, is the first and largest producer of mycoprotein and is home to the world's first alternative protein brand, Quorn, which uses mycoprotein as its key ingredient. Quorn products are sold in over 20 countries around the world including the United Kingdom, where it has been sold since 1985 and is marketed as a meat alternative. Indeed, Marlow Foods's purpose is to provide healthy food for people and planet and is committed to supporting consumers who wish to reduce their meat consumption, do so in a healthy and sustainable way. In this submission of evidence, we are providing input into topics 5 to 8.

Marlow Food's submission focuses on the challenges surrounding the use of concept of ultraprocessed food (UPF), as defined within the NOVA classification systems, in the context of healthy sustainable diets, particularly the notion that all highly processed foods are unhealthy, if they are classed as NOVA 4, regardless of their nutritional value. As a food manufacturer with a portfolio of mycoprotein containing products, that is high in fibre and protein and predominantly non-HFSS, we have been investing in nutrition and health research for the last four decades. Research using both in vitro methods and randomised controlled clinical trials, into the effects of mycoprotein and foods containing mycoprotein (the latter would be considered as NOVA 4 and therefore UPF), has demonstrated a number of health benefits, including a lowering effect on both total and LDL cholesterol, no adverse effect on blood glucose control and an emerging benefit on gut health through an increase in beneficial gut bacteria and a reduction in faecal genotoxins. There is also preliminary evidence that mycoprotein containing meals exert latent satiety effects, which could be important for longer term weight management. The health associations observed following the consumption of mycoprotein containing foods, which would be considered as NOVA 4, contradict the findings from low quality, epidemiological studies, which suggest that such foods are associated with adverse health outcomes. At present, there is a dearth of high-quality randomised-controlled trials comparing the effects of diets high in so-called UPF and diets which are high in processed foods and particularly a lack of research on the effects of so-called UPFs which are non-HFSS in addition. The term UPF has replaced other terms used in popular culture to describe foods high in saturated fat, salt and sugar (HFSS), such as 'junk food', despite UPF not considering the nutritional value of a food whatsoever, and therefore, highly risks healthy foods which form part of the EatWell Guide being misclassified. The term HFSS is well considered as a means of differentiating less healthy from healthier foods in the UK diet and has been incorporated effectively into national health policies, both planned and implemented. Experts from the Scientific Advisory Committee on Nutrition (SACN), the British Nutrition Foundation and the academic nutrition community have reiterated that the current public health nutrition guidance

is fit for purpose, and that nutrition is the best indicator of the healthfulness of a food. SACN has concluded that existing dietary recommendations address the concerns regarding UPF, through advice to limit HFSS foods. If the concept of UPF was to be incorporated into public health policy, there would be a high risk that foods that are of high nutritional value, and play an important role in healthy, sustainable diets, could be unfairly demonised, having unintended consequences on the nutritional health of the population, and adverse economic effects on segments of the food industry. This is particularly true for foods with a lower carbon footprint such as non-animal alternatives to animal foods such as meat and dairy foods.

The below sets out our argument and evidence in more detail.

Topic 5. The definition of a) ultraprocessed food (UPF) and b) foods high in fat, sugar and salt (HFSS) and their usefulness as terminologies for describing and assessing such products.

We would like to illustrate the challenge of defining UPFs in the context of a nutritious and sustainable diet using the example of mycoprotein and Quorn products. We believe UPF is an unhelpful term that misclassifies many healthy foods, which are recognised in the UK Eatwell Guide.

Mycoprotein is a term used to describe fermentation-derived fungal biomass, which in the case of Quorn's mycoprotein is a whole food ingredient, comprising solely of the naturally occurring filamentous fungus, Fusarium venenatum. Mycoprotein, as pure fungal biomass, can be considered a minimally processed food, due to the fact that it is purely fungal hyphae. For more details on the fermentation process and mycoprotein harvest see Finnigan et al., 2024. Mycoprotein is listed as a healthy source of protein within the UK Eatwell Guide (Public Health England, 2018) and is also highlighted as a sustainable protein source by the British Dietetic Association in their One Blue Dot, reference guide for health and environmental sustainability (BDA, 2020).

Mycoprotein is high in protein and provides all nine indispensable amino acids and is a high-quality protein, with a PDCAAS of 0.996 (Edwards & Cummings, 2010). It has been demonstrated to be bioavailable source of amino acids (Dunlop et al., 2017) and capable of stimulating muscle protein synthesis to the same extent as animal protein in both young and old adults (Monteyne et al., 2020; 2021; 2023). Not only is mycoprotein high in bioavailable protein, it is high in fibre (6%: predominantly as beta-glucan and with chitin also). It is also low in saturated fat and is free from cholesterol and trans fats. Mycoprotein derived from Fusarium venenatum, is a source of a number of micronutrients, notably riboflavin, choline, folate, manganese, selenium, phosphorus and zinc, (Quorn Nutrition, 2022). Mycoprotein, like fungi in general, is low in phytic acid, and mycoprotein containing foods provide a bioavailable source of zinc (Mayer Labba et al., 2022; Latunde-Dada et al., 2023).

Mycoprotein has a potential role to play in the transition towards healthier and more sustainable diets. Modelling work undertaken by the Potsdam Institute for Climate Impact Research has demonstrated that by substituting 20% of global per-capita ruminant meat consumption with microbial protein, in the form of mycoprotein, by 2050, future increases in global pasture area could be offset, resulting in an almost 50% reduction in annual deforestation and associated carbon dioxide emissions

(Humpenöder et al., 2022). Additionally, mycoprotein's environmental footprint has shown to be less than that of a variety of animal and plant proteins, when considering land and water use and greenhouse gas emissions (Carbon Trust, 2022).

The Quorn brand sells both vegetarian and vegan alternatives to meat (e.g. mince, pieces, fillets, deli, breaded and battered alternatives), using mycoprotein as the main ingredient. The vast majority (~90%) of the Quorn portfolio is non-HFSS (data available on request). New launches within the portfolio are formulated to meet category specific nutrition profiles which incorporate government calorie and salt reduction targets as well as ensure that all products are a source of fibre and/or protein. Furthermore, products are aligned with traffic light labelling for saturated fat and sugar, to ensure they are responsibly formulated (the exception to this is the pastry category, whereby it is not technically feasible to produce pies and pastries with amber traffic lights for saturated fat, which are non-HFSS).

Despite the portfolio being predominantly non-HFSS, all products within the Quorn portfolio fall into the NOVA 4 category of processing as defined by Monteiro et al (2019), and are therefore UPF, due to the presence of firming agents (which bind mycoprotein fibres together in finished products) and other additives. It is currently not possible to reformulate Quorn products to fall into other categories of the NOVA classification, although this may be possible in the future. Unlike many other foods which are classified as UPF, Quorn products are typically at least a source of both fibre and protein, and many are low in saturated fat. We have an active sodium reduction programme and new launches must meet PHE's 2024 salt reduction targets.

Evidence for an association between UPF and health is based predominantly on cohort studies and until recently had only considered UPF foods in their totality, rather than considered UPF foods by category. Cohort studies are not high on the hierarchy of evidence pyramid in terms of their strength or quality of evidence, and many cohort studies or research into the effects of UPF have used data which cannot determine whether a food is UPF or not. To date, one randomised-controlled trial (Hall et al., 2019) has been conducted on a small number of subjects (n=20), which suggested a high UPF diet, compared to an unprocessed food diet was associated with increased energy intakes (508 kcal/day) and weight gain because of the higher caloric intake. However, there are a number of flaws in the study, including a lack of fruits and vegetables in the diet and a lower fibre intake. Indeed, one of the numerous hypotheses to 'explain' the relationship between UPF rich diets and adverse outcomes is the fact that diets are low in fibre and protein (factors which are considered when determining whether a food is HFSS or not) (Lane et al., 2024; O'Connor et al., 2023).

Cohort studies are being cited and used in meta-analyses to argue that there is a link between UPF consumption and adverse health outcomes. However, a recent umbrella review of meta-analyses on UPF from Lane et al., (2024), while suggestive of a link between higher intakes of ultraprocessed foods and adverse health outcomes, recognises that the existing evidence base is insufficient to establish causality due to weak evidence (low and very low GRADE against GRADE criteria) and that there may be a number of reasons beyond processing, including general unhealthy eating patterns independent of the level of processing.

If epidemiological studies are being used to claim a link between UPF and adverse health outcomes, then cohort studies which look at the categorisation of foods must also be considered. For example, a recent prospective cohort study assessed nine ultra-processed food subgroups and determined that plant-based alternatives (which includes fungi alternatives), UPF cereals and UPF breads showed no association with the risk of multimorbidity, while animal-based and sugar-sweetened beverages showed positive associations with multi-morbidities (Cordova et al., 2023), suggesting that not all UPFs are equal and that HFSS remains a better measure of healthfulness of a food. Additionally, a cross-sectional analysis of the impact of removing wholegrain foods from a regression analysis of NOVA 4 foods and cardiometabolic risk measures, found that UPF foods high in wholegrain did not significantly contribute 'to the deleterious associations previously observed between UPF intake and cardiometabolic risk factors' (Price et al., 2024).

Marlow Foods Limited has undertaken a comprehensive research programme over the last 40 plus years, working with universities and other academic institutions in the UK and beyond, to understand the effects of mycoprotein consumption on health: many of the studies undertaken have been randomised controlled trials. Quorn's research programme, both *in vitro* and *in vivo*, has shown that mycoprotein and more recently Quorn products may have a beneficial effect on several health outcomes including, cholesterol reduction (Shahid et al., 2023; Farsi et al., 2023a; Pavis et al., 2024), satiety and weight management (Turnbull et al., 1993; Burley et al., 1993; Bottin *et al*., 2016) and the gut microbiome (Fernandez-Julia et al., 2023; Farsi et al., 2023b; Colosimo et al., 2024), which challenges the rhetoric that UPF foods are associated with adverse health outcomes and highlights that HFSS is a much more helpful terminology to use in the assessment of health and food. It is believed that the structural complexity of mycoprotein and its high fibre content underpin Quorn's health benefits (Colosimo et al., 2020). This is covered in more detail in relation to topic 7.

Lockyer et al., (2023) in a consensus summary of an expert roundtable on the topic of UPF, stated that 'there was agreement that many foods classified as UPF are high in fat, sugars and/or salt and public health messages should continue to focus on reducing these in the diet since it is unclear whether reported associations between high intakes of UPF and poor health reflect poorer dietary patterns (defined by nutrient intakes), and nutrient-health relationships are well established". The Scientific Advisory Committee on Nutrition (SACN) identified concerns around the practical application of the NOVA classification to the UK setting and highlighted that there was inconsistency between NOVA category 4 (UPF) and existing dietary advice (SACN, 2023).

To that end, HFSS is quantifiable using the UK Nutrient Profiling Model (NPM), developed by the Food Standards Agency in 2004/5 (Department of Health, 2011) and has been incorporated into UK regulatory frameworks. The NPM, which comprises of a robust algorithm which takes the nutritional profile of a food into consideration, was originally developed as a means of restricting the advertisement of unhealthy foods to children and the term HFSS was introduced as part broadcasting restriction in 2007, to reduce children's exposure to adverts promoting foods high in saturated fat, salt and sugar. The NPM continues to be used as a tool to differentiate healthier from less healthy foods and encourage the promotion of healthier choices, with its

use expanding to restrict in-store and on-line location and by volume price of unhealthy foods (DHSC, 2023) as well as further advertising restrictions. More recently, an evaluation of agreement between the 2004/2005 NPM and the Eatwell Guide, showed good agreement between the two and suggested that the NPM-based food policy is broadly aligned with population dietary advice as depicted in the Eatwell Guide (Pinho-Gomes et al., 2021). The term HFSS was intended for use by legislators and enforcers (Rayner, 2017), and is frequently used by the food industry and experts and professional in the field of diet and health: it was not designed to be used as a consumer term.

Contrary to the NPM and the term HFSS, the term ultra-processed is subjective and ill-defined as 'no scientific, measurable or precise reference parameters exist for them' (Braesco et al., 2022; Visioli et al., 2022). Further, the NOVA classification system for processed foods does not consider the nutritional profile of a food at all, rather it deliberately discounts nutrition (Monteiro, 2009). This is despite the fact that nutrition is believed to be the most important determinant of health, a view stated by the British Nutrition Foundation (2023) while SACN (2023) concludes that existing dietary recommendations address the concerns regarding UPF and adverse health outcomes and that the consumption of UPF may be an indicator of wider unhealthy dietary patterns and lifestyle behaviours. Some experts have noted that the UPF definition is sociopolitical in nature and was never intended to be fit for purpose in assessing nutritional quality of foods or diets, therefore limiting its use in policymaking when attempting to robustly classify foods or improve nutrition-related health outcomes (Braesco et al., 2022; Chapman, 2024).

It is worth highlighting that processing classifications have been shown to cause confusion amongst professionals in the fields of nutrition, food technology, policy making, industry, and civil society when it comes to the classification of foods by level of processing (Sadler et al., 2022). Many foods which are included within the Eatwell Guide (wholemeal bread, fortified breakfast cereals, baked beans, tofu and mycoprotein) or those required for special diets (gluten-free foods, sip-feeds and infant formula) are classed as UPF (British Nutrition Foundation, 2023) and foods which are classified as UPF can have healthy nutrition profiles (Dicken et al., 2024). Dicken et al., (2024) report that UPF tend to have an unhealthier nutritional profile than minimally processed foods, but not processed foods, and that not all UPF have an unhealthy nutrient profile, based on traffic light labelling.

Topic 6. How consumers can recognise UPF and HFSS foods, including the role of labelling, packaging and advertising.

As a result of the fact that HFSS was never intended as a term to be used by consumers, there is a lack of consumer research on the use of the term HFSS and, therefore, no evidence exists either in support of or against the term's helpfulness to UK consumers in the selection of a healthy and sustainable diet, beyond that of the impact of the policies based on HFSS and the NPM.

Currently no foods are labelled as being HFSS in the UK, rather traffic light labelling is used to provide at-a-glance information on the nutritional content of a food based on individual nutrients, rather than an overall NPM score (which is used to determine whether a food is HFSS or not). However, it is worth noting that the cut-offs used to determine red traffic lights for saturated fat and sugar are aligned to an extent, with

the values in the NPM attributable to five points, and that the NPM has been adapted to be used as means of providing an overall indication of a food's nutritional value for use on front-of-pack in seven European countries, in the form of NutriScore (Hercberg et al., 2021) and the Health Star Rating in Australia. Despite the original NutriScore algorithm being updated last year, the original version used the same algorithm as the UK NPM and used various score range to depict the healthfulness of a food, denoting a food as healthy (NutriScore A) to less healthy (NutriScore E). A food that is deemed as healthy is classed as NutriScore B (0 to 2 points) which is close to the cut off used to define non-HFSS (≤3 points) and HFSS (≥4 points) foods. There are a number of studies reporting a benefit of NutriScore on encouraging consumers to select healthier choices of foods within a category (e.g. Devaux et al., 2024, van den Akker et al., 2022; Egnell et al., 2020), and NutriScore encourages manufacturers to reformulate their foods to improve their nutritional content and subsequently NutriScore (Ter Borg et al., 2021). Such research was conducted on the original algorithm and thus demonstrate the potential for the NPM and, therefore, HFSS classification has the potential to be used as a front of pack nutrition guide to drive healthier food choices.

It would be disingenuous to create a labelling system to depict UPF or introduce marketing restrictions on such foods, when there is a lack of a universally accepted definition of UPF (Gibney, 2018, Sadler et al., 2021) and definition ambiguity and a subsequent high risk of misclassification of foods (Sadler et al., 2022). This is despite calls for policy and labelling around UPF and research into consumer preferences around the labelling of UPF (Srour et al., 2023). Given that existing dietary advice is centred around nutrition, it would be at odds with long-standing dietary advice to use a labelling system which excludes nutritional value. Dicken (et al., 2024), in a review of traffic light labelling on processed foods, report that UPFs are less likely to have green traffic lights and more likely to have red traffic lights than processed and minimally processed foods, but that not all UPFs have unhealthy nutrient profiles. This indicates that traffic light labelling, or any other form of front-of-pack nutrition labelling, conveys important nutritional information which is not considered within the classification of UPF. Research has also been undertaken to understand the extent of alignment between the Australian Health Star Rating (HSR) system and NOVA. Barrett et al., (2023) found 'fair' agreement in the classification of foods as healthier or less healthy, with alignment for the majority of food and drink products. However, they also reported discordance between healthier foods scoring as healthier on the HSR, and NOVA 4, highlighting that there is a risk of confusion if both the HSR front-of-pack nutrition label was to be used in combination with NOVA. Furthermore, any product labelling that erodes consumer confidence in existing nutrition information on pack would disincentivise industry from participating in product innovation and renovation that incrementally improves nutrition profiles. For example, a manufacturer could achieve a significant reduction in salt, fat and sugar on a UPF product, positively impacting its nutrition traffic light labels yet the consumer may still regard that product as unhealthy because it would retain its status as 'UPF', thereby negating the value of investing in healthy innovation for that company. These types of risks to consumer choice, fair competition in the food sector, and responsible marketing are critical but often overlooked in current debates around UPF labelling.

The inherent contradictions of the NOVA model may in fact have negative impacts on consumer dietary behaviour if UPF labels were introduced, especially on choice and acceptability of plant-based options which can function as preferred protein sources and meal centres in healthy and sustainable diets. A recent Churchill Fellowship report highlighted the risks of consumers mis-identifying plant-based meat as 'unhealthy' simply because it falls into the UPF category, as this may 'discourage consumers from eating safer and more nutritious foods and jeopardise progress towards meeting climate and biodiversity goals' (Chapman, 2024).

Topic 7. The cost and availability of a) UPF and b) HFSS foods and their impact on health outcomes.

Quorn Foods' portfolio is predominantly non-HFSS but also classed as UPF and has health benefits as laid out below. This contradictory situation perfectly demonstrates the challenges with assuming that UPF foods are harmful to health and provide no nutritional value. As such, evidence laid out below relates to mycoprotein and foods made from mycoprotein which while being a source of fibre and protein, would still be considered UPF yet are non-HFSS,

As highlighted above, mycoprotein the key ingredient in Quorn Foods, is high in protein and fibre and low in saturated fat. It also provides a source of a number of micronutrients, notably riboflavin, choline, folate, manganese, selenium, phosphorus and zinc, (Quorn Nutrition, 2022). Quorn Food's longstanding research programme has shown a benefit of the consumption of mycoprotein and mycoprotein containing ffoods, which are considered UPF, on several health outcomes as follows:

- Mycoprotein containing foods have been shown in a meta-analysis and systematic review to lower total cholesterol, brought about by a reduction in LDL cholesterol. Shahid et al. (2023), in a meta-analysis of four studies totalling 81 subjects showed a significant reduction in total cholesterol and a non-significant reduction in LDL cholesterol. Since the publication of Shahid et al's review and meta-analysis, a further study of 20 subjects reporting on secondary endpoints, showed a significant reduction in both total (6.7%) and LDL cholesterol (12.3%), after two weeks of a mycoprotein-rich diet vs two weeks of processed meat-rich diet (Farsi et al., 2023a). Additionally, a randomized control trial of 72 community dwelling overweight adults with hypercholesterolemia, demonstrated that a diet rich in mycoprotein (consumed from Quorn products) lowers both total and LDL cholesterol by 5% and 10% respectively (Pavis et al., 2024). Together, these studies suggest that mycoprotein is likely to reduce total and LDL cholesterol when substituted for meat.
- Findings on the effect of mycoprotein on glucose and insulin metabolism, show no adverse effect of mycoprotein consumption on glucose or insulin homeostasis. Shahid et al., 2023 in their critical review and meta-analysis found no significant or conclusive effect of mycoprotein consumption on postprandial blood glucose or insulin concentrations. However, preliminary research suggests that mycoprotein may have a beneficial impact on energy intake and appetite. Desire to eat ratings (3h post-meal) and prospective food consumption were reduced after a mycoprotein-rich meal compared to an

isocaloric chicken-based meal (Turnbull et al., 1993). These results on subsequent food intake were confirmed by Burley et al. (1993), who reported a reduction in energy intake during ad libitum evening meal, following a mycoprotein-rich lunch compared to an isoenergetic chicken-based meal. It was hypothesized that the high-protein, high-fibre nature of mycoprotein impacted on late satiety. Further studies comparing a mycoprotein meal with isoenergetic chicken meals in healthy, overweight or obese adults, showed that a high-mycoprotein (132g) meal reduced ad-libitum energy intake by 10% compared to an isoenergetic chicken-based meal, three hours post-test meal. No significant effect was seen with lower doses of mycoprotein (44g and 88g). However, insulin was reduced with all levels of mycoprotein intake compared to chicken (Bottin *et al*., 2016).

- Mycoprotein is fermentable in the gut, resulting in the production of short-chain fatty acids and supporting an increase in beneficial gut bacteria in both *in vitro* and human studies. *In vitro* fermentation models have demonstrated that colonic bacteria ferment both mycoprotein and mycoprotein fibre to produce short-chain fatty acids (Harris et al., 2019; Colosimo et al., 2024). An *in vitro*, cross-feeding study has shown that the ß-glucan in mycoprotein can be metabolised by certain Bacteriodes species, to produce oligosaccharides, which are in turn utilised by other gut microbes, such as Bidobacterium and Lactiplantibacillus species (Fernandez-Julia et al., 2023), resulting in an increase in numbers of these beneficial gut bacteria. Additionally, mycoprotein consumption as Quorn, in a two-week, randomised, cross-over trial, has been shown to reduce levels of faecal genotoxins (associated with an increased risk of colorectal cancer) and nitroso compound excretion and to increase numbers of beneficial species of gut bacteria when compared to a diet of red and processed meat (Farsi et al., 2023b).
- UK dietary survey data suggests that the diet quality of mycoprotein consumers is higher than in non-consumers: analysis of the National Diet and Nutrition Survey (NDNS) suggests that mycoprotein intake is associated with lower glycaemic markers and energy density intake, and high fibre, energy intake, and improved diet quality scores (Cherta-Murillo & Frost, 2022), while diet modelling suggests that replacing meat with mycoprotein will lead to improvements in diet quality. Farsi et al., (2022) modelled a scenario based on data from the NDNS, whereby all self-reported meat consumption was replaced with meat alternative products, predominantly as mycoprotein (as part of wider series of replacements). Replacement with mycoprotein led to an increase in fibre and a reduction in saturated fat intake. Protein intakes were reduced (although protein requirements are greatly exceeded in the UK and other high-income countries) and sodium levels increased. Iron intake was not affected while vitamin B12 was reduced, but intakes still exceeded the reference nutrient intake.

The above highlights how a non-HFSS range of foods, which is classed as UPF has a role to play in promoting health. It is also pertinent to consider that most consumers using mycoprotein-containing products (and alternative protein products more broadly) are doing so through a desire to transition towards healthier and more sustainable dietary patterns that are consistent with public health goals, such as

increasing intakes of vegetable and pulses. As an established consumer-facing business we hear this anecdotally from our customers, meanwhile there is academic research to corroborate that incorporating meat alternatives can support more positive experiences of reducing meat consumption, and therefore act as an enabler to adherence to healthier dietary patterns with significantly more vegetable intake over time (Gillies et al., 2023). Dietary behaviour change is notoriously challenging to achieve and harder still to sustain, and it would be counterproductive to public health goals if consumer confidence in products that are effective tools to improve dietary quality is irreversibly damaged by governments endorsing the flawed terminology of UPF.

Based on the above, it is hard to reconcile the association between a health promoting, non-HFSS portfolio of products and its categorisation as UPF, which has putative adverse health outcomes based on low quality data. Well designed, high-quality randomised controlled trials of UPF vs processed foods are required to confirm or refute an association between UPF and adverse health outcomes. Research is also required which separates out HFSS and non-HFSS UPF foods to determine whether there is a real association, as non-HFSS foods, such as UPF breads, cereals and plant-based alternatives were not shown to be associated with risk of cancer or cardiometabolic outcomes in a prospective cohort study (Cordova et al., 2023). The importance of understanding behaviour change and the role of products within dietary patterns beyond solely their nutritional qualities and/or level of processing is also key to achieving long-term positive changes to diets.

Question 8: The role of the food and drink industry in driving food and diet trends and on the policymaking process

Industry has a role to play in bringing to market, healthy and sustainable foods, as well as providing investment in research to demonstrate the link between novel food ingredients and health, which may not otherwise have been undertaken. As one of the only truly novel foods of the last century, Marlow Foods has developed a robust research agenda to better understand the health and environmental credentials of mycoprotein and foods made from it. The nutrition research agenda is built from initial enquiries into the safety of mycoprotein in the 1970s, as part of the need to characterise mycoprotein and demonstrate food safety for novel foods approval in the UK and US. These early human and animal investigations indicated that mycoprotein may have benefits on metabolic health, such as cholesterol and glucose regulation. In the next two decades, research evolved into more focused clinical trials and this investment in clinical research has accelerated over the last several years as Marlow Foods has strengthened academic collaborations with leading UK universities and research institutes, to build the evidence base demonstrating the health benefits of mycoprotein. When working with such institutions, Quorn Foods has a 'no strings attached' research contract and a strategy for promoting peer-reviewed publications as open access, regardless of the study outcomes. This helps address any concerns relating to conflicts of interest. Marlow Foods has also been a grateful recipient of UKRI funding to further advance knowledge of mycoprotein and its functions in foods and health.

Without industry leading the way on supporting research and development into fermented fungi proteins, research into the understanding of the role of mycoprotein

in health would be lacking and the potential for mycoprotein containing foods to support a transition to a healthy and sustainable diet would be overlooked. Only in more recent years has funding been more widely available for novel foods research. Marlow Foods provides a positive example as to how industry can positively support policy on understanding the health benefits of novel foods.

Ultimately, it is argued foods and diets that are healthier and more sustainable (by already existing and internationally agreed standards) should be promoted by making them more affordable and widely available, regardless of their degree of processing (Chapman, 2024). This requires governments to seek to work more closely with the food industry, healthcare professionals, academia and civil society to co-develop policies that not only encourage healthier product innovation, but equally enable holistic educational programmes and campaigns to be delivered, especially in more deprived regions of the country where health disparities are most prevalent. Such programmes should focus on factors which enable long-term behaviour change, such as increasing knowledge and skills related to nutrition, food processing, cooking skills and improving infrastructure to enable healthier and more sustainable choices in current and future generations. As many food and drink businesses already invest in these types of activities in their communities and beyond – Marlow Foods included – there is the scope for a more collaborative and wide-reaching initiative should policymakers more effectively engage with and learn from industry expertise and best practice examples.

Thank you for your consideration and thoughtful approach to the evidence review process.

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