

The growing global obesity problem: some policy options to address it

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Abstract:

The last few decades have seen fundamental changes in food consumption patterns and life styles around the world. These changes have brought about a rapid rise in overall calorie intakes, increased consumption of livestock products as well as a shift towards increasing sedentariness. Increased food consumption and lower calorie expenditures have resulted in a rapid increase in the prevalence of overweight, obesity and related non-communicable diseases (NCDs). Initially, these problems were limited to a few developed countries. There is however, growing evidence that more and more developing countries are facing similar problems; and, more importantly, there are growing concerns that developing countries could be more adversely affected by this rapid transition in diets and lifestyles.

The growing health concerns have also given rise to an intense debate about possible remedies to slow-down or reverse the obesity epidemic in developed countries and to prevent similar developments in developing countries. Some of the available policy options are being examined in this paper. The instruments analysed include price interventions, both at the level of primary commodities and final consumer goods, direct incentives to promote a healthy body weight and disincentives to maintaining an excess body weight. Finally the paper also presents some experience gathered from a combination of measures in integrated nutrition programmes.

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INTRODUCTION

The last few decades have seen fundamental changes in food consumption and lifestyles. The changes in food consumption patterns were characterized not only by an increase in overall calorie intakes but also by a shift in the composition of the diet towards more meat, eggs, dairy products as well as more sugar, fats and oils, i.e. a shift towards high calorie density diets that are also much richer in saturated fats and cholesterol. The main drivers of this transition include factors such as: (i) rapidly falling real prices for food; (ii) the emergence of new marketing channels and the spread of supermarkets; (iii) and freer trade and globalization of the food economy with the arrival of large, trans-nationally operating food companies and fast food chains. While food consumption changed and dietary energy intakes increased, calories expenditures declined and excess calorie consumption rose rapidly.

In many developed countries, higher calorie intakes and lower calories expenditures have already resulted in a rapid increase in the prevalence of overweight, obesity and related non-communicable diseases (NCDs). Many developing countries are in the process of undergoing a similar nutrition transition (see WHO, 2003), with probably even more adverse health impacts. In fact, there are a number of reasons to assume that developing countries may either be more severely affected by the rapid nutrition transition or be less able to cope with the adverse impacts it brings about (for details see Schmidhuber and Shetty, 2005). At the heart of these problems is the fact that hunger and overnutrition are intrinsically linked in developing countries, both within a given generation² and across successive generations³. These intra and inter-generational links between hunger and overnutrition and their simultaneous occurrence in different socio-economic strata of a given country will also complicate further the choice of policy measures to address the problems of overnutrition and NCDs in developing countries.

This paper will examine a few policy options that are currently considered in developed countries, discuss their pros and cons and their applicability in the economic environments of both developed *and* developing countries.⁴ The discussion of these policy options includes an examination of their effectiveness and efficiency, and an evaluation of their pros and cons and their compatibility with other policies, such as freer trade in agriculture or the reduction of agricultural subsidies. The presentation and discussion of possible policy measures will be limited to a few instruments; the focus will be placed on policy measures that have received particular prominence in the current public discussion in developed countries and in developing countries in rapid economic and nutrition transition. No claim is being made that the selection of instruments is comprehensive or representative⁵. The remainder of paper is organized as follows: The paper will first look at the effects of price interventions, both at the level of primary commodities and final consumer goods (food taxes), then examine the possibilities of tax on excess body weight (taxes on overweight/obese people), and finally present some experience gathered with a combination of various measures in integrated nutritional programmes.

² See e.g. the discussion on intra-generational effects of stunting on overweight and obesity in later life.

³ See e.g. the discussion on links between pre-natal undernourishment and overweight/obesity in the later life (Barker hypothesis).

⁴ For the United Kingdom, see for instance: <http://news.bbc.co.uk/1/hi/uk/2988314.stm>; for the United States: <http://www.usatoday.com/life/2002/2002-02-19-diet.htm>; for Australia:

http://www.consumerfreedom.com/headline_detail.cfm?HEADLINE_ID=1960

⁵ “Soft measures” such as education and labelling policies are completely excluded from the discussion.

FOOD PRICE INTERVENTIONS

One of the most popular proposals to come to grips with the growing obesity epidemic and associated public health costs has been the proposal of a tax on energy-rich foodstuffs.⁶ These proposals are now being discussed by health officials and public policy-makers with a view to identifying their *effectiveness* in reaching their stated objectives, their *efficiency* relative to other measures, and their shortfalls and side-effects. In principle, interventions could take place at two different levels. The first would be to influence producer prices for food, i.e. interventions at the agricultural producer level. There is a long history of such interventions in Organisation for Economic Co-operation and Development (OECD) countries and an equally long debate about the effects and problems that have emerged with such interventions on agriculture, but relatively little has been said about consumers and food consumption. The second entry-point for price interventions would be at the consumer price level. These interventions are currently largely limited to surcharges in the form of value added tax (VAT) and total or partial exemptions from such VAT surcharges. The following will try to shed some light on possible impacts of the two types of interventions and will try to provide answers that arise in the context of policy interventions.

The case for food price interventions

The basic case for food price interventions rests on the notion that higher prices could provide a means to reduce excess food consumption, which is in turn associated with significant societal externalities. Put differently, the price of food energy set by a free market reflects the cost of producing the food rather than true cost (which is the production cost plus the external costs of treating NCDs such as coronary heart disease (CHD) or non-insulin dependent diabetes mellitus (NIDDM)). If food markets fail to capture the full costs of excess consumption, a tax – set at the level where production cost plus tax will equal the production cost plus external costs – would provide an economically efficient solution.

But there may be important rejoinders to the tax argument. For instance, that a tax on excess food consumption could be a regressive tax as it creates an extra burden on people with higher calorie needs or lower incomes. Moreover, interventions on food prices in a system of increasingly freer trade in food and agriculture are likely to create incompatibilities with commitments taken elsewhere, notably those taken within the World Trade Organization (WTO). Not liberalizing trade means foregoing efficiency gains to be had from a better allocation of production, which would need to be taken into account in the overall cost-benefit analysis of such a tax. How effective and efficient these taxes are in practice, and how compatible they are with other policy reforms will be discussed in the following section.

Price interventions at the producer level: “a tax on primary products”

As already mentioned, producer price interventions for food products are a commonly used tool of agricultural policies in developing and developed countries alike. Numerous studies have analysed their impacts on agriculture, farm households, incomes, the environment or rural development. But relatively little is known about their impacts on consumers and food consumption patterns. In fact, many analyses simply assume that changes in producer prices are fully transmitted to the consumer level or that consumers are implicitly assumed to change their consumption patterns according to a change in producer prices.

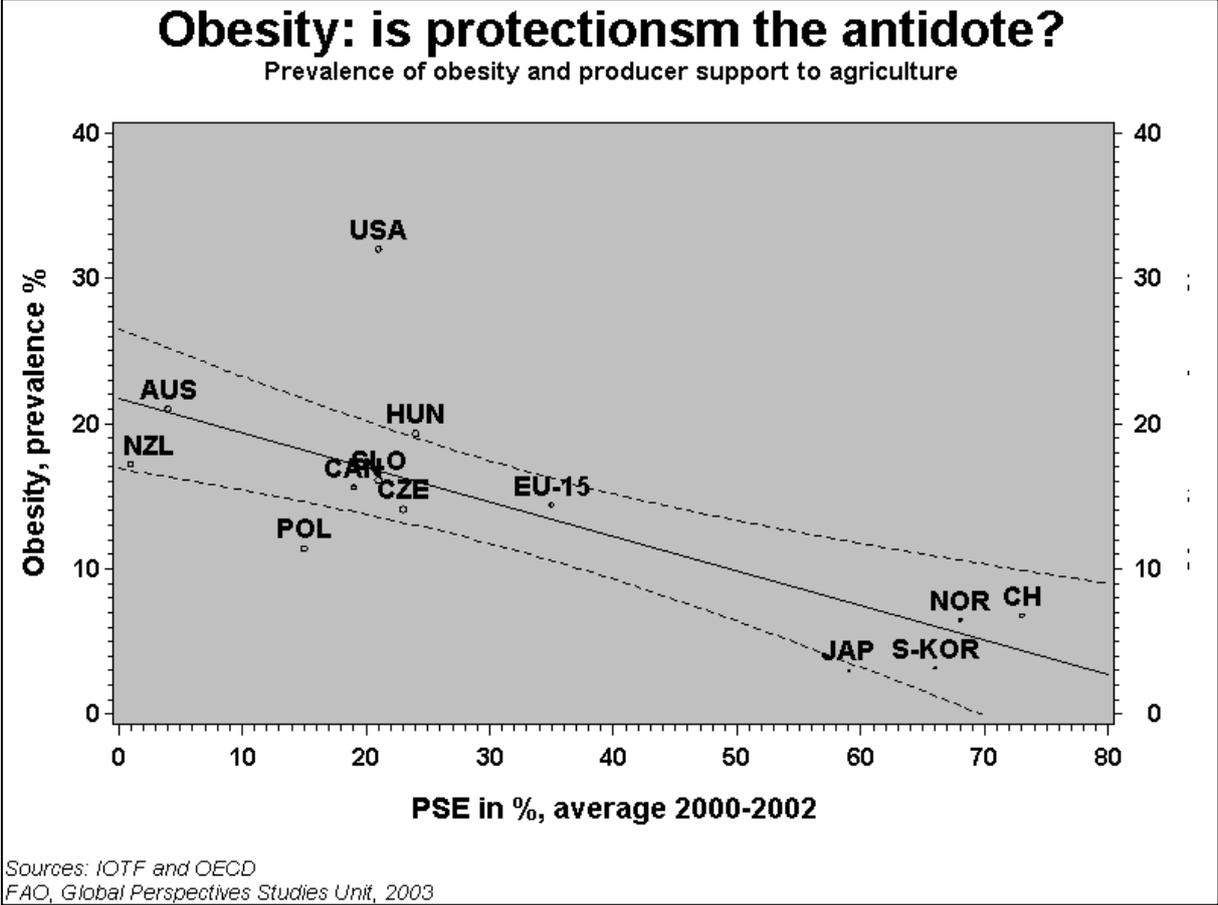
Interventions at the producer level have been subject to controversial policy debates,

⁶ For details of a recent debate at governmental level on a tax on fatty foods in the United Kingdom, see for example: <http://www.theage.com.au/articles/2004/02/19/1077072753005.html?from=storyrhs> or <http://news.bbc.co.uk/1/hi/health/3502053.stm>

particularly those associated with higher border protection, intervention price systems and export subsidies. Any suggestion to increase such measures for the sake of possible health benefits would therefore add to an already contentious debate and should be most carefully vetted before any inference is drawn.

Much of the rationale put forward by the proponents of agricultural price interventions rests on the observations that countries with massive support to agriculture, high producer prices and high border protection are benefiting from relatively moderate prevalence levels for obesity. This relationship is depicted in Figure 1, which in fact suggests that the OECD countries with the highest Producer Support Estimate (PSE) rates (Japan, the Republic of Korea, Norway and Switzerland) have the lowest prevalence rates of obesity, while Australia, New Zealand and the United States, all with low or middling levels of protection, are burdened with relatively high prevalence rates of obesity. The question that arises in this context is whether this relationship is of a causal nature, i.e. whether it is a matter of correlation or causation.

FIGURE 1
Support for agriculture and the prevalence of obesity

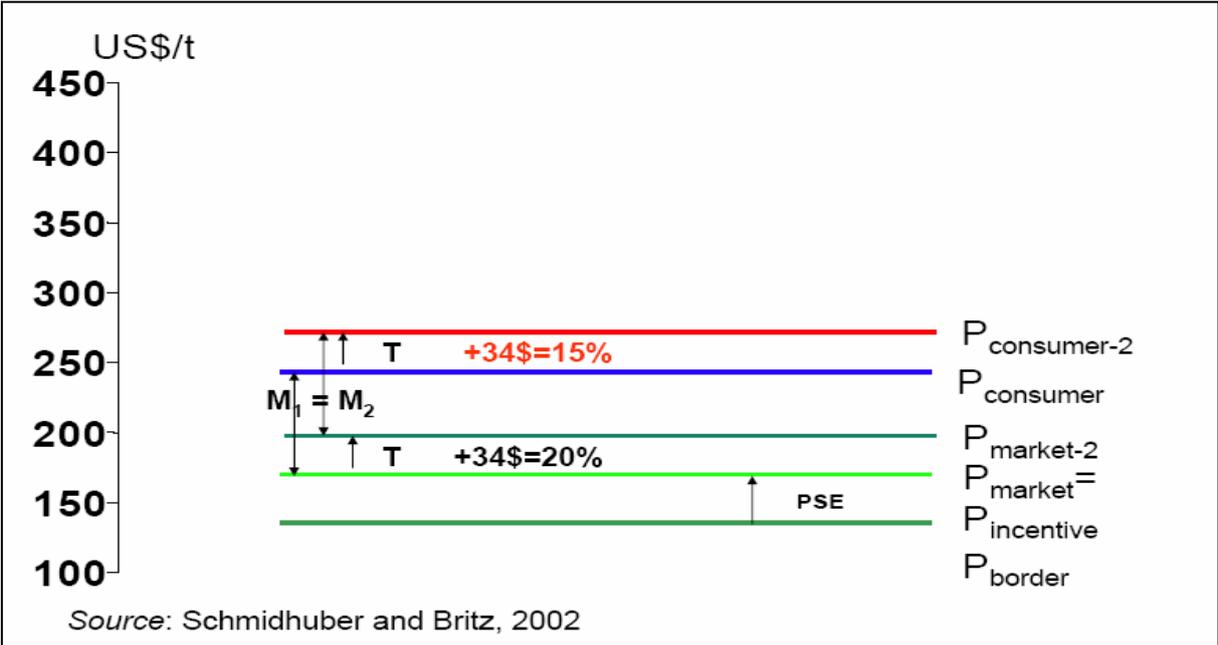
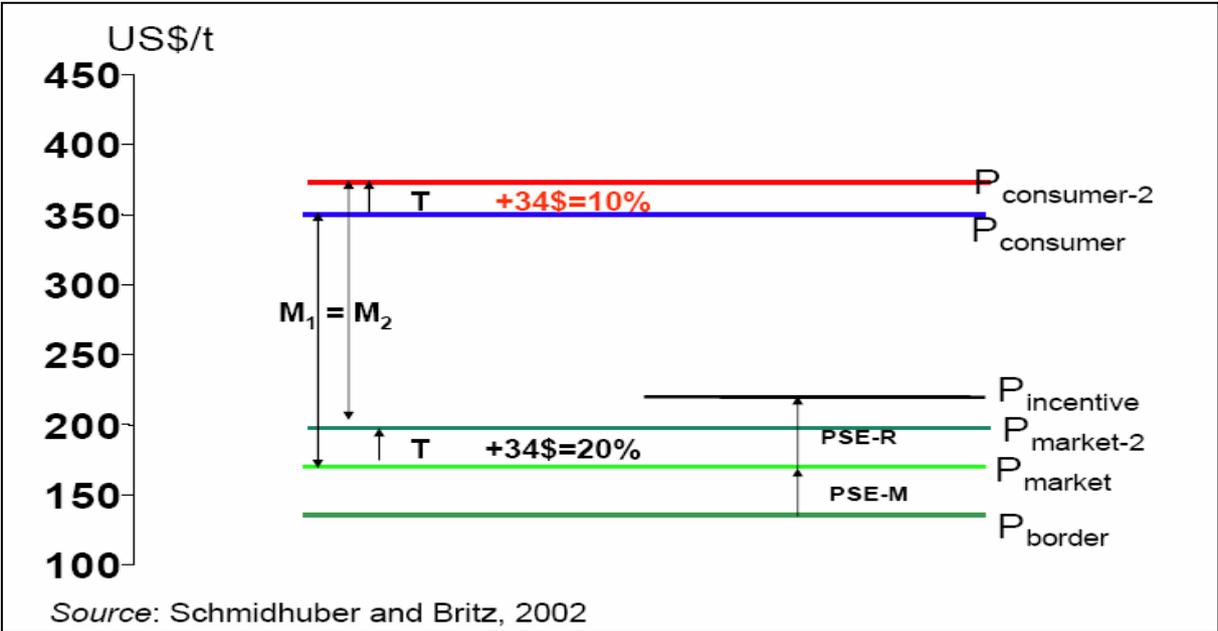


A necessary condition for a causal relationship is that a price increase at the level of the protected agricultural product has a substantial impact on final consumer prices. The question therefore is how and to what extent prices are transmitted along the food chain and to what extent the value share of farm products affects the final consumer price. A number of empirical studies help to find an answer to this question. These studies show that: (i) the value share of primary products in the final consumer good has been declining over time (with rising value share of services included in the product); and (ii) that there are considerable differences across commodities (for example, very low for wheat/bread and high for eggs).

The high service element in the differences also means that the margins between producer and consumer prices are typically much higher in developed than in developing countries. For some products at least, an increase in the producer price in a developed country (regardless of whether through higher border protection, higher support prices or a combination of the two) may therefore not create a sizeable increase in consumer prices. This suggests that a change (increase) in producer prices for food would in general be a rather blunt tool to change food prices at the consumer level and thus have little influence on food demand. Figure 2 should help explain the channels that affect the transmission of prices from producers to consumers.

FIGURE 2
Examples of the agricultural price formation at support levels and processing margins

The impact of a tax/tariff with high margins
(OECD country)



The impact of a tax/tariff with low margins (developing country)

The upper pane of Figure 2 depicts the main factors that affect the *horizontal* and *vertical* price transmission for food products in a *developed* country (Schmidhuber and Britz, 2002). What is referred to as the horizontal transmission is essentially the transmission of primary product prices across the border from international markets to the domestic commodity market. In many OECD countries, this process is often heavily affected by agricultural policy measures. In this process, the internal price formation starts from a (low) border price that is raised, e.g. through a tariff, to the level of the domestic market price. For producers, this market price is further increased (e.g. through a direct transfer) to the level of the farm incentive price, which drives the level of input applications and allocated area. The domestic market price is where the vertical price transmission process starts. It starts with a wholesale operation (cooperative), pooling supplies from farmers; the primary products (cereals) are then further processed at various stages (flour, bran, etc.); intermediate products are further refined (different types of flour), added to other products and eventually sold as the final consumer good (bread, breakfast cereals, etc.) by a retailer (supermarket, bakery). In this multistage process, the various agents often add considerable margins for the processing or marketing services they provide. As a result, the value share of primary good (wheat) eventually accounts for only a small share of the final value of consumer good (bread)^{7,8}.

The situation is quite different where primary products account for a larger value share in the final consumer good (Figure 2, lower pane); not an atypical case for the price formation in many *developing* countries. Any price increase at the producer level would translate into a more substantial increase in consumer prices and, where consumers are price responsive, result in a reduction of consumption. Higher consumer prices for food in developing countries, however, may also mean that – other things being equal – undernourishment may increase. It also explains, although does not justify, why many developing countries have chosen to tax their agriculture to the benefit of (urban) consumers rather than protecting it.

From the consumer point of view, the impacts of low shares on the final product is in effect described by Marshall's theory of derived demand (Marshall, 1920), i.e. that demand is typically fairly inelastic where the primary commodity forms only a small component of the final good. It may therefore be more efficient to levy a tax directly at the consumer level, again distinguishing the impacts of low and high price elasticities of demand.

Price interventions at the consumer level: a tax on “food”

A similar, although in its impacts somewhat different, approach to address the growing obesity problem is the proposal to levy a tax directly on consumer prices of food. Particularly in developed countries, the discussion has recently advanced from the theoretical proposition to examining actual and operational issues. Public health officials⁹ in particular have been proposing concrete measures to increase the costs of energy-dense and “saturated fat rich” foods by adding an extra tax on energy-rich food or reducing the food VAT exemptions that are still in place in many countries.

While enthusiasm among public health advisors for such a tax is understandable, issues pertaining to the economic effectiveness and the operational efficiency of such measures in

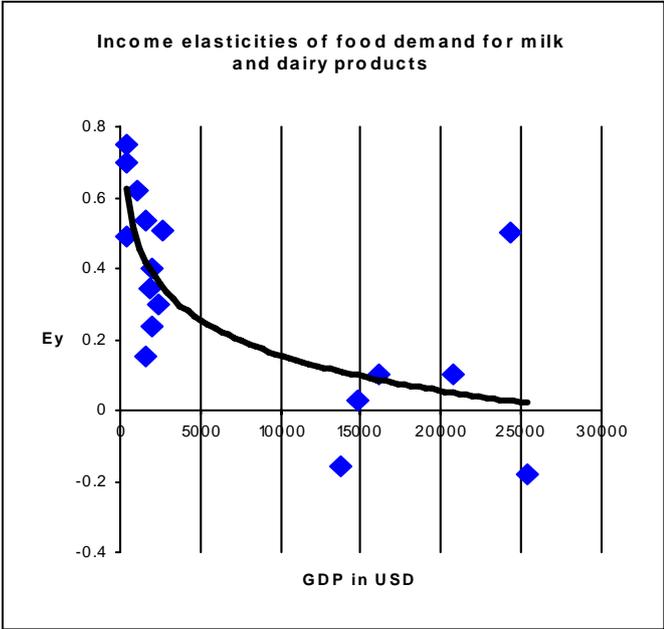
⁷ Notable consumer price impacts are only likely if tariffs are extraordinarily high and/or processing and marketing margins are very small. Rice in Japan could be a case for more significant impacts on consumer prices, except that consumers in Japan have shown little responsiveness in their consumption of rice.

⁸ In Figure 2 (upper pane), the margin between producer and consumer prices is assumed to be 100 percent. For cereals, the margin may exceed 500 percent and more, while it should be less than 100 percent for eggs.

⁹ Dr Martin Breach, spokesperson for the British Medical Association, for instance, proposed a 17.5 percent VAT on high-fat foods. The Australian Medical Association is promoting similar measures.

reducing obesity are less clear. Again, the effectiveness of such a measure depends crucially on how responsive consumers of these foods are to price changes induced by (higher) taxes. The elasticities used in the FAO@2030 model¹⁰ in Figure 3 give an idea of the general link between income levels and the responsiveness of demand with respect to income levels. They show a clear and strong decline of income elasticities with rising incomes and thus suggest that rich consumers are likely to react much less to a tax on certain foods than poor consumers.

FIGURE 3
Income elasticities at different income levels



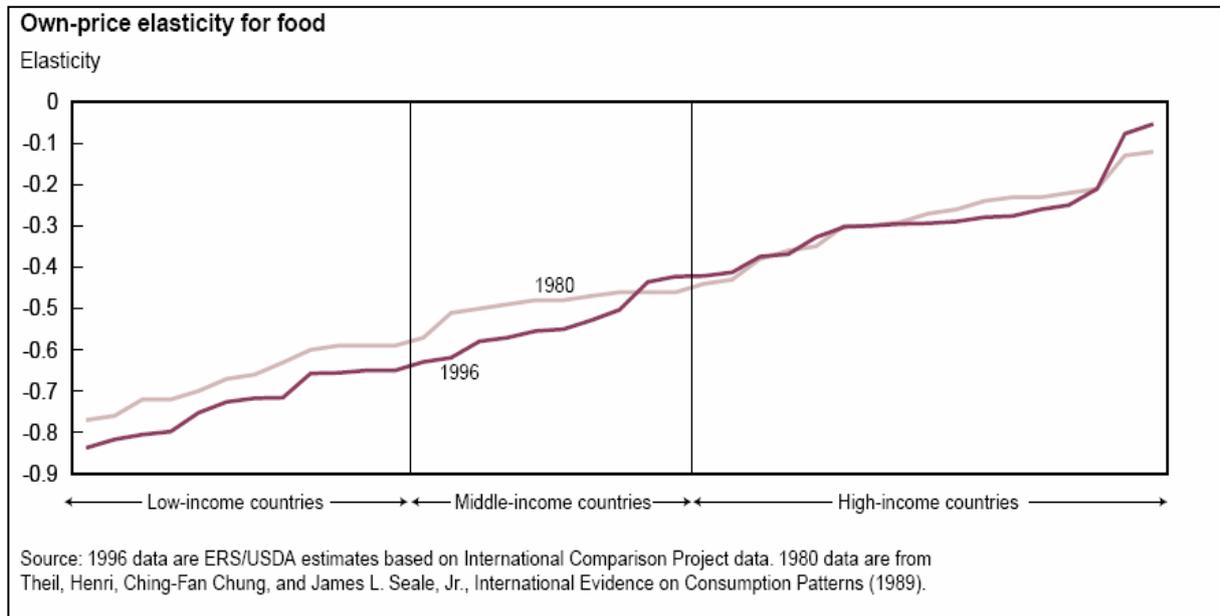
Source: Schmidhuber and Britz, 2002.

In general, income elasticities decline with rising incomes and even become negative (inferior goods) once a certain income level is exceeded. In tandem with lower income elasticities, price elasticities tend to decline (in absolute values) with rising incomes.¹¹ A detailed study by the US Department of Agriculture (USDA) (Regmi *et al.*) fully confirms the theoretical expectation with ample evidence from more than 100 countries. As depicted in Figure 4, rising incomes are associated with a sharp decline in own price elasticities from -0.9 in low-income countries to close to zero in the top range of the high-income countries.

¹⁰ A description of the model is available in Schmidhuber and Britz, 2002.

¹¹ Falling income elasticities do not necessarily mean that price elasticities are also falling with higher incomes. In fact, it is possible to construct a globally well-behaved demand system with low income elasticities as well as high own and cross-price effects. In reality, however, low-income elasticities for food are also associated with low price and cross-price effects.

FIGURE 4
Price elasticities for food across income ranges



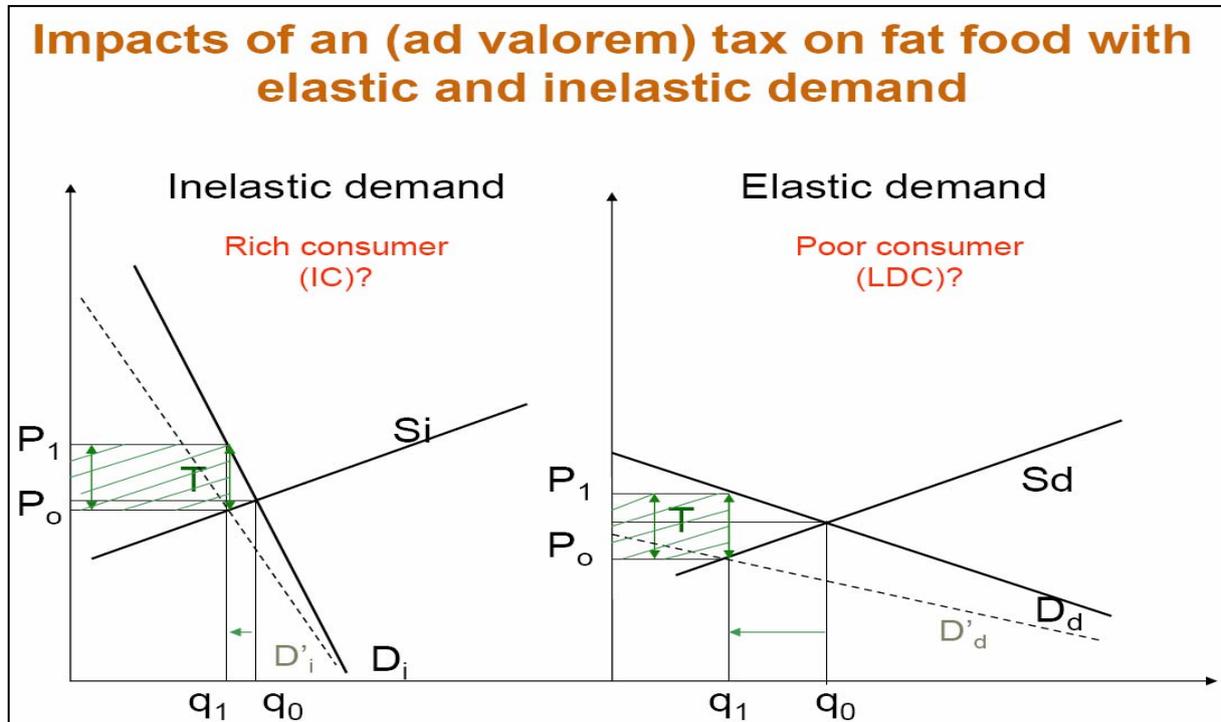
Source: Regmi *et al.*, 2001

The results of this research are summarized in Seale, Regmi and Bernstein (2003). They confirm many of the results obtained and established by earlier studies, notably that: (i) low-income countries spend a greater portion of their budget on necessities, such as food, while richer countries spend a greater proportion of their income on luxuries, such as recreation; (ii) low-value staples, such as cereals, account for a larger share of the food budget in poorer countries, while high-value food items, such as dairy and meat, constitute a larger share of the food budget in richer countries; and (iii) low-income countries are more responsive to changes in income and food prices and, therefore, make larger adjustments to their food consumption pattern when incomes and prices change. However, Seale, Regmi and Bernstein (2003) also found that adjustments to price and income changes are not made uniformly across all food categories. Staple food consumption changes the least, while consumption of higher-value food items such as dairy and meat changes the most. Additionally, the results indicate that when price changes are accompanied by equivalent income changes, wealthier low-income countries and middle-income countries make the most adjustments to their food demand (Seale, Regmi and Bernstein, 2003).

Assuming the basic relationships between food demand, incomes and prices, the principal impacts of a change in food prices, e.g. through a tax, can be examined. Figure 5 depicts the demand response to a tax on excess calories with price elastic (right pane) and price inelastic (left pane) demand. Where demand is inelastic (rich consumers, left pane of Figure 5), a tax on fat food will bring about only a small reduction in demand, thus only providing a small contribution to reducing food intakes and possibly obesity. In fact, the impact of the tax on demand will decline with the elasticity, while the tax revenues will increase. This low-responsiveness situation characterizes many food markets in developed countries, particularly where income differences within an economy are relatively small. The effect could be quite different in middle-income developing countries or in developed countries where incomes are less evenly distributed. Here a tax on excess calorie consumption – applied uniformly across all income strata – would do little to reduce obesity in the high-

income-low elasticity strata but could have a consumption-contracting effect on poor elastically reacting consumers.

FIGURE 5
Impacts of a tax on food with elastic and inelastic demand



There is empirical work that – by and large – confirms these theoretical expectations. In China, for instance, Guo *et al.* (1999) documented the possible reactions of consumers to price changes in various food items across a range of income strata. They found that: (i) consumers in low-income strata are more responsive to price changes for certain food items than rich consumers. For example, pork consumers in the poorest strata are reacting three times as elastically as consumers in the richest strata; and (ii) “an increase in the price of a food tends to drive consumption away towards its substitutes”. They finally conclude that “increases in food prices have much less favourable effects for the poor” (Guo *et al.*, 1999).

Where income and own price elasticities are low but the elasticities of substitution and substitutability between the various foodstuffs are high¹², a price-induced reduction of consumption of a given good would be associated with higher consumption of its substitutes. In such a situation, the effectiveness of a “fat” tax depend on the availability of a low-calorie substitute. Where substitutability is high and substitutes are available, a tax on a high calorie food item may indeed create a reduction in overall calorie intake by making the substitute an attractive consumption alternative at the same or a lower price. A tax on high-caloric soft drinks, for instance, could provide the decisive impetus to make consumers shift to low-caloric light versions; and, where substitutability is high, as in the case of soft drinks, even a small extra tax would suffice to induce such a shift. In the absence of a low calorie substitutes,

¹² Such a food demand system can be perfectly compatible with a well-behaved system of elasticities. Most obviously, homogeneity could be provided by a set of high income and own price on the one hand and high substitution elasticities on the other hand. The same system can be compatible with symmetry and curvature conditions, necessary for a well-behaved food demand system.

however, the impacts of a tax on high-caloric food on overall energy intake are likely to be limited. If, for instance, calories from animal fats are being taxed, consumption of vegetable oils and fats is likely to increase.^{13/14} Regardless of the availability of a substitute, a tax on specific food items could have numerous other side-effects.

As discussed, a tax on animal fats or sugar in industrial countries should promote the consumption of so-called “light” products (light yoghurts, low fat milk, light soft-drinks, etc.), at the expense of consumption of foodstuffs with high calorie contents. But the excess fat and sugar is likely to surface elsewhere in the food chain either domestically or abroad. One vent for surplus in many developed markets is the fast food and snack food industry that adds extra fat and sugar to many of its products, including ice cream, hamburgers and French fries. If these “junk” foods were to be taxed, the fat and sugar added currently to ice creams and hamburgers would occur elsewhere in the food chain. If not domestically, the high calorie parts of a foodstuff could be exported and end up in developing countries. A case in point is poultry meat, where rich economies already consume predominantly the lean parts (breasts), while the fattier parts (leg quarters, wings) are primarily exported, with possible adverse effects on the food consumption patterns and agricultural economies of those countries that import them.

Another problem with a tax on excess calorie consumption is that in practice such a tax would have to be imposed on food items rather than on nutrients (energy) directly. As food items typically contain a group of different nutrients, a tax on a food item rather than on a nutritional component could bring about undesired side-effects. Guo *et al.* (1999), for instance, found that higher pork prices in China may indeed help reduce the intake of energy and saturated fatty acids of rich consumers but may cause an undesired fall in protein consumption by the poor.

A look at excess body weights and dietary energy supply (DES) levels across countries seems to confirm the described impacts of a food tax on overweight and obesity. The left pane of Figure 6 depicts the DES levels and *male overweight*^{15,16} in those countries for which OECD and the International Obesity Task Force (IOTF) provide information. It may help to illustrate a number of different issues that characterize the relationship between dietary energy supplies and excess body weight across different populations. First, it suggests that a considerable overweight/obesity problem can exist even where food supply levels are low on average. Second, the prevalence of excess body weight increases with the average food availability. Third, once the DES exceeds a certain level (about 3 300 kcals/person/day), there is no more increase in the prevalence of overweight. In fact, if obesity estimates were included, the curve would be flatter. The latter reflects the fact that a large share of calories above 3 300 calories is likely to be wasted. All in all, the relationship between food availability and excess body weight resembles a typical input-output function (agricultural production function, diminishing production increments per unit of additional applications of an input, e.g. fertilizer, beyond a certain level).

The tax on fat food (input) – in the context of an input-output function – helps to illustrate the possible impact of a change in input prices (tax on fat food) on the level of output (excess body weight). The right pane of Figure 6 combines the impacts of a tax on excess food energy intake in the input market with the likely effects on the output market

¹³ As King (2002) puts it: “If the government regulates the content of, say, fast food, people will find fat elsewhere”.

¹⁴ A tax on fat could also result in higher consumption of low-caloric fat-substitutes (Olean/Olestra). Despite FDA approval, the health impacts of these substitutes remain however a contentious issue among nutritionists.

¹⁵ Male overweight was chosen because of the larger sample size, which also included low-income countries.

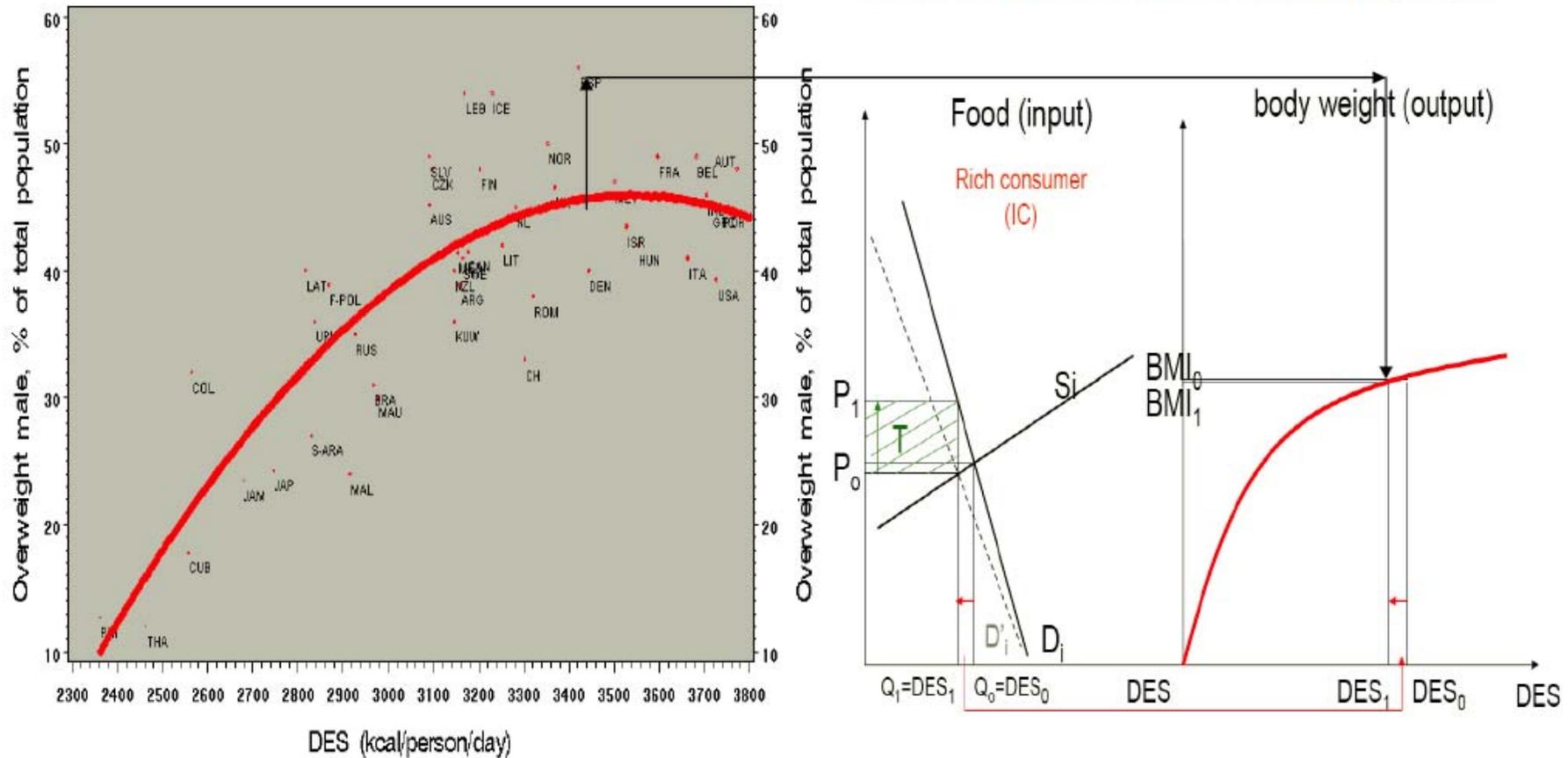
¹⁶ A look at the prevalence of excess body weight across different income strata within a country would have been preferable, but was – in the absence of data - impossible.

(excess body weight). It underlines that the small impacts of the tax on actual food availability are even further reduced as the tax is effective in the flat part of the food energy/body weight curve. The flat part of the curve reflects the fact that a high DES is associated with high levels of waste; societies with DES levels of more than 3 300 kcals also waste a lot more and may thus not experience such a rapid increase in the prevalence of overweight or obesity.

FIGURE 6
Impacts of a food tax on excess body weight

DES and overweight – a classical Input/Output function?

Impacts of a tax on “food” on “excess body weight”



Source: OECD/FAO/TOF, years vary from 1991 to 2001
FAO, Global Perspectives Studies Unit, 2003

Waste is in fact usually the most elastic form of utilization and may therefore be the first to be reduced when prices rise (through tax). Again, this buffer is likely to be more (less) pronounced where incomes and food availability are high (low). As DES levels climb above the 3 300 kcals threshold, the largest part of the incremental food availability is likely to be wasted. This means that a tax on excess calorie consumption (e.g. on calorie-rich foods) may primarily reduce the level of waste in rich countries/for rich consumers while it may affect more directly the poorer consumers with lower waste levels. In the worst case (elastic poor and inelastic rich consumers and large income disparities), a tax on food may do little about obesity and increase undernourishment. In the best case (high level of equality, low food demand responsiveness), it will have a small impact on obesity, reduce waste to a certain extent and be an effective means to collect money that could be used to finance programmes for nutrition education.

As shown above, the link between calorie availability and excess body weight of Figure 6 is based on a cross-country (inter-country) analysis of available data. It was also mentioned that an intra-country analysis of excess body weight would have been preferable but had to be dismissed because of a lack of income-stratified obesity data. The problem with the cross-country data is that it may not be representative of the obesity distribution within a country. In fact, there is growing evidence that – within rich countries – excess body weight is increasingly a problem for poorer consumers, who rely heavily on the cheap but empty calories of the fast food industry. Nestle (2003), for instance, claims that obesity is increasingly becoming a problem of the poor who are disproportionately high consumers of cheap dietary energy. In this case, a tax on certain energy-rich food items (“junk food”) could in fact have a curbing impact on consumption. The problem is of course whether poor consumers in developed countries have alternatives that they could resort to in the case of an extra tax on such food items.

Nevertheless, the disadvantages of food price interventions are likely to outweigh their advantages in reducing or reversing the trend towards a higher prevalence of obesity. For rich consumers, inelastic demand will limit the desired impacts on food demand, while for poor consumers high prices may create an added food insecurity problem. That said, price interventions at the consumer level can have an impact on food consumption patterns if: (i) they are targeted; (ii) demand is reasonably elastic; and (iii) consumers have a choice to shift to healthier foods. Where marketing and processing costs are high and taxes are applied to the final consumer good, the tax revenues could be considerable, the impacts on primary agriculture would be small and thus the trade distortions would be minimal. Where processing margins are small and demand is elastic, tax revenues would be small and the risk of creating adverse impacts on food security could be considerable.

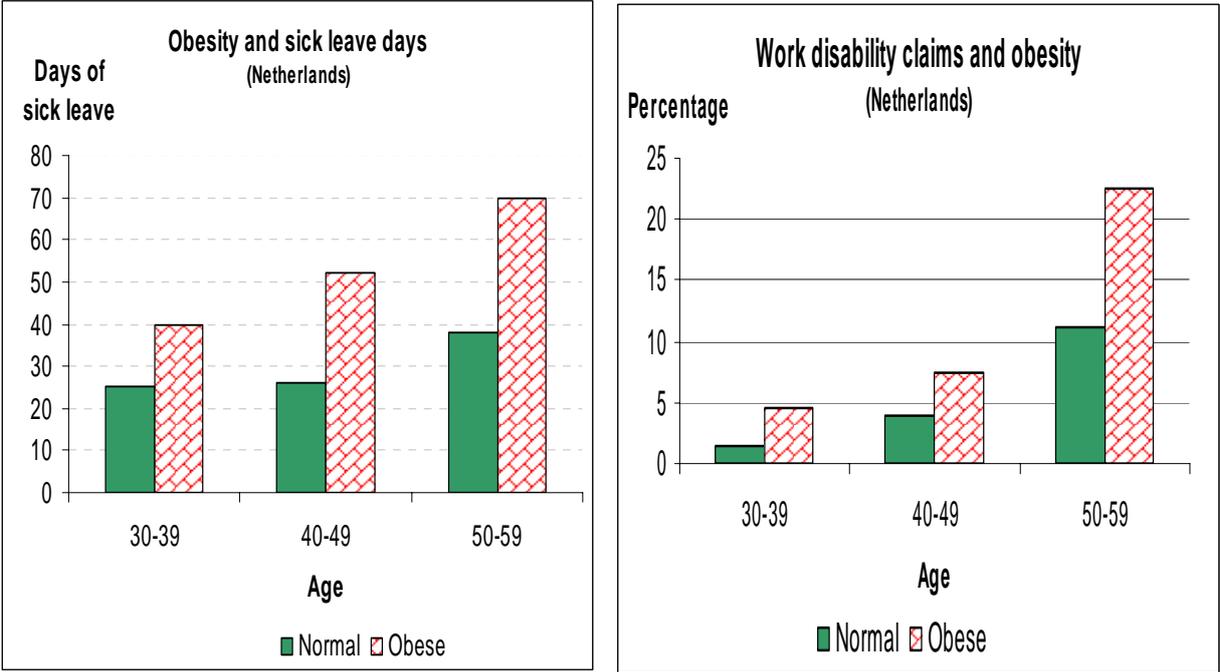
A TAX ON EXCESS BODY WEIGHT

The low effectiveness and efficiency of a tax on energy-dense foods in reducing excess body weight in affluent societies, its potential for creating added trade problems and the risk of increasing food insecurity in poor societies or poor segments of rich societies pose the question of a more effective alternative. One of the most frequently discussed options is a tax on excess body weight rather than on excess calorie consumption. Colloquially, this proposal is being referred to as a tax on “fat people” as opposed to a tax on “fat food”.

While such a proposal may sound exotic at first, in practice it is not. In fact, there are already various forms of incentives or disincentives in place that aim to reduce excess body weight (or prevent increases in excess body weight), even if these measures are not referred to as such. Health insurances, for instance, offer discounts on premiums for clients with normal body weights. Car insurers have started to offer discounts to normal weight customers as there

is growing evidence that obese drivers have a higher risk of causing an accident. Even fast food chains introduce implicit taxes on overweight people by rejecting obese job applicants (Greenhouse, 2003). On the incentive side, employers offer free access to gyms to their employees even during working hours as there is ample evidence that excess body weight reduces the productivity of their staff and increases disability and sick leave claims (Figure 7). In the United States, probably the most important incentive to reduce excess body weight was brought about by a new policy of the Internal Revenue Service (IRS, 2002), stating that "obesity is medically accepted to be a disease in its own right". For taxpayers, this now means that treatment specifically for obesity can be claimed as a medical tax deduction.¹⁷

FIGURE 7
Economic costs of obesity



Source: Narbro, et al. 1996

The basic case for these measures rests on the social costs that overweight people cause for society (Figure 7). In the US alone, obesity related costs have been estimated to have reached a level of nearly US\$ 120 billion (Wolf et al. , 1998), albeit there is growing evidence that this estimate overstates the true costs of overweight and obesity (e.g. The Center for Consumer Freedom, 2004). To the extent that obesity creates external costs for society, a tax on overweight could be perceived as a “Pigouvian” tax that helps bring private costs (low premium and low perception of personal health damage) in line with the social costs for society, i.e. higher health expenditures, lower productivity or more disability claims¹⁸. The implementation of such a tax could either be through a surcharge on overweight people e.g. for health insurance premiums or through discounts for people with normal weights. It could

¹⁷ "Uncompensated amounts paid by individuals for participation in a weight-loss program as treatment for a specific disease or diseases (including obesity) diagnosed by a physician are expenses for medical care that are deductible under §213, subject to the limitations of that section."

¹⁸ To the extent that obesity is a question of nurture rather than nature, such a tax would essentially reflect the application of the “polluter pays principle” for obesity.

also, as in the case of the IRS tax rebates, reward efforts to reduce overweight. The crucial questions for practical policy implementation are: (i) whether such a tax on the “output” (excess body weight) would be more efficient and more effective than a tax on the “input” (excess food consumption); (ii) what differential impacts such measures would have on rich and poor consumers, food availability and food security; and (iii) to what extent obesity is a condition caused primarily by phenotypic and genotypic predisposition or whether it is predominantly the result of a food energy imbalance (calorie intake in excess of calorie expenditure); (iv) whether consumers have enough and enough unbiased information to make informed choices about their food consumption patterns and ultimately their body weights.

There are a number of reasons that suggest that a tax on excess body weight would be both more effective and more efficient than a tax on excess food energy intake. First, a tax on food would address only the calorie intake side of the dietary energy imbalance but leave the calorie expenditure side completely unaddressed. When calorie requirements are high because of physical work, exercise or a less efficient metabolism, a tax on food may create additional private costs without creating a societal benefit. On the contrary, the extra food costs may reduce workers’ productivity, lower their physical activity and thus create an extra cost for society. Poor consumers would be hardest hit. A tax on overweight people would avoid that problem as it directly taxes the result of the dietary energy imbalance rather than only the energy input side. Moreover, a tax on excess body weight should not have any trade distorting impact, as there is simply no need to maintain the food tax distortion through a price wedge for food at the border. Finally, to the extent to which the tax on excess body weight lowers food demand, food prices may actually fall and thus afford an added advantage to poorer consumers.

However, a tax on excess body weight may not be without pitfalls. Most important, lower body weights *per se* are not a guarantor for a healthier diet and lifestyle. In fact, there is no shortage of unhealthy ways to reduce excess body weight. Moreover, relegating the responsibility for excess consumption and thus excess body weights back to the consumers would only make sense, if they are afforded with enough information about the foodstuffs they consume and the health consequences their consumption is likely to bring about. This would require devising companion policies that help reduce the information asymmetry between consumers and the food industry¹⁹, e.g. through appropriate labelling and education programmes. While no attempt is made at this juncture to provide a comprehensive list of possible companion policies or even differentiate measures by effectiveness or efficiency, the measures suggested by Goran (Goran, 2002), could serve as a starting point for further selection and analysis. Among the important measures suggested are: awareness raising for the importance of breastfeeding, promotion of physical activity for children and adolescents (including TV restrictions, see Figure 8), nutrition education in schools, appropriate labelling, etc.

The discussion on the various price and tax intervention mechanisms suggests that there are considerable differences in the efficiency and effectiveness of these measures in helping to reduce the prevalence of obesity. Probably the least efficient and least effective measure would be an intervention at the producer price level. It would also be the measure least compatible with other policy objectives, notably freer trade. While probably more efficient, a tax on consumer prices of food may also cause undesirable side-effects, notably where income inequality is large and where low-income strata react elastically to changes in food prices. A direct tax on excess body weight should be the most efficient and effective measure, but will not be sufficient on its own.

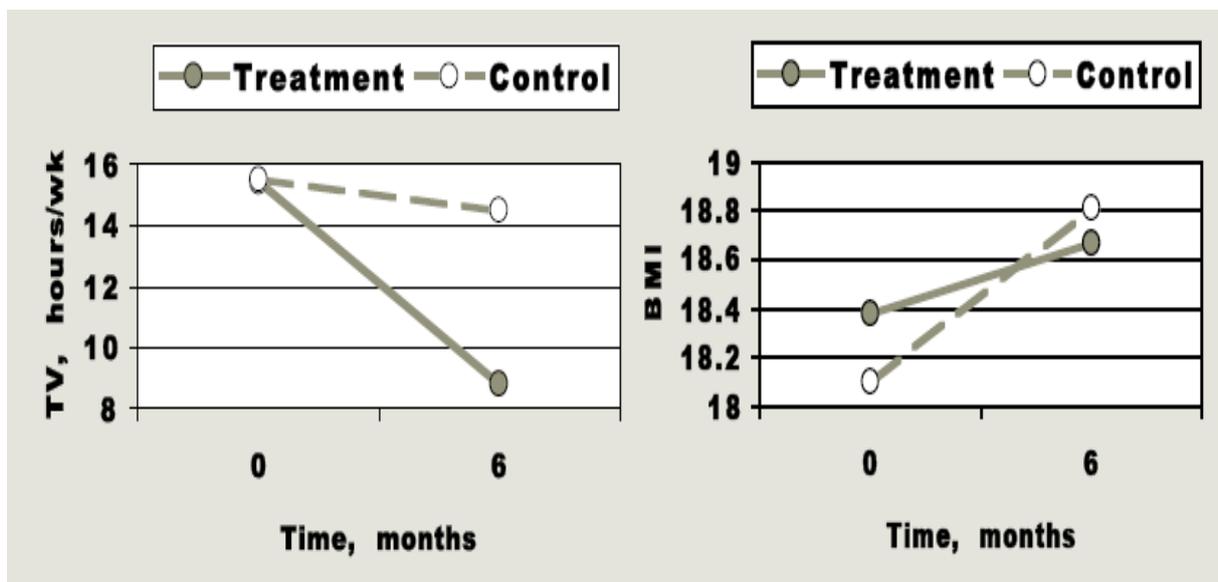
There is also growing evidence (Barker, 1994) that the effect of a phenotypic or

¹⁹ The German food industry for instance spends 38% of its advertisement expenditures on products such as sweets and chocolates, which should account for less than 5% of the recommended calorie intake.

genotypic predisposition can crucially affect the occurrence and degree of obesity. Moreover, a high prevalence of obesity in a given generation can be the result of a higher prevalence of undernourishment in the parent generation, and countries that undergo a rapid nutrition transition may suffer most. In this case, the “polluter pays” principle would certainly not apply and could in fact represent a grossly unfair policy measure.

Figure 8:

Results from a pilot trial to reduce TV/media consumption (Source: Robinson, 1999)



INTEGRATED HEALTH AND NUTRITION PROGRAMMES

The preceding discussion suggested that there is no simple or single solution. Instead, there is growing evidence that it will take a combination of policy instruments to address the problem of obesity and related NCDs successfully. Such an integrated programme has, for instance, been launched in Norway and has – overall – yielded very positive results. The details of the programme are available from Norum (1997). Without repeating the details, the correlates of success were: (i) a strong legal and institutional foundation of a population-wide effort in a national organization, i.e. the National Nutritional Council (NNC); (ii) a robust scientific and empirical backing;²⁰ and (iii) a combination of measures (from food price interventions to nationwide food education programmes) embracing a great number of stakeholders. Practical experience in Norway also suggests that there can be a considerable time-lag between the implementation of various measures and the first measurable success.

The Republic of Korea provides another example of a successful nutrition programme. Details are available from Lee, Popkin and Kim (2002). Kim, Moon and Popkin (2000) find that food energy intake and obesity levels in the Republic of Korea are approximately half of what might be expected in a country at that economic level, while vegetable intake is much higher than might be expected. Lee, Popkin and Kim (2002) suggest that a number of factors have contributed to this outcome. First, there has been a strong movement to retain traditional diets and food preparations. At the heart of this movement is a training programme, which has

²⁰ For example, the “Oslo Study” or the health surveys of the National Health Screening Service.

been offered by the Rural Development Administration since the 1980s. The Home Management Division of the Rural Living Science Institute (Suwon, Republic of Korea) has trained thousands of extension workers to provide monthly training sessions in cooking methods for traditional Korean foods, such as rice, *kimchi* (pickled and fermented cabbage) and fermented soybean products. The programme appears to reach a significant component of the newly married women in the Republic of Korea, but exact statistics are not available. At least to a certain extent, food consumption was also curbed by higher food prices, which were backed by domestic producer price support and border measures. The same combination of food traditions, educational programmes and higher food prices may help to explain the positive nutritional outcome in Japan where, as in Norway and the Republic of Korea, the prevalence of obesity and NCDs remained much lower than in other countries of comparable development and income levels (see Figure 1).

SUMMARY AND CONCLUSIONS

This paper has analysed some of the currently discussed policy options to reduce or avoid food-related causes of excess body weight and NCDs. The analysis included various options, from food price interventions at various levels to integrated nutrition programmes. Interventions at the producer price level have been identified as the least efficient and the least effective in changing nutritional outcomes and reducing excess body weight. They are also unlikely to be compatible with efforts to liberalize agricultural trade. Consumer price interventions are likely to be more efficient – at least in developed countries – particularly as their effects are not diluted by huge processing margins. But what plagues all price interventions is the fact that those consumers who should reduce excess energy intake are likely to be the least responsive to price increases and will thus not alter their consumption patterns only because food is more expensive. Such price interventions could however be effective where they make “healthy” substitutes available at the same or somewhat lower price, for instance a tax on high caloric soft drinks that makes consumers shift to low caloric alternatives.

Probably more effective and efficient than a tax on food would be a direct tax on excess body weight, i.e. a tax on obesity itself. In fact, many developed countries have already instituted such taxes, mostly in the form of penalties for extra body weight or incentives (premiums/tax brakes) to lose excess body weight. The main advantages are: (i) no negative side-effects on food markets; (ii) compatibility with other policy measures; and (iii) no penalty for consumers who need high-energy intake levels because of a higher calorie expenditure. Moreover, the tax would not only have fewer side-effects but be more effective and efficient as it addresses the excess body weight problem from both sides of the energy balance: the calorie intake side and the calorie expenditure side. The main drawbacks are possible difficulties in the actual implementation and the fact that a lower body weight in itself is no guarantor for a healthier diet.

The discussion of the various price intervention mechanisms also underlined that there is no single measure that is sufficient to address the problem. Where progress towards a healthier diet and – in the sequel a healthier population – has become reality, the underlying policy changes included a broad spectrum of measures. These measures encompassed not only price interventions and premiums but also measures to enhance nutrition transparency and education. But even for such integrated programmes, progress is not immediate and even in developed countries decades may pass before tangible impacts are produced. The diversity and complexity of successful approaches, the time-lag between policy measures and their impacts, the accelerating nutrition transition and predisposition to develop obesity and NCDs underline the urgency for action in developing countries.

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