Extended Abstract
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Paper/Poster Title	Are plant-based proteins perfect substitute for meat?

Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	*200 words max*

There is a growing concern among policymakers and researchers about the negative health and climate impact of meat consumption. However, limited information is available about how price changes in animal protein sources affect plant-based protein demand and the consequences for nutrient intake and/or diet quality. The goal of the preset paper is to fill this gap by explaining how consumers react to prices changes in animal protein types and present the implications for nutrition or diet quality. The paper applied the Exact Affine Stone Index Implicit (EASI) Marshallian Demand System to the 2021 home scan panel data collated by Kantar Worldpanel to estimate both price and expenditure elasticities. Twelve food groups of seven animal-based protein products and five plant-based protein products were considered. The results reveal that increasing the price of animal protein sources will shift demand towards plant protein which will result in a significant reduction in cholesterol and fat purchases. However, there would also be a significant reduction in the total amount of protein, carbohydrate, and healthy fats such unsaturated fatty acid purchases by the average household. This shows that increases in plant-based protein are not enough to compensate for the reductions in essential macro- and micro-nutrient purchases from animal protein. From the climate perspective, reduction in meat purchases could potentially reduce emission from production and consumption.

Keywords	**Plant based protein, EASI demand system, Animal protein, Diet quality, Scotland**
JEL Code	**D120** Consumer Economics: Empirical Analysis see: www.aeaweb.org/jel/guide/jel.php?class=Q)

Introduction *100 – 250 words*

With growing concerns about climate change and sustainability, more and more consumers are recognizing the impact of animal protein production/consumption on climate change, soil and water resources (Moran & Wall, 2011) and are beginning to re-evaluate their dietary choices. In this context, plant-based proteins are of increasing interest to UK consumers as an alternative to animal proteins - 6 in 10 are willing to try plant-based products many of which are already on the market (Ibrahimi Jarchlo & King, 2022). Plant proteins are often rich in other nutrients such as dietary fibre (Dhingra et al., 2011), vitamins, minerals and antioxidants, as well as being low in saturated fat and cholesterol, which can help maintain heart health and reduce the risk of chronic diseases (Hertzler et al., 2020; Qin et al., 2022). Moreover, the production

of plant-based proteins has a lower environmental impact and has a positive effect on reducing greenhouse gas emissions and conserving natural resources (Detzel et al., 2022). As a result, there is a growing concern among policymakers and researchers about the negative health and climate impact of meat consumption. Consumers are being nudged to re-evaluate their dietary choices in order to preserve our ecosystem and reduce the burden of diet related diseases. However, limited information is available about how price changes in animal protein sources affect plant-based protein demand and the consequences for nutrient intake and/or diet quality. The goal of the preset paper is to fill this gap by explaining how consumers react to prices changes in animal protein types and present the implications for nutrition or diet quality.

Methodology	***100 – 250 words***

The paper applied the Exact Affine Stone Index Implicit (EASI) Marshallian Demand System to the 2021 home scan panel data collated by Kantar Worldpanel to estimate both price and expenditure elasticities. Twelve food groups of seven animal-based protein products and five plant-based protein products were considered.

Results	***100 – 250 words***

The results reveal that dairy and eggs are daily necessities for the people of Scotland. The demand for fish and non-dairy milk are the most price sensitive. Estimates based on expenditure elasticities show that beef is considered a luxury and a highly substitutable product in the Scottish diet. Peas are relatively basic, essential foodstuff. In general, increasing the price of animal protein sources will shift demand towards plant protein. On the positive side, there will be a significant reduction in cholesterol and fat purchases. However, there would also be a significant reduction in the total amount of protein, carbohydrate, and healthy fats such unsaturated fatty acid purchases by the average household.

Discussion and Conclusion	***100 – 250 words***

The results from the study show that if the price of animal protein increases, many consumers turn to plant protein products. This will in turn have a positive effect on the environment, and animal welfare. However, this shift may lead to a reduction in overall nutrient intake, which is consistent with Mariotti & Gardner (2019) who found that nutrient intake from plant proteins is low, and that there is the need to recognize the nutritional challenges involved and to take appropriate measures to ensure access to a complete and balanced nutrition.

References

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