

Extended Abstract

Please do not add your name or affiliation

Paper/Poster Title	Implications of increasing fruit and vegetable consumption in Scotland
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Abstract prepared for presentation at the 96th Annual Conference of the Agricultural Economics Society, K U Leuven, Belgium

4th – 6th April 2022

Abstract	<i>200 words max</i>
<p>The food system is a major cause of global warming and non-communicable diseases in Scotland. There is a need to change consumer behaviour towards a more sustainable lifestyle. The literature argues for diets high in fruit and vegetable but low in red meat and fat/sugar-based foods. The goal of the present study is to simulate the price change required to increase fruit and vegetable consumption by 10 per cent in Scotland using monthly food purchase data from 2013 – 2020 collated by Kanter Worldpanel. Unconditional food demand elasticities were estimated using an EASI demand mode and introduced into a model that calculates the shadow prices at constant taste or utility of diets. Results suggest that a 10 per cent increase in fruit and vegetable purchases would require subsidies of about 8.14 per cent and 42.96 per cent, for Processed vegetables and Fresh fruit, respectively. The resulting diet will be lower in Milk and milk products, Cheese, Non-carcass meat and meat products, Confectionery etc., but higher in Pickles and sauces, Fresh and processed potatoes, Bread, and Other cereals and cereal product. The net change in emissions is -0.7 per cent, indicating a positive effect of the policy. However, macronutrient purchase ratios before and after the policy were higher than recommended. The results of the average person are similar across different income groups.</p>	
Keywords	EASI Demand Model, Fruits and vegetables, Subsidies, Carbon emission, five-a-day
JEL Code	D12 Consumer Economics: Empirical Analysis; Q18 Food Policy see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	<i>100 – 250 words</i>
<p>The food system is a major cause of global warming contributing between 9 - 29 per cent of global carbon emissions. In addition, diet is believed to be a major cause of non-communicable diseases in Scotland, resulting in about 24 per cent of deaths and a reduction in life expectancy to 62.3 years. There is therefore the need to change consumer behaviour towards more sustainable lifestyles. The literature argues for diets high in fruit and vegetable but low in red meat and fat/sugar-based foods. To increase the consumption of fruits and vegetables in the UK i.e., Scotland, the government launched the “five-a-day” campaign in 2003 to increase fruit and vegetable consumption to 400 g/day through education and advertisement. However, after 18 years of its implementation, 2020 DEFRA food consumption data shows that Scottish</p>	

consumption of fruit and vegetables was 23 per cent below the recommended daily intake.

Methodology

100 – 250 words

The goal of the present analysis is to simulate the price change required to increase fruit and vegetable consumption by 10 per cent. This level was chosen because simulating the price change required to meet the proposed 400 g/day resulted in price changes outside the natural variation of price change. The study relied on monthly food purchase data from 2013 – 2020 collated by Kanter Worldpanel for Scotland. This data was used to estimate unconditional food demand elasticities using an EASI demand model for Scotland. The elasticities were introduced into a model that calculates the shadow prices that must prevail for consumers to increase their purchase of fruit and vegetables without changing the taste or utility of diets. Vegetables were disaggregated into Fresh green vegetables, Other fresh vegetables, and Processed vegetables. Similarly, Fruits were disaggregated into Fresh fruits and Processed fruits.

Results

100 – 250 words

For the average person, a 10 per cent increase in fruit and vegetable purchases would require subsidies of about 8.14 per cent and 42.96 per cent, for Processed vegetables and Fresh fruit, respectively. The resulting diet is lower in Milk and milk products, Cheese, Non-carcass meat and meat products, Confectionery etc., but higher in Pickles and sauces, Fresh and processed potatoes, Bread, and Other cereals and cereal product. The overall net change in emissions (compared to the initial diet) is - 0.7 per cent, indicating a positive effect of the policy. From the nutritional perspective, macronutrient ratios did not improve after the policy implementation; total fat and protein purchase ratios were higher than the required level whilst carbohydrate purchase ratio was lower. The distributional analysis shows that some income groups recorded higher (lower) impacts on consumption and emission than the average household.

Discussion and Conclusion

100 – 250 words

Our results suggest that subsidizing fruit and vegetable purchases can increase their consumption without compromising on climate goals. However, the overall impact on health will be lower since nutrient purchase ratios remain almost the same after the policy implementation.