



## Speaker Summary Note

**Session:** Economic Levers

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**Title:** Using Fat Taxes and Thin Subsidies to Improve Diet and Health<sup>1</sup>

### 1. Introduction

Public interest in the use of fiscal measures in the UK is typified by the proposal debated and rejected at the conference of the Scottish Local Medical Committee that a tax on chocolate might contribute to a reduction in obesity. A similar motion was debated in 2003 at the BMA annual representative meeting where a motion to impose a tax on saturated fat was defeated.<sup>2</sup> Interest extends to the US where a recent paper<sup>3</sup> has advocated the introduction of a tax on sugared drinks, an option which is amongst proposals that are currently under consideration by the United States Senate Committee on Finance as a means of raising revenue for health care reform. Evidence regarding the impacts of a fiscal policy on diet tends to focus on changes in the aggregate levels of food consumption of unhealthy products in the population as a whole. For example Marshall<sup>4</sup> [8] and Mytton et al.<sup>5</sup> extend VAT in the UK to products regarded as the main sources of saturated fats. Mytton et al. estimates that the ensuing variations in ischemic heart disease would lead to the avoidance of between 900 and 1,000 premature deaths every year. Whilst many studies<sup>6</sup> find that the impacts of a fiscal intervention on consumption are likely to be modest, these authors stress that a fat tax would be a useful tool to generate a revenue that could be allocated to prevention or information campaigns. In this vein and using Danish data, Jensen and Smed<sup>7</sup> investigate the effects of

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<sup>1</sup> This was paper was co-authored with Matthew Salois (Centre for Food Security, Department of Food Economics and Marketing, University of Reading, Earley Gate, P.O.Box 237, Reading RG6 6AR, UK) and Matthieu Arnoult (Land Economy and Environment Research Group, Scottish Agricultural College, Kings Buildings EH9 3JG, Edinburgh).

<sup>2</sup> Beecham, L. [2003]. Doctors vote against a tax on fatty food, *British Medical Journal* 327(7406): 72–81. URL: <http://www.bmj.com>.

<sup>3</sup> Brownell, K. and T. Frieden [2009]. Ounces of prevention—the public policy case for taxes on sugared beverages, *New England Journal of Medicine* 360(18): 1599–1605.

<sup>4</sup> Marshall, T. [2000]. Exploring a fiscal food policy: The case of diet and ischaemic heart disease, *British Medical Journal* 320(7230): 301–304.

<sup>5</sup> Mytton, O., Gray, A., Rayner, M. and Rutter, H. [2007]. Could targeted food taxes improve health?, *Journal of Epidemiology and Community Health* 61(8): 689–694.

<sup>6</sup> Chouinard, H., Davis, D., LaFrance, J. and Perloff, J. [2005]. The effects of a fat tax on dairy products, CUDARE Working Paper 1007, Department of Agricultural and Resource Economics, University of California, Berkeley, USA. Kuchler, F., Tegene, A. and Harris, J. [2005]. Taxing snack foods: Manipulating diet quality or financing information programs?, *Review of Agricultural Economics* 27(1): 4–20.

<sup>7</sup> Jensen, J. and Smed, S. [2007]. Cost-effective design of economic instruments in nutrition policy, *International Journal of Behavioral Nutrition and Physical Activity* 4(10).

nutrient- and food-based taxes, coupled with subsidies in order to produce revenue-neutral scenarios. In line with other studies, they find that dietary effects would be minimal, but, as far as nutrient intake is concerned, better results are obtained by focusing the tax on nutrient content rather than on specific food items (e.g., saturated fats vs. red meat).

## **2. Public health impacts of a fat tax.**

The use of a fat tax as a means of reducing the incidence of diet related disease is an example of the type of measure advocated in a substantial strand of the epidemiological literature, stemming from the work of Rose,<sup>8</sup> to tackle the incidence of population levels of disease. The basis for the advocacy of this approach to disease control is that the majority of deaths related to the condition occur amongst individuals who have only moderately bad diets. The corollary to this is that there will also be a very large number of individuals who would not die of diet related disease but who would also be affected by the policy.

We use a fully specified Almost Ideal Demand System to examine the impacts of fiscal regime in which a fat tax is combined with a subsidy on fruit and vegetables. The model was estimated using household data from the UK expenditure and food survey.<sup>9</sup> The tax is imposed as a 1 percentage point increase in the price of the good for every percentage point of saturated fat in the product. Thus full fat milk which contains 2.60% of saturated fats will see its price increasing by 2.60%.<sup>10</sup> We put a ceiling on the price increase of 15%. Our results show that average levels of saturated fat consumed fall from 14.13% of total energy intake to 13.84%. Fruit and vegetable consumption increases from 387 gramme per day to 425 gramme per day. These changes are insufficient to bring saturated fat consumption to within the recommended 10% of total energy but do increase fruit and vegetable consumption above the recommended minimum of 400 gramme per day. The changes are the result of moving the mean level of consumption and mask a wide variation in diet. As a result a considerable number of people remain a substantial distance from the recommended levels of intake.

Changes in the mean level of intake such as those described will result in a substantial number of lives saved because some individuals will benefit from marginal changes in their diet and there are a large number of people consuming close to the recommended levels. Arguably however the policy does little to address the diets of those who are of greatest concern: those that are some way away from the recommendations. We therefore construct a measure of the average risk of disease in the population that assumes that the risks of disease increase as a logistic function of the distance that an individual is above or below (as appropriate) a particular target. This measure is based on estimates of relative risk of disease taken from the literature and effectively computes a measure of the average risk in the population giving a higher weight to those individuals whose diets are particularly bad. Our results show that, relative to a situation in which everyone follows dietary guidelines the average risk of CHD in the population drops from a factor of 1.78 to 1.72.

In addition to the impacts of the tax on the intakes of fats and other unhealthy components of the diet, it is also important to recognise that some healthy nutrients will also be adversely affected. In particular calcium and vitamin D intakes fall by 3% and 4.5% respectively as a result of the policy.

## **3. Fiscal impacts of a fat tax.**

It is widely recognised that because of the declining importance of food in the budget of higher income households, a fat tax is regressive. In some investigations, the use of a subsidy on healthy foods is advocated as a means of negating some of this impact. There has however been little in the way of formal

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<sup>8</sup> Rose, G. [1985]. Sick individuals and sick populations, *International Journal of Epidemiology* 14: 32–38.

<sup>9</sup> Tiffin, R. and Arnoult, M. [2011]. The public health impacts of a fat tax, *European Journal of Clinical Nutrition*. URL: <http://dx.doi.org/10.1038/ejcn.2010.281>.

<sup>10</sup> The saturated fat contents were obtained from data supplied in the Family Food module of the Expenditure and Food Survey. The majority of the data is from the Food Standards Agency's nutrient analysis programme, supplemented by values from manufacturers and retailers.

welfare analysis of these policies. We employ to framework originating with Feldstein<sup>11</sup> and Ahmad and Stern<sup>12</sup> [1] and compute the distributional characteristic for individual foods. The distributional characteristic is used to measure the extent to which consumption of a particular good is concentrated in those households which are deemed to be socially deserving. The higher the value of the characteristic, the more concentrated the consumption of the food group is in the more socially deserving households. Our results show that milk has the highest distributional characteristic whilst that of fruit and vegetables is much lower. Thus we find that goods which are likely to be taxed a most concentrated in the socially deserving and those which a likely to be subsidized tend to be consumed by the less deserving. The policy investigated here is therefore highly regressive and made more so by combining the fat tax with a thin subsidy.

#### **4. Closing remarks**

The literature supports the fact that substantial numbers of lives may be saved as a result of the introduction of fiscal measures designed to make the population's diet more healthy. The widespread use of such instruments would raise important distributional questions however. First, since unhealthy foods tend to be consumed by poorer households, such a policy is likely to be highly regressive. Second, the lives that are likely to be saved are likely to amongst those that have relatively healthy diets which are not the individuals that are of greatest social concern. Finally, with improved screening for diet related disease, it is possible that a more targeted approach to prevention may prove more cost effective.

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<sup>11</sup> Feldstein, M. [1972]. Distributional equity and the optimal structure of public prices, *American Economic Review* 62: 32–36.

<sup>12</sup> Ahmad, E. and Stern, N. [1984]. The theory and reform of Indian indirect taxes, *Journal of Public Economics* 25: 259–298.