

What is the role of health-related food duties?

A report of a National Heart Forum meeting held on 29 June 2012

This report arises from the European Heart Health Strategy II project which has received co-funding from the European Union, in the framework of the Health Programme. Sole responsibility for this report lies with the National Heart Forum; the Executive Agency is not responsible for any use that may be made of the information contained herein.



What is the role of health-related food duties? National Heart Forum 2012.

Authors: Jane Landon and Hannah Graff

Published by the National Heart Forum
© National Heart Forum 2012

National Heart Forum

Victoria House

7th Floor

Southampton Row

London

WC1B 4AD

Phone: 020 7831 7420

nhf-post@heartforum.org.uk

www.heartforum.org.uk

Registered Charity No. 803286

Registered Company No. 287644

Contents

Key points and summary of recommendations	5
Introduction	8
The public health rationale for food taxes	8
Current interest in food taxes among policy makers	9
Choice of different types of food-related tax	10
Possible adverse effects of food taxes	11
How do we judge the effectiveness of a food tax?	12
What is the evidence base for the impact of food taxes?	13
Case studies of natural experiments from Denmark, France and Hungary	16
Case study: Denmark	16
Case study: France	19
Case study: Hungary	22
What can make a tax on food acceptable?	25
The place of fiscal measures among interventions to promote public health	25
Conclusions	26
Recommendations	27
Annex A: List of speakers	28
References	29

What is the role of health-related food duties? National Heart Forum 2012.

Acronyms

CAP	Common Agricultural Policy
DKK	Danish krone
EU	European Union
GBP	British pound sterling
NHF	National Heart Forum
SSSDs	Sugar-sweetened soft drinks
TFA	Trans fatty acids
US	United States
VAT	Value Added Tax
WHO	World Health Organization

Key points and summary of recommendations

This is a report of a meeting organised by the National Heart Forum (NHF) on 29 June 2012 on the role of food taxes in the context of addressing diet-related ill health including obesity. This meeting arose from the European Heart Health Strategy II project which has received co-funding from the European Union, in the framework of the Health Programme. It describes the key themes and issues that were raised by the presentations and discussions and identifies potential areas of further research. The NHF makes ten recommendations for potentially health-promoting policy directions for UK action.

1 The case for health-related food taxes

Increasing rates of diet-related chronic diseases, and widening disparities in rates of these diseases between rich and poor, call for a range of policy responses to address the problems created by a food supply dominated by cheap, energy-dense and heavily marketed, processed food and drinks.

In all EU countries, there are significant concerns about the dietary health of children and young people and about rising rates of overweight and obesity.

The costs of diet-related disease, which are borne by healthcare services and society, justify Government intervention.

Governments already use price supports to influence food prices and supply. VAT is already levied on foods and beverages, and the introduction of additional indirect taxes would be an adjustment of existing policy rather than a change of policy.

Recommendation 1: As a proportionate response to the current crisis in diet-related ill health, the application of additional taxes on foods known to be 'unhealthy' should be part of a package of public health policies.

2 The most promising types of tax instrument

Options available to policy makers in the UK include the reform of existing sales tax (VAT) and the introduction of specific excise duties.

Recommendation 2: Excise duties are the most promising option because they offer the maximum facility for flexibility, control and focus of the tax instrument.

Duties can be applied to a specific nutrient or combination of nutrients, or to a category of food or beverage.

Recommendation 3: Taxes applied to specific product categories, such as sugar-sweetened soft drinks (SSSDs)*, are straightforward to apply and are unlikely to have significant unintended effects.

3 The factors likely to influence effectiveness

Food consumption is relatively price elastic and the substitution of taxed goods with untaxed goods may impact on the type of food or range of nutrients consumed. (Price elasticity is the percentage change in the consumption of a good/s following a 1% increase in its price. Cross-price elasticities calculate the change in consumption of one product in response to a 1% change in the price of a related good.)

Recommendation 4: Price elasticity and cross-price elasticity effects must be carefully analysed to identify potential unintended effects.

The response of producers and retailers, in terms of their pricing policies, may either reduce or amplify the effect of a tax, depending on market conditions and how the tax is structured.

Recommendation 5: Duties on unhealthy foods are not likely to have substantial effects on changing consumption and supply patterns in isolation, but should be part of a comprehensive package of policy measures to shape food consumption and supply.

4 The impact of taxes on poorer consumers

Indirect taxes tend to be regressive in terms of the purchasing power of poorer consumers. However, the evidence from tobacco, alcohol and (although in a more limited way) food-related taxes is that the health gains are progressive because they benefit the poorest most.

Recommendation 6: Careful modelling of any new tax instruments is essential to understand how different types of consumers and businesses are likely to respond, and how combinations of taxes on unhealthy foods with subsidies on healthy foods could potentially achieve fiscally neutral policies.

Recommendation 7: Concerns about regressivity must be taken into account, but should not, by themselves, be seen as barriers to implementing taxes on foods.

5 The factors likely to influence public acceptability

The acceptability of a tax depends in part on its intended purpose – to alter consumption, to raise revenues or both.

Recommendation 8: Clear communication of the purpose of a tax and its potential benefits – including how revenues may be used to support health services or health programmes or

* Sugar-sweetened soft drinks (SSSDs) are here defined as non-alcoholic drinks served cold with added sugar.

What is the role of health-related food duties? National Heart Forum 2012.

to subsidise healthy foods – is crucially important, as it will determine public acceptance of the tax.

The term used to describe any tax instrument is likely to affect its acceptability to both the public and policy makers.

Recommendation 9: The term ‘health-related food duty’ is recommended as it conveys the health purpose of the policy and the notion of responsibility underpinning the payment of duties on goods that contribute to social harms.

In the current economic crisis there is increased interest and less political resistance among policy makers towards indirect taxes, including taxing commodities such as unhealthy foods and drinks in order to raise tax revenues for public health or for general purposes.

Recommendation 10: Any proposed statutory instrument should be introduced with a ‘sunset clause’ so that it is subject to regulatory review after a specified period of time.

Introduction

Purpose of this report

This is a report of a meeting organised by the National Heart Forum (NHF) on 29 June 2012 on the role of food taxes in the context of addressing diet-related ill health including obesity. It describes the key themes and issues that were raised by the presentations and discussions, identifies potential areas of further research and makes recommendations for potentially health-promoting policy directions for UK action. The recommendations are those of the National Heart Forum and do not necessarily reflect the views of the meeting participants or individual members.

About the meeting

The meeting was attended by members of the NHF and invited guests from academia, non-governmental organisations and Government departments. Speakers included fiscal and public health experts from the UK, Denmark, France, Hungary and international agencies (the World Health Organization and the European Public Health Alliance). A list of speakers is shown in Annex A.

This meeting arose from the European Heart Health Strategy II project which has received co-funding from the European Union, in the framework of the Health Programme. In November 2011 the European Heart Network released a scientific report on *Diet, Physical Activity and Cardiovascular Disease Prevention in Europe*¹, which reviews the evidence for action and identifies a range of potential policy options. In the report, the use of economic instruments – such as taxes and subsidies – is highlighted as an area of growing interest and debate. The dissemination of the report takes place in the framework of the EuroHeart II project. This project receives co-funding from the European Union in the framework of the Health Programme.

The public health rationale for food taxes

In the UK over 60% of adults are overweight or obese, and 20% of those adults are obese. This is contributing to a growing social and economic burden of chronic diseases including cardiovascular disease, cancer and type II diabetes. It is clear that rising rates of overweight and obesity are significantly driven by current patterns of food consumption – in particular, over-consumption of energy-dense processed foods and beverages high in fat, sugar or salt, and under-consumption of fruits and vegetables. These patterns of food consumption also underpin widening inequalities in health. WHO data for cardiovascular mortality rates in the European region show significant and persistent disparities in health both within and between countries in Europe.²

There is a range of potential policy responses to the crisis in diet-related health. These include education programmes, statutory and voluntary controls on food marketing to children, food reformulation, and nutritional information on food packaging. The application of taxes on foods known to be 'unhealthy' could be part of the package of policy responses – to influence consumption patterns and to raise revenues for health promotion purposes, including subsidies of foods known to be 'healthy'.

What is the role of health-related food duties? National Heart Forum 2012.

Governments have a justifiable role to intervene in markets to improve diets, both because there is evidence that people are poorly informed about healthy eating and receive partial information in the form of marketing messages, and because the extrinsic costs of diet-related ill health caused by the marketing of energy-dense foods and beverages are borne across society rather than by the companies responsible for those products.

Current interest in food taxes among policy makers

The use of fiscal measures to improve public health is clearly signalled in international and national policy commitments. At the UN High Level Meeting on the prevention and control of non-communicable diseases in September 2011, UN member states committed to: *'Advance the implementation of multisectoral, cost-effective, population-wide interventions in order to reduce the impact of the common non-communicable disease risk factors, namely tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol, through the implementation of relevant international agreements and strategies, and education, legislative, regulatory and fiscal measures, without prejudice to the right of sovereign Nations to determine and establish their taxation policies ...'*

The move towards 'health in all policies' within the European region (as part of the action plan for implementation of the European Strategy for the Prevention and Control of Noncommunicable Diseases 2012-2016)³, has led Member States to explore price measures irrespective of political views or level of economic development. Less developed countries have shown particular interest because the disease-related burdens place greater pressures on the economy and these countries need to tackle the problem using strategies that do not demand major investment.

In 2011, the UN Special Rapporteur on the Right to Food concluded that *'current food systems are deeply dysfunctional'* and added that: *'Governments have been focusing on increasing calorie availability, but they have often been indifferent to what kind of calories are on offer, at what price, to whom they are accessible, and how they are marketed.'* He included, among his recommendations for priority actions, that countries *'impose taxes on soft drinks (sodas), and on HFSS [high in fat, sugars and salt] foods, in order to subsidize access to fruits and vegetables and educational campaigns on healthy diets.'*⁴

Taxes on tobacco and alcohol are established policy measures in many countries and are included in the WHO analysis of 'best buys' to tackle non-communicable diseases.⁵ Health-related food taxes could in future be included in this analysis when the evidence (from natural experiments) is more developed.

A range of different taxes on foods have been introduced in a number of countries in recent years, for both public health and fiscal revenue-raising purposes. With the current economic crisis, the budget deficit and the reluctance to increase income taxes, there is likely to be increased interest in taxing commodities such as unhealthy foods. The International Monetary Fund has for some time encouraged increases in indirect taxes, specifically VAT, rather than direct (income) taxes.⁶

David Cameron said, in October 2011, that in the light of the obesity epidemic and the burden this placed on health services, food taxes were something that the UK Government should look at: *'Don't rule anything out, but let's look at the evidence and let's look at the impact on families,'* he said.⁷

The importance of terminology

Discussions have referred variously to 'fat taxes', 'sin taxes', 'health-related food taxes', 'duties', and 'levies'. It is important to get the terminology right because different terms carry different significance and some terms can be misleading as to the nature and purpose of the economic instrument described. Dr Mike Rayner and colleagues use the term 'health-related food tax' to mean 'any tax levied at a higher rate on food items considered unhealthy'. This suggests a focus wider than just obesity, and the possibility of targeting different nutrients or parts of the diet to maximise overall health gains.⁸ The term 'food duties' might be more acceptable than 'food taxes'.

Choice of different types of food-related tax

Whether the purpose of a tax is to influence consumption patterns or to raise Treasury revenues, or both, will influence the type and level of the tax levied.

Sales taxes

Foods sold in the UK are already subject to Value Added Tax (VAT) – a sales tax. Although most food is zero-rated for VAT, some luxury food items, such as ice-cream and confectionery, as well as all food supplied in cafés and restaurants, and hot take-away food, attract VAT at the standard rate. However, the current application of VAT does not follow any nutritional logic. For example, there is no alignment between the way in which VAT is currently applied and how healthy the foods are (as categorised, for example, by the nutrient profiling model used by Ofcom to determine foods which may be advertised on children's TV in the UK⁹).

Excise duties

Excise duties are taxes tailored to particular groups of products including tobacco, alcohol and petrol, and set at levels higher than general sales taxes. They may be levied on a certain volume or weight of goods (specific tax) or on their value (*ad valorem* tax). Food-related excise duties can be applied in a number of ways:

- as a tax on a specific nutrient, such as saturated fat or sugar
- as a tax on a combination of nutrients using nutrient profiling¹⁰, or
- as a tax on a category of food or beverage, such as sugar-sweetened soft drinks.

Most current examples of food taxation in other European countries are specific excise duties as these give the maximum facility for flexibility, control and focus of the tax instrument. Specific excise duties do not change if the producer reduces prices and they increase proportionately to the volume or quantity purchased. Also, the revenues from excise duties can be more easily identified and set aside for public health purposes than those from VAT adjustments.

Some examples of health-related food taxes are shown in Table 1. In addition, it is reported that legislators in Nova Scotia, Canada, are currently considering a tax on unhealthy foods to subsidise healthy foods. The Government in Fiji has recently removed some of their food taxes and is considering a more significant tax on soft drinks.

What is the role of health-related food duties? National Heart Forum 2012.

Table 1: Examples of health-related food taxes (as of October 2012)

Country	Date introduced	Foods taxed	Tax rate
US	Various	Sugar-sweetened soft drinks in 23 states (SSSDs <i>and</i> other foods in 35 states)	1-8%
Norway	1981	Sugar, chocolate, and sugary drinks	Variable
Samoa	1984	Soft drinks	0.40 tala/L (£0.11; €0.14; \$0.18)
French Polynesia	2002	Sweetened drinks, confectionery, and ice-cream	60 francs/L (£0.41; €0.55; \$0.66) for imported drinks
Fiji	2006	Soft drinks	5% on imported drinks
Nauru	2007	Sugar, confectionery, carbonated drinks, cordial, and flavoured milks	30% import levy
Finland	2011	Soft drinks and confectionery	Soft drinks €0.075/L (£0.06; \$0.10); confectionery €0.75/kg
Hungary	2011	Foods high in sugar, fat or salt, and sugary drinks	10 forint (£0.03; €0.04; \$0.05) per item
Denmark	2011	Products with more than 2.3% of saturated fat: meat, dairy products, animal fats, and oils	Kr16/kg (£1.76; €2.15; \$2.84) of saturated fat
France	2012	Drinks containing added sugar or sweetener	€0.72/L

Source: Based on Mytton et al, 2012¹¹.

Possible adverse effects of food taxes

When considering how and where to apply taxes, it is necessary to consider possible adverse effects on health and on household budgets.

A nutrient-based tax may have the unintended effect of shifting consumption towards other less healthy nutrients (for example, from higher saturated fat products to higher salt products). Substitution effects may be less problematic with category-specific taxes. For example, a tax on sugar-sweetened soft drinks is likely to shift consumption towards generally healthier alternatives.

Experience suggests that consumers are more likely to substitute taxed products with close alternatives than switch between food groups. For example, a tax on full-cream milk is more likely to lead to a switch to semi-skimmed milk rather than to a non-dairy product.

Impacts on poorer consumers

A major concern is the regressive effect of consumption taxes on poorer households who spend a greater proportion of their income on food than households with higher incomes. An effect of new food taxes could be to disproportionately tax poorer families. If a consumer does not respond to a

What is the role of health-related food duties? National Heart Forum 2012.

tax signal by buying less or switching to cheaper non-taxed alternatives, they may pay more for their food.

Even if people respond to a tax signal and switch from taxed foods to cheaper, untaxed foods, they may still pay more overall for food. This would be mitigated if taxes were linked to subsidies on healthier foods to ensure these are more affordable.

On the other hand, as people on lower incomes generally consume poorer diets and suffer a higher incidence of diet-related disease from earlier in life, the potential health gains from even marginal changes in dietary intakes in this population group may be significant. In other words, the health gains are likely to be progressive since they benefit the poorest most, and may narrow inequalities in health.

We do not yet have sufficient data from the natural experiments discussed at the NHF meeting to show whether or how these taxes may have regressive effects. It was suggested that the concern expressed by policy makers on the issue of equity varies from country to country. (See the case studies on page 16.)

Impacts on businesses

For the three case studies discussed at the meeting – France, Denmark and Hungary (see page 16) – negative impacts on food businesses were reported only in Hungary, where some companies have argued that the tax effect has made it necessary to cut jobs. However, it may be difficult to separate the effect of the tax from wider consequences of the economic crisis.

How do we judge the effectiveness of a food tax?

The effectiveness of a tax depends on:

- the purpose of the tax (altering consumption, raising revenue, or both)
- which goods are subject to tax
- how effective the tax is at changing the price
- how the tax is passed on in the retail price, and
- how people's consumption responds to price changes.

What is the evidence base for the impact of food taxes?

The available evidence falls into four categories:

- indirect evidence from studies on tobacco and alcohol duties
- direct evidence from natural experiments
- modelling studies, and
- controlled experiments (experiments conducted in closed and simulated environments).

An important key to understanding the likely impacts on consumer responses to a tax is what sort of price elasticities apply to different foods across different socio-economic groups. Price elasticity is calculated as the percentage change in the consumption of a good/s following a 1% increase in its price. Cross-price elasticities calculate the change in consumption of one product in response to a 1% change in the price of a related good.

Studies on tobacco and alcohol duties

There is well-documented evidence that, as tobacco and alcohol prices are raised by duty increases, so overall consumption decreases. There is substantial evidence from a very large body of international literature that price is a major determinant of demand for cigarettes, with an average price elasticity of demand of about -0.25 to -0.5, clustering at around -0.4 for Europe and US, and an average income elasticity of demand of about 0.3 to 0.4. Increases in tax are shown to result in increases in national tax revenues, and in Europe surveys have revealed general support for significant increases in tax, particularly when revenues are allocated to tobacco control or other public health measures. Tax increases have been shown to particularly reduce demand from lower-income groups and young people.^{12, 13}

For the UK, the median estimate of price elasticity of demand for alcohol is estimated as -0.4 for beer, -0.9 for wine and -0.7 for spirits. Estimates for all countries are similar, but recent estimates by HMRC are -1.1, -0.5 and -0.9 respectively for retail and -0.8, -0.5 and -1.1 for on-trade.¹⁴ These studies and reviews show consistently that alcohol and tobacco duties result in reduced consumption of these products together with increased tax revenues.

Natural experiments

Examples of food taxes operating in the real world can provide the most convincing evidence of their effect. Details of natural experiments in Denmark, France and Hungary are described and discussed on pages 16 to 24. Other studies have looked at the effect of soft drink taxes at state level in the US and in Ireland. The two US studies examined the health effects of soft drink taxes levied at between 1% and 8%. Neither study found a significant association between taxes and the prevalence of obesity at state level, and it may be that the tax rate was too low and the period of the studies too short, to observe an effect on population health.¹⁵ An analysis of the Irish experience in the 1980s and 1990s suggested a price elasticity of demand for soft drinks of -1.1 and that, when the price of soft drinks fell due to the abolition of a special soft drink tax, there was an increase in consumption and a fall in tax revenue.¹⁶

Modelling studies

Modelling studies use economic data (price elasticity measures) to predict how price changes will affect consumption and dietary intake, and can take into account possible substitution effects. Modelling of taxes on sugar-sweetened soft drinks in the US predict a reduction in calorie intake of up to 50kcal per day for a 20% sales tax, which would deliver meaningful health gains with little risk of adverse substitution behaviour.^{17, 18}

Other modelling studies of taxes on unhealthy foods present a more complicated picture. Some suggest the taxes would lead to small changes in nutrient intake but generally to meaningful health gains with a reduction in the incidence of cardiovascular disease ranging from 1-3%.^{19, 20, 21}

Modelling case study presented by Professor Richard Tiffin

Professor Richard Tiffin from the Centre for Food Security at the University of Reading reported the findings of a study modelling the impacts of a 1% tax on the retail price for every percentage point of saturated fat in that food (up to a maximum of 15%), assuming also a subsidy of 27% on fruit and vegetables to make the modelled policy fiscally neutral.²²

It was estimated that the modelled tax would raise the price of milk and cream by 1.82%, beef by 6.28% and cheese by 15%. Based on the assumptions within this model, the tax could produce some marginally negative dietary effects:

- reduced intake of protein (due to the increased cost of meat and dairy produce)²³, and
- reduced intake of fat-soluble vitamins (D and E) and of vitamin B₁₂.

Overall, Professor Tiffin concluded that the impact of this fiscal policy would be marginal and would not change the relative risk of disease across the population by very much, and would not impact on obesity. When the effects of the modelled tax on different socio-economic groups were examined, it seemed that the tax had little impact on diet-related ill health. The tax would have a regressive effect as the price impact would be greater on poorer consumers.

It was noted in the meeting that the 5% reduction in cardiovascular disease incidence modelled would equate to significant health gains and represented around 9,000 lives saved²⁴ and that this was more likely to benefit poorer consumers (whose disease risk is greater) than higher income groups. It was also noted that this model did not assume differences in price elasticity by socio-economic group (which are known to exist for tobacco expenditure) and that this might affect the modelled impacts of the tax on inequalities and regressivity.

Controlled experiments

Seven studies have been carried out in closed or simulated environments. One study reported that a 35% sales tax on sugar-sweetened soft drinks in a canteen led to a 26% decline in sales, although these findings should be treated with caution as they did not take into account possible compensatory behaviour – for example, customers buying more drinks outside the controlled environment.

Current knowledge about the effectiveness of food taxes based on the body of direct evidence from these three sources – natural experiments, modelling studies and experiments in controlled environments – is summarised in Table 2.

Table 2: Assessment of effectiveness of food taxes from direct evidence

	Beneficial?	Limitations
Natural experiments	Little benefit	Low tax level; few studies
Modelling studies	Likely beneficial	Validity uncertain; assumption-based
Experiments in controlled environments	Beneficial	Poor external validity

Understanding the potential responses of producers and retailers

The response of producers and retailers to taxes on goods is complex and varies according to the type of tax levied. Understanding their response in terms of pricing policies is vital in determining the effect of a tax and needs to take account of the structure of the tax, the portfolio of products produced or sold, and the intensity of competition between firms in that category. In some instances, companies may seek to absorb small taxes rather than pass the price increase on to their customers. In other situations, they may adopt a profit-maximising response that reinforces the impact of the tax on consumers instead of negating it. An example of this response is described in the Danish case study on the next page and has also been shown for the UK tobacco market.²⁵

Case studies of natural experiments from Denmark, France and Hungary

CASE STUDY: DENMARK

Professor Jørgen Dejmård Jensen, an economist and associate professor at the Institute of Food and Resource Economics at the University of Copenhagen, presented a review of policies in Denmark.

The current health-related food taxes in Denmark were introduced principally to raise revenue, but against a background of increasing concern about diet-related chronic diseases over the last 20 years. In 2003 a ban on trans fatty acids (TFAs) was introduced in Denmark. Under a general tax reform agreed in the Danish Parliament in 2010, existing taxes on a number of goods were increased, including the taxes on sugar products (an increase in tax of €0.48 per kilo), ice-cream (€0.11 per kilo) and sugar-sweetened soft drinks (€0.04 per litre), whereas the tax on artificially sweetened soft drinks was lowered (€0.04 per litre).

In addition, a new **nutrient-based tax on foods with a saturated fat content greater than 2.3g per 100g** was introduced, applying to meat, dairy products (excluding drinking milk), animal fats, edible oils and fats, margarine and spreadable blended fats.

In price terms, the tax raised the cost of a 250g pack of butter by 20%. The actual price increases on meat products are small, adding about €0.12 cents to a kilo of minced beef.

How is the tax levied?

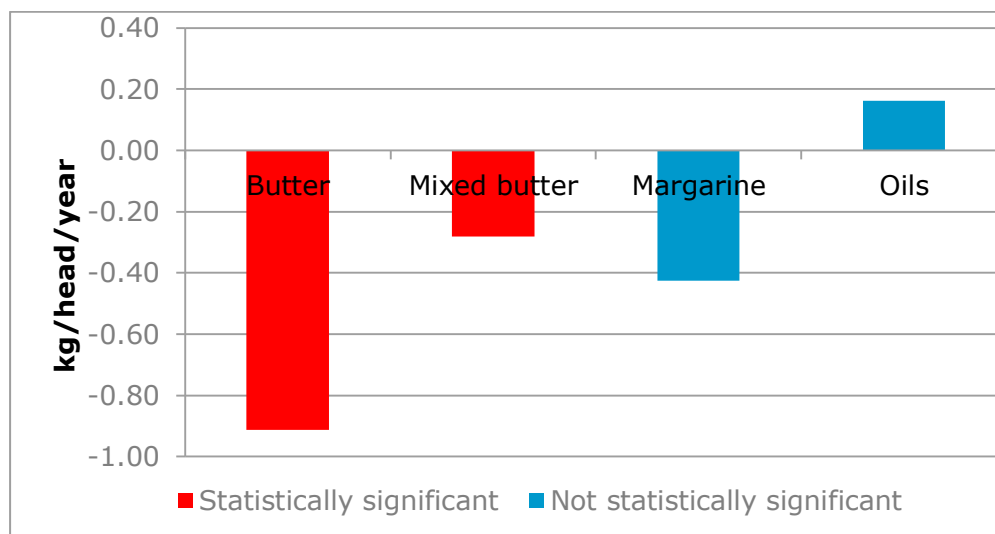
The tax is levied on commercial producers within Denmark and by importers of food for consumption within Denmark. Food produced for export and small producers (with a turnover of less than €7,000 per year) are exempt.

One of the challenges has been how to calculate the appropriate level of tax on meat – whether by cut or by carcass. Three options are available for the producers: using specific documented content of saturated fat, using publicly available food composition data, or using standard coefficients on animal-specific average saturated fat content.

What is the reported estimated effect of the saturated fat tax in Denmark?

Based on household expenditure data and econometric analysis comparing purchasing and prices before and after the tax, preliminary analysis suggests that consumption of butter and mixed butter products has decreased. See Figure 1.

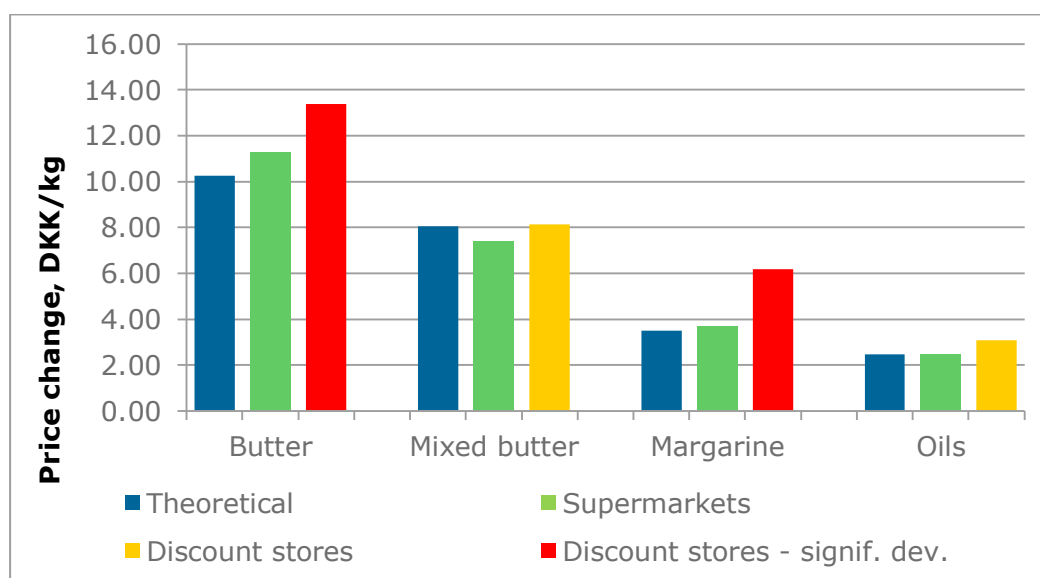
Figure 1: Effect of Denmark’s fat tax on consumption of fat and oils – preliminary estimates



Source: Jensen, 2012²⁶.

The effect the tax has had on prices presents a mixed picture. Supermarkets have responded with price structures as predicted, by passing on the tax. Discount stores, on the other hand, raised prices significantly above the tax (see Figure 2). This is an example of the profit-maximising response referred to earlier.

Figure 2: Change in fat product prices in Denmark post-tax



Source: Jensen, 2012.²⁷

What is the role of health-related food duties? National Heart Forum 2012.

No analysis has been undertaken of the tax effects on goods other than those that attract the tax, but the tax has opened a window of opportunity for retailers to restructure their price setting, product sizing and marketing strategies.

The tax is estimated to generate annual revenues for the Danish Government of around DKK1.5 billion (£160 million). Introduced mainly for the purpose of raising revenue rather than for public health reasons, the tax has been successful in its primary objectives, but Professor Jensen cautioned that it is too early to draw clear conclusions about the overall effects of the tax.

How has industry reacted to the tax?

Food producers and retailers have argued that they face administrative costs due to the tax. They have also claimed losses in sales and jobs due to cross-border trade as Danes reportedly cross the border into Germany to stock up on untaxed goods. The Danish Ministry of Taxation reports that the extent of cross-border trade due to the tax has not been dramatic.

What are the views of the Danish public?

Industry-funded research among consumers suggests that around 40% of those surveyed favoured the confectionery tax, but only 20% supported the tax on goods containing saturated fat.

Generally it is felt that food taxes are unpopular and that effective communication of the purpose and better visibility for the gains are needed to ensure that future tax reform does not undo existing provisions nor undermine planned proposals to broaden the tax base for sugar taxation to more products.

At the time of printing this report, it has been announced that the Danish government intends to abolish the saturated fat tax under the budget agreement for 2013.

What is the role of health-related food duties? National Heart Forum 2012.

CASE STUDY: FRANCE

Dr Michel Chauliac, a public health physician who leads the French National Nutrition and Health Programme at the Ministry of Health, presented a review of policies in France.

Under French finance law, a new tax on soft drinks was introduced with effect from January 2012.²⁸ It applies to both sugar-sweetened and 'diet' soft drinks. The intended purpose of the tax is to raise revenues, with half of the revenues to be allocated to support National Social Health Insurance and half to general purposes.

The introduction of the tax followed intense parliamentary debate and an appeal to the Constitutional Council before it was agreed.

Although the stated purpose of the tax is to raise revenues, Dr Chauliac outlined how the policy is congruent with objectives of the French National Nutrition and Health Programme (2011-2015) which include reducing the prevalence of overweight and obesity among children and adolescents and reducing inequalities in overweight and obesity. The Programme also includes nutritional objectives over five years: to increase the proportion of people consuming less than 12.5% of daily energy intake from sugary foods, and to reduce the proportion of children drinking more than one glass of sugary drinks per day by at least 25%.

French consumption data show that beer and wine consumption has been declining slightly, but consumption of both diet and sugar-sweetened soft drinks, although low compared to other countries, has been increasing.

It was noted that under French law it would have been difficult to introduce a nutrient-based tax and this also influenced the decision to introduce a category-based tax.

How is the tax levied?

The tax is levied on drinks manufacturers established in France, importers of drinks, and those making intra-EU acquisitions in France. It is also payable by food service outlets which serve their own prepared drinks with added sugar.

The tax is calculated by volume and is levied at €7.16 per hectolitre (£5.66/hectolitre).

What is the expected impact of the tax?

When the level of tax was announced in 2011, researchers at the Toulouse School of Economics conducted econometric modelling to assess the likely impact of the tax. Table 3 shows the expected changes in price, changes in soft drink consumption and changes in sugar consumed in soft drinks. Figures in the left-hand columns show the likely effects of the tax if it were applied to sugar-sweetened soft drinks only, as the tax was originally proposed. Figures in the right-hand columns show the effects of the tax as it was actually applied to all soft drinks (including sugar-free soft drinks) after it was decided not to present the tax as an 'obesity tax' following objections from the French food industry.²⁹

Initial findings are that the greatest price increases have been on the cheapest, own-brand drinks. The impact on low-income consumers is not yet known. Data published after the NHF meeting by

What is the role of health-related food duties? National Heart Forum 2012.

industry analysts Symphony IRI suggest that soft drinks sales fell by 3.3% between 1 January and 31 May 2012 following a 5% increase in soft drink prices in January (double the increase seen in other food prices).³⁰

Table 3: Econometric modelling of the impact of the tax on consumption of soft drinks using data from 2003-2005 (excluding drinks purchased for consumption outside the home)

	Tax on drinks with added sugars only			Tax on all soft drinks		
	Change in price %	Change in consumption (litres per person per year)	Change in consumption of added sugar (grams per person per year)	Change in price %	Change in consumption (litres per person per year)	Change in consumption of added sugar (grams per person per year)
Drinks with added sugars	12.7	-4.1	-242	12.1	-3.0	-131
National brands	9.4	-2.5	-150	8.6	-1.5	-53
Retailer brands	19	-1.6	-92	18.9	-1.5	-78
Drinks with sweeteners	-1.7	+1.2		1.2	-0.4	
Total	8.7	-2.9	-242	11	-3.4	-131

Source: Bonnet and Réquillart, 2012.³¹

Further research by the Toulouse School of Economics is looking at the effects of the soft drinks tax to assess:

- the impact on consumption levels and how this may affect nutritional objectives
- the impact on the purchasing behaviour of consumers, including price sensitivity, the value consumers attach to brands and product features and any substitution behaviour, and
- the strategic responses of producers and retailers to the tax.

A study of public perceptions and other impacts of the tax are planned after 12 months and will consider:

- price changes
- consumption patterns among 'heavy consumers'

What is the role of health-related food duties? National Heart Forum 2012.

- consumption patterns among children
- differences by socio-economic group
- possible substitution of other sweet products for soft drinks
- changes in product formulation, and
- whether the tax is perceived by the public as a 'signal' or health warning for avoiding products.

What are the views of the French public?

Initial observations of public reaction suggest that people in France generally accept that soft drinks are not a healthy option and do not question the tax.

How has industry reacted to the tax?

In protest at the announcement of plans for the tax, Coca-Cola Enterprises briefly suspended plans for the expansion of its bottling facility in Bouches-du-Rhône, reportedly saying that the tax 'sanctions our business and stigmatises our products.'³² The company reversed this decision shortly afterwards, preferring to be viewed as a good corporate citizen, but the industry as a whole objected to any suggestion that the tax was based on public health grounds rather than revenue-raising grounds. The Government agreed not to refer to public health as a motivation for the tax and widened the scope of the tax to include all soft drinks irrespective of their sugar content.

What is the role of health-related food duties? National Heart Forum 2012.

CASE STUDY: HUNGARY

Dr András Nagy, president of the Hungarian Heart Foundation and head of the department of cardiology at Kecskemet Hospital in Hungary, presented an overview of the food taxes in Hungary.

As background, Dr Nagy outlined the diet-related health problems and consumption patterns underpinning the current policies. Around two-thirds of the adult population in Hungary are overweight or obese as are around 20% of boys and 25% of girls aged 7 years. Hungary has the highest average salt consumption per capita in the world³³ and the average daily soft drink intake among adults is 290ml per day.³⁴ Young people between 18 and 34 are getting on average 7% of their daily energy from soft drinks.³⁵

The political background is one of limited resources for the Ministry of Health, low wages in the health sector, a tradition of 'unorthodox' Government fiscal policies and a Government willingness to regulate multinational companies as necessary.

In September 2011, the Public Health Product Tax was introduced as an indirect tax on pre-packed products in categories where healthy alternatives are available. The categories are sugar-sweetened soft drinks, energy drinks, confectionery, salted savoury snacks and condiments. Flavoured beers and alcopops and sugary jams were added in 2012. The tax was originally applied to fast food, potato crisps (chips) and bakery products, earning it the 'chips tax' name, but manufacturers successfully lobbied for exemptions in some of these categories.

The explicit aims of the tax are to promote healthier consumption patterns and to stimulate reformulation of products by taxing products that are considered to carry risks to health when over-consumed, and using the revenues raised for health promotion purposes.

How is the tax levied?

The rate at which the tax is levied is shown in Table 4 on the next page. For comparison, the soft drinks tax is levied at around half the rate of the French soft drinks tax, perhaps reflecting a population with less purchasing power in Hungary compared to France.

The tax is payable by weight or volume on products produced in Hungary for the domestic market by manufacturers, and on imported products by the first domestic seller (whether or not this is to the final consumer).

What is the role of health-related food duties? National Heart Forum 2012.

Table 4: Rate of tax applied to foods in Hungary

Rates are shown in Hungarian forints and GBP.

Category	From September 2011	From January 2012
Soft drinks	Added sugar: more than 8g/100ml 5 Ft/litre (1.4p/l)	Syrups or concentrates for soft drinks 200 Ft/l (54p/l) Other soft drinks 7 Ft/l (1.9p/l) Drinks with more than 25% fruit content exempted.
Energy drinks	Added caffeine: more than 10mg/100ml 250 Ft/l (68p/l)	Methylxanthines content: more than 1mg/100ml Taurine: more than 100mg/100ml
Confectionery	Added sugar: more than 25g/100g Chocolate: more than 40g/100g 100 Ft/kg (27p/kg)	Added and total sugar: more than 25g/100g Chocolate: added and total sugar more than 40g/100g and cocoa content less than 40g/100g 70 Ft/kg – sweetened cocoa powder (19p/kg) 130 Ft/kg all other products (36p/kg)
Salty snacks	Salt: more than 1g/100g 200 Ft/kg (54p/kg)	250 Ft/kg (68p/kg)
Condiments	Salt: more than 5g/100g (exemptions for mustard and ketchup) 200 Ft/kg (54p/kg)	250 Ft/kg (68p/kg)
Flavoured beers/alcopops		Beer or any other alcohol with added sugar that has a total sugar content of more than 5g/100ml: 20 Ft/l (5.4p/l)
Fruit jam		All fruit flavours except extra jam, extra jelly, marmalade and special quality jams: 500 Ft/kg (£1.37/kg)

What is the reported impact of the tax?

Industry data suggest a drop in sales for salted snacks (33% decrease in the first six months), and for soft drinks (from 117 million litres sold in the last quarter of 2011 to 69 million litres in the first quarter of 2012). It was noted that decreases in consumption in these categories were likely to be partly attributable to the general economic crisis in Hungary. Extra purchases and stockpiling of goods ahead of the introduction of the tax also meant that the exact impact of the tax is difficult to measure.

Government revenues from the tax have been far lower than forecast, with less than 25% of the expected revenue actually raised in the first four months of 2012. The majority of the tax raised was

What is the role of health-related food duties? National Heart Forum 2012.

on confectionery products. Dr Nagy suggested that a degree of tax evasion was thought likely to explain in part the gap between forecast and actual tax collections.

It appears that in the energy drinks category, manufacturers have reformulated products to replace caffeine with theobromin and mate tea, and to replace sugar with sweeteners, in order to avoid the tax. Tax authority data show that average monthly tax volumes in this category dropped from 37 million Ft (£103,000) in 2011 to 21 million Ft (£58,000) in 2012. It was noted that these ingredient substitutions are not necessarily 'healthy' changes.

In other categories, there are mixed but limited data for reformulation. For example, it appears that reducing salt to get under the tax threshold has proved possible for salted nuts, but not for potato crisps.

Overall, in the absence of detailed monitoring, there are observed effects indicating changes in product formulation and consumer behaviour.

How has industry publicly reacted to the tax?

Industry reaction to the tax has been extremely critical, with companies arguing that the effects on consumption and health are marginal; that Hungarian intakes of the taxed product categories, such as salty snacks, are relatively low compared to other EU countries and the US and therefore unwarranted; and that the tax is unfair as it discriminates between product categories. Companies also reason that any revenues gained by the 'chips tax' must be weighed against losses in VAT income and the welfare costs arising from job losses in the food industry.

What has been the reaction in the media and among the public?

Industry-funded surveys suggest that the 'chips tax' is poorly supported and that awareness of the health rationale is low. Consumers generally view the tax as a revenue-raising tax rather than as a public health instrument. They are concerned about the effect on the price of foods and are sceptical about whether the tax will generate the intended revenues. Dr Nagy pointed out that in Hungary there is no strong voice from public health or consumer non-governmental organisations to provide any counter-argument or supportive messaging about the potential health effects of the tax, making the public discourse one-sided.

Dr Nagy said that the potential regressive effect of the tax on poorer consumers had not in practice been a political issue for the Hungarian Government. It was suggested that this might be because, in the current economic climate, 'all Hungarians have bigger problems to worry about'.

What can make a tax on food acceptable?

Public views on the acceptability of food taxes can vary widely but support is generally greater when the health benefits are emphasised³⁶ and is likely to be influenced by the use of tax revenues for health-related purposes. Taxes could be used to fund public health interventions or subsidise healthy foods such as fruit and vegetables, for example, just as tobacco taxes can be ear-marked to support services to help smokers stop smoking.

It has been estimated by Sustain – the alliance for better food and farming – that a UK tax on sugar-sweetened soft drinks of 20p/litre would raise as much as £1.1 billion a year³⁷, which could be used to pay for programmes that would improve children’s health, such as the universal provision of free school meals.

Taxes on products, such as sugar-sweetened soft drinks, that are not considered to be essential or a healthy option are more likely to be supported. Moreover, since a tax on sugar-sweetened soft drinks is likely to reduce children’s and young people’s consumption, this may be viewed as helpful in supporting parental efforts to limit their consumption.

Balancing taxes with subsidies and investing revenues in public health measures can also help address concerns about the regressive impacts of taxes on poorer consumers. While it is acknowledged that food taxes *are* regressive, this should not distract attention from the potential for progressive health gains for poorer groups. It is a logic that helps to justify existing tobacco and alcohol taxes. To reject food taxes simply on the principle that they are regressive risks abandoning a potentially powerful policy for tackling health inequalities. Current thinking among many policy makers is that this issue should not be a reason against proceeding with food taxes, but that any approach must be evaluated carefully to assess the benefits and disadvantages.

The framing and description of a tax instrument is important, including the terminology used and communication of the purpose and benefits to the public and to local and national public health professionals whose support is crucial, just as it has been for securing smoke-free legislation and tobacco taxes in the UK. Social marketing could help improve public understanding and acceptance of a new health-related food tax, just as public information campaigns in the 1970s highlighting safety issues prepared the ground for the compulsory wearing of seat-belts in cars.

The place of fiscal measures among interventions to promote public health

There was a consensus at the NHF meeting that, on their own, food taxes will not solve the problems of diet-related ill health. They should be considered as part of a ‘basket of measures’ available to policy makers to shape markets in the public interest and to mend a failing food system which currently makes highly processed foods laden with fat, sugars or salt cheaper, more accessible and more heavily promoted than are healthy foods. In Europe, the Common Agricultural Policy (CAP) and VAT on food currently serve to distort food production and prices in ways that undermine public

What is the role of health-related food duties? National Heart Forum 2012.

health. Future policy measures must seek to achieve a rebalancing of the CAP – shifting subsidies and other production incentives towards healthy foods, such as fruit and vegetables, and away from sugar, meat and dairy production – and VAT adjustments, so that taxes apply to less healthy, processed foods.

Health-related food taxes may also have a symbolic value that goes beyond their direct effect on price – signalling foods which should be generally avoided. This in turn may influence food industry decisions about categories to develop, withdraw or reformulate for their portfolio.

Other fiscal approaches might be considered which target producers rather than consumers. These could include taxes levied on the production processes for ultra-processed foods and beverages, or changing the tax-deductible status of marketing activities by companies producing these products.

Conclusions

Food taxes are currently at the centre of a vigorous policy debate in many countries around the world where policy makers, academics, public interest organisations and food companies face the dual challenges of rising rates of chronic disease caused by poor dietary health, and the economic crisis. In recent years a number of countries have introduced different food taxes for both public health and revenue-raising purposes, and these provide ‘natural experiments’ which inform our understanding about the impact and effects of such taxes. Because these taxes are relatively recent we do not yet have a full picture of their effects and they should be considered as one part of the evidence base alongside evidence from modelling studies, experiments in controlled environments and transferable learning from experience with tobacco and alcohol taxation.

The factors that determine whether a food tax will be effective – either to raise revenues or change consumption patterns, or both – are inter-related and include the efficacy with which the tax is applied, the pricing response of producers and retailers, and the purchasing response of consumers themselves. All of these factors must be taken into account by policy makers when developing new tax instruments.

An important issue for policy makers to consider is the likely effect of a tax on poorer consumers. Indirect taxes tend to be regressive on poorer households, and such households spend a greater proportion of their income on food. On the other hand, evidence from tobacco and alcohol taxation shows that health gains among poorer groups are progressive because the health impacts of smoking and excess drinking affect these groups disproportionately. In the same way, health-related food taxes are likely to yield progressive health gains because people on lower incomes generally consume poorer diets and suffer higher rates of diet-related disease.

Of the different tax instruments available to policy makers, those that apply to a specific category of food or beverage offer greatest control and focus and are likely to be more straightforward to apply and to have fewer unintended effects. Nutrient-based taxes, such as the Danish tax on saturated fat, may shift consumption from one unhealthy nutrient (saturated fat) to another (salt), for example. A tax on sugar-sweetened soft drinks on the other hand is likely to shift consumption towards generally healthier alternatives.

What is the role of health-related food duties? National Heart Forum 2012.

Public reaction to food taxes reported in the examples discussed here is mixed. Generally speaking, the support is greater when the health benefits are emphasised and the revenues raised are used for health-related purposes. Taxes are more likely to be publicly acceptable if they are levied on products that are not considered to be essential or where there is a healthy alternative, so that the tax policy is aligned with public health messages and other supporting public health policies.

Recommendations

- 1 As a proportionate response to the current crisis in diet-related ill health, the application of additional taxes on foods known to be 'unhealthy' should be part of a package of public health policies.**
- 2 Excise duties are the most promising option because they offer the maximum flexibility for control and focus of the tax instrument.**
- 3 Taxes applied to specific product categories, such as sugar-sweetened soft drinks (SSSDs), are straightforward to apply and are unlikely to have significant unintended effects.**
- 4 Price elasticity and cross-price elasticity effects must be carefully analysed to identify potential unintended effects.**
- 5 Duties on unhealthy foods are not likely to have substantial effects on changing consumption and supply patterns in isolation, but should be part of a comprehensive package of policy measures to shape food consumption and supply.**
- 6 Careful modelling of any new tax instruments is essential to understand how different types of consumers and businesses are likely to respond, and how combinations of taxes on unhealthy foods with subsidies on healthy foods could potentially achieve fiscally neutral policies.**
- 7 Concerns about regressivity must be taken into account, but should not, by themselves, be seen as barriers to implementing taxes on foods.**
- 8 Clear communication of the purpose of a tax and its potential benefits – including how revenues may be used to support health services or health programmes or to subsidise healthy foods – is crucially important, as it will determine public acceptance of the tax.**
- 9 The term 'health-related food duty' is recommended as it conveys the health purpose of the policy and the notion of responsibility underpinning the payment of duties on goods that contribute to social harms.**
- 10 Any proposed statutory instrument should be introduced with a 'sunset clause' so that it is subject to regulatory review after a specified period of time.**

Annex A List of speakers

Invited speakers at the NHF meeting were:

Dr João Breda, programme manager for nutrition, physical activity and obesity in the division of non-communicable diseases and health promotion at WHO Regional Office for Europe.

Dr Michel Chauliac, public health physician responsible for the French National Nutrition and Health Programme at the Ministry of Health.

Robin Ireland, chief executive officer of Heart of Mersey.

Professor Jørgen Dejgård Jensen, associate professor at the Institute of Food and Resource Economics at the University of Copenhagen.

Monika Kosinska, secretary general of the European Public Health Alliance.

Dr András Nagy, president of the Hungarian Heart Foundation and head of department of cardiology at the Kecskemet Hospital in Hungary.

Martin O'Connell, senior research economist at the Institute for Fiscal Studies.

Charlie Powell, campaigns director at Sustain, the alliance for better food and farming.

Dr Mike Rayner, director of the British Heart Foundation Health Promotion Research Group.

Professor Richard Tiffin, director of the Centre for Food Security at the University of Reading.

The meeting was chaired by **Professor Joy Townsend**, trustee of the National Heart Forum and emeritus professor of economics, epidemiology and health systems research at the London School of Hygiene and Tropical Medicine.

References

- 1 European Heart Network. 2011. *Diet, Physical Activity and Cardiovascular Disease Prevention in Europe*. Brussels: European Heart Network.
- 2 WHO Health for All Database.
- 3 Galea G. 2011. *Action Plan for Implementation of the European Strategy for the Prevention and Control of Noncommunicable Diseases 2012-2016*. Geneva: World Health Organization.
- 4 United Nations. 2011. *Report of the Special Rapporteur on the Right to Food, Olivier de Schutter. December 2011. A/HRC/19/59*
- 5 World Health Organization. 2010. *Global Status Report on Noncommunicable Diseases*. Geneva: WHO.
- 6 International Monetary Fund. 2011. *Revenue Mobilization in Developing Countries*. Washington: International Monetary Fund.
- 7 www.guardian.co.uk/politics/2011/oct/04/uk-obesity-tax-david-cameron
- 8 Mytton OT, Clarke D, Rayner M. 2012. Taxing unhealthy food and drinks to improve health. *British Medical Journal*; 344; e2931.
- 9 Rayner M et al. 2005. *WXYfm Model*. 2005. London: Food Standards Agency.
- 10 Nutrient profiling is 'The science of classifying or ranking foods according to their nutritional composition for reasons related to preventing disease and promoting health'. Source: World Health Organization (In press.) *Guiding Principles and Framework Manual for the Development or Adaptation of Nutrient Profile Models*.
- 11 Mytton OT, Clarke D, Rayner M. 2012. Taxing unhealthy food and drinks to improve health. *British Medical Journal*; 344: e2931.
- 12 PPACTE Consortium. 2012. Policy recommendation for tobacco taxation in the European Union: integrated findings from the PPACTE project (Pricing policies and control of tobacco in Europe). Dublin: PPACTE Consortium.
- 13 Chaloupka F, Yurekli A, Fong G. 2012. Tobacco taxes as a tobacco control strategy. *Tobacco Control*; 21: 172-80.
- 14 Collis J, Grayson A, Johal S. 2010. *Econometric Analysis of Alcohol Consumption in the UK*, HMRC working paper 10. London: HMRC.
- 15 Lin BH, Smith TA, Lee JY, Hall KD. 2011. Measuring weight outcomes for obesity intervention strategies: the case of a sugar-sweetened beverage tax. *Economics and Human Biology*; 9: 329-41.
- 16 Bahl RW, Bird RM, Walker MB. The uneasy case against discriminatory excise taxation: soft drink taxes in Ireland. 2003. *Public Finance Review*; 5: 510-33.
- 17 Finkelstein EA, Zhen C, Nonnemaker J, Todd JE. 2010. Impact of targeted beverage taxes on higher- and lower-income households. *Archives of Internal Medicine*; 170 (22): 2028-34.
- 18 Dharmasena S, Capps O. 2012. Intended and unintended consequences of a proposed national tax on sugar-sweetened beverages to combat the US obesity problem. *Health Economics*; 21: 669-94.
- 19 Mytton O, Gray A, Rayner M, Rutter H. 2007. Could targeted food taxes improve health? *Journal of Epidemiology and Community Health*; 61: 689-94.
- 20 Nnoaham K, Sacks G, Rayner M, Mytton O, Gray A. 2009. Modelling income group differences in the health and economic impacts of targeted food taxes and subsidies. *International Journal of Epidemiology*; 38: 1324-33.
- 21 Marshall T. 2000. Exploring a fiscal food policy: the case of diet and ischaemic heart disease. *British Medical Journal*; 320: 301-4.
- 22 Tiffin R, Arnoult M. 2010. The public health impacts of a fat tax. *European Journal of Clinical Nutrition*; 65: 427-433.

- 23 It should be noted that there is no reported protein deficiency in the UK population. Mean daily protein intakes were well above the Reference Nutrient Intakes in all age and sex groups in the most recent National Diet and Nutrition Survey. Source: Headline results from Years 1, 2 and 3 (combined) of the Rolling Programme (2008/2009 – 2010/11).
- 24 Around 180,000 deaths in UK in 2009 were from cardiovascular disease.
<http://www.bhf.org.uk/research/heart-statistics/mortality/numbers-dying.aspx>
- 25 PPACTE Consortium. 2012. Policy recommendation for tobacco taxation in the European Union: integrated findings from the PPACTE project (Pricing policies and control of tobacco in Europe). Dublin: PPACTE Consortium.
- 26 Jensen J. 2012. Presentation to the National Heart Forum. 29 June 2012.
- 27 Jensen J. 2012. Presentation to the National Heart Forum. 29 June 2012.
- 28 Act No. 2011-1977 of 28 December 2011 on Finances for 2012 (Official Gazette No. 0301 of 29 December 2011).
- 29 Bonnet C, Réquillart V. 2012. *Sugar Policy Reform, Tax Policy and Price Transmission in the Soft Drink Industry*. Transfop Working Paper No. 4. Exeter: Transparency of Food Pricing (TRASFOP).
- 30 Le marché de soft-drinks a la gueule de bois. (The soft drinks market has a hangover). *Le Figaro*: 26 July 2012.
- 31 Bonnet C, Réquillart V. 2012. *Sugar Policy Reform, Tax Policy and Price Transmission in the Soft Drink Industry*. Transfop Working Paper No. 4. Exeter: Transparency of Food Pricing (TRASFOP).
- 32 French lessons in taking on the fizzy drinks brigade. *Financial Times*: 9 September 2011.
- 33 World Health Organization. 2011. *Global Atlas on Cardiovascular Disease Prevention and Control*. Geneva: WHO.
- 34 For reference, a regular-sized can of soft drink contains 330ml.
- 35 National Dietary and Nutritional Survey (OTÁP, 2009).
- 36 US opinion polls put support for sugared beverage taxes at 37% to 72%, support being greater when the health benefits were emphasised. These polls pre-date the era in which rising food prices and falling real incomes have raised concerns about food poverty. Lock K, Stukler D, Charlesworth K, McKee M. 2009. Potential causes and health effects of rising global food prices. *British Medical Journal*; 339: b2403.
- 37 Calculation based on figure of 5,727 million litres of sugary soft drinks consumed in the UK in 2011, from the British Soft Drinks Association.