Cutting the Fat:
How a fat tax can help fight obesity

Diabetes New Zealand and
Fight the Obesity Epidemic, Inc.

Foreword

In 1976, a report from the Royal College of Physicians, London, suggested "Obesity is a hazard to health and a detriment to wellbeing. It is common enough to constitute one of the most important medical and public health problems of our time, whether we judge importance by a shorter life expectancy, increased morbidity, or cost to the community in terms of money and anxiety."

This warning was largely unheeded, and the global epidemic of obesity and its consequences has escalated out of control. Inherited attributes may explain a predisposition to the disease but there is no doubt that environmental factors account for its epidemic proportions. Lack of physical activity and increased availability and consumption of energy dense foods appear to be major determinants.

By definition an epidemic should be reversible if the causative factors can be identified and eliminated or reduced. While it is obviously important to encourage individuals to make appropriate lifestyle choices, it is widely recognized that modifying the environment to facilitate such choices is an essential component of the strategy required to halt or, better still, reverse the escalating results.

There is no universal agreement as to how such environmental change might be achieved. However the magnitude of the problem suggests that all possibilities, including legislative measures, must be seriously considered.

This report provides an important contribution to the debate. The fact that the possible introduction of a fat tax is a potentially controversial topic should not inhibit discussion of this or any other measures that may facilitate the lifestyle changes necessary to stem the tide of the obesity epidemic.

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Executive Summary

The obesity epidemic

There is an obesity epidemic afflicting New Zealand, and the obesity epidemic is causing a diabetes epidemic.

Consider the following:

- In the last five years carbonated beverage consumption in New Zealand has increased by about 45 percent; New Zealanders are now the 11th highest consumers per capita worldwide.
- New Zealand children are among the fattest in the world – we have a higher percentage of overweight and obese children than the United States or Australia.
- The rise in type 2 diabetes –the greatest contributor to the diabetes epidemic – is strongly linked to an increasingly overweight and obese population.
- Services to people with diabetes cost New Zealand taxpayers $247 million per year, and this figure is likely to rise to over $1 billion by 2021 with the increasing incidence of diabetes.
- A person with diabetes costs the New Zealand health system 2.5 times as much as a person without diabetes.

Rationale for a fat tax

Health ailments linked to diets rich in fats and calories impose huge costs on New Zealand society, including the costs of treating diabetes, heart disease, and other health conditions. In addition to impairing the lives of those suffering these diseases, debilitating illness and premature death linked to obesity also cause losses to society in the form of lost economic contributions from those who are forced to curtail work or retire early, or die while still in the work force, as well as lost contributions that many retirees make as community leaders and volunteers. Social and cultural contributions are also lost, including to family and wider whanau who could have benefited from assistance with child-rearing, passing of family and cultural history, and simply the enjoyment of having elders present.

There are four main reasons for implementing a fat tax. First, a fat tax would address financial costs to society and act as an insurance premium for the costs of prevention measures and future medical treatment linked to diets rich in fats and calories. This would be similar to the government's current practice of collecting insurance premiums for motor vehicle accidents through petrol tax and a levy on vehicle licenses.

Second, while a fat tax might have little impact on most consumers, a tax could deter children or at least reduce their purchases of unhealthy products. This could change the long-term dietary habits and patterns of some members of the population who might be vulnerable to obesity and related health conditions.

Third, even a tax that imposes only a small burden on consumers could still create strong incentives for food manufacturers to alter product composition to reduce the

energy content and hence the amount of tax paid. This would be especially effective where high-energy items are directly competing with lower-energy alternatives.

And fourth, a tax would generate revenue that could be used to fund complementary measures, e.g. a major advertising campaign, to encourage consumers with excessive energy diets to make the change to a more balanced diet. Earlier studies have found that increased interventions now can reduce the future costs of treating diabetes by about $250 million per year.

Far from denying individual responsibility for lifestyle choices, taxes on alcohol, tobacco and unhealthy foods actually *require* that consumers of these products take more responsibility for the consequences of their actions.

The proposed tax

There are several ways a fat tax could be structured. Options include taxing fat content, following overseas examples of a tax on snack foods and soft drinks, taxing all energy content of food, or taxing only energy-dense (i.e. calorie-rich) foods.

Given the nature of the obesity problem, a tax on foods with high energy density would be the most direct approach. However, this approach would result in a tax on staples such as flour, while exempting energy dense/nutrition poor beverages such as soft drinks. Furthermore, obesity and diabetes are not the only health conditions that would be ameliorated via a well-designed fat tax. In particular, the incidence of coronary heart disease could fall if consumption of saturated fats were reduced. This suggests that multiple criteria would be appropriate.

An approach that is easy to understand, and therefore more viable politically, would be to have one set of criteria for fat content and other criteria for soft drinks, snacks and other foods that are "energy dense and nutrition poor". Apart from beverages, most foods of concern would be identified by the high-fat criteria.

The tax would be calculated and paid by manufacturers, importers and some wholesale food distributors and, in the case of meat products, by retail outlets, except that retail businesses with sales less than $250,000 per year would be exempt.

The rate of the tax would be determined based on a revenue target and the extent of exemptions. Based on predictions of future costs of treating type 2 diabetes, coronary heart disease and other medical conditions linked to diet, a revenue target on the order of $1 billion per year would appear to be justified.

A tax of this magnitude might not be politically feasible, as it amounts to roughly $5 per person per week. This does serve to underline, however, the magnitude of the problem and demonstrates that the upper limit on the tax is likely to be what is politically feasible rather than what can be justified on a rational basis.

Various government jurisdictions in developed countries have implemented taxes on "snack foods" or otherwise imposed differential taxes on food products considered to be less than healthful. From this experience, and from what has been learned from alcohol and tobacco policy in this country, it is clear that taxes can be an effective component of a wider package of measures to reduce the harm to society from these products.

Issues of equity

Low-income people tend to be over-represented in the incidence of obesity and diabetes, as are Maori and Pacific peoples. A fat tax, by helping to fund interventions to reduce the incidence of obesity and diabetes and to improve treatment for diabetics, will have positive distributional impacts for these groups.

Because people on lower incomes spend a higher proportion of their income on food, any tax on food could be seen as "regressive", i.e. having a greater relative effect on the poor. The same could be said of alcohol and tobacco, of course, but that has not been a persuasive argument against taxing those products. If a fat tax leads to substantially better health outcomes for lower income groups, it can hardly be described as unfair.

Financial impacts on disadvantaged groups could be addressed by returning the amount of fat tax paid by a typical low-income household to those families by reductions in income tax rates. For instance, revenue of $1 billion would be sufficient to reduce GST by up to 2%, i.e. to 10.5%, or to fund a 3% cut in the bottom tax rate of 19.5% on income up to $38,000, which would benefit all taxpayers. This would mean that those families that choose to consume more than the average would help to fund diabetes interventions through the health care system to reduce the incidence and improve the treatment of diabetes. Meanwhile, those who eat healthy diets would come out ahead financially, i.e. for them, any increased food costs due to the fat tax would be more than offset by reductions in income tax. Some of the revenue could also be used to fund other health interventions to lower the incidence of diabetes, possibly including eliminating GST on fresh fruit and vegetables.

Finally, equity is not just about helping disadvantaged groups. There is a basic principle of fairness involved in making people take some responsibility for their dietary choices, including paying a share of the consequent medical costs, so that people who adopt more healthy lifestyles do not find that their access to high quality and timely health care is limited because of the costs of treating the epidemic of diabetes in New Zealand. A fat tax can help to slow down, and hopefully reverse, that epidemic, while funding at least a portion of the cost of medical care for the next generation of people with diabetes.

Recommendations

Of the four options presented, this report concludes that the best approach would be to have one set of criteria for fat content and another set of criteria for soft drinks, snacks and other foods that are "energy dense and nutrition poor". More work is required, however, before such a tax could be implemented, including resolution of political as well as technical issues.

We recommend a Select Committee enquiry, with opportunity for extensive public input, to explore and resolve these issues.

Questions that should be addressed by the enquiry include:

- Specific criteria for the tax
- Exemptions
- Revenue target
- Additional health interventions to be funded by the tax

- Reductions in income tax or other taxes to protect low-income households
- How the tax would affect the overall well-being of different groups.

The obesity epidemic is a time-bomb set to impair the lives of hundreds of thousands of New Zealanders and cause spiralling medical costs over the next 10 to 20 years. It is time to seriously consider implementing a fat tax to fight that epidemic.

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1 The Obesity Epidemic

1.1 Introduction

There is an obesity epidemic afflicting New Zealand. The prevalence of overweight and obese children and adults has been dramatically increasing in the past two decades. Simultaneously the incidence of diabetes and other obesity related diseases has been increasing at alarming rates. It has become clear that the obesity epidemic is causing a diabetes epidemic.

Type 2 diabetes is the greatest contributor to the diabetes epidemic and is primarily linked to an overweight and obese population. The increase in type 2 diabetes and obesity is common in all developed countries including New Zealand. Various studies have shown that the dramatic increase in both type 2 diabetes and obesity stems mainly from the prevalence of calorie rich diets and from a sedentary lifestyle, both of which are common in the developed world.

1.2 Type 1 and type 2 diabetes

Diabetes is a long-term condition caused either by a lack of insulin production or ineffective use of insulin by the body. Insulin is a hormone that helps to move glucose from the blood into the fat cells. When there is insufficient insulin or when insulin stops functioning properly, blood sugar levels increase, giving rise to diabetes (PWC Report, 2001, p.1).

Type 1 diabetes appears to be an autoimmune disorder that may be related to genetic abnormalities, but is not related to exercise or peoples' lifestyles (*ibid.*). Type 1 diabetes represents 10 to 20 percent of diabetes cases.

The majority of diabetics, approximately 80 to 90 percent, suffer from type 2 diabetes, which often takes years to develop. It begins when cells in the body stop responding to insulin's "open-up-for-glucose" signal. The body responds by producing more insulin in an attempt to get glucose into the cells. Eventually, the insulin-making cells get exhausted and begin to fail (Harvard Department of Nutrition, 2004). Type 2 diabetes results from both genetic factors and lifestyle factors, but the recent rapid increase of type 2 diabetes in the population indicates that lifestyle plays an especially important role. Causative lifestyle factors include energy dense diets that are high in saturated fat, a decrease in physical activity, and the resulting increase of overweight and obese individuals in the population (WHO/FAO, 2002, p.73).

Diabetes is the primary cause of blindness and kidney failure among adults. It causes mild to severe nerve damage that, coupled with diabetes-related circulation problems, can lead to the loss of lower limbs and also increases the risk of heart disease (Harvard Department of Nutrition, 2004).

1.3 Obesity and health

Epidemiological studies indicate that obese individuals are 50 to 100 percent more at risk of premature death from all causes (POD Report, 2003, p.6). Obesity is significantly associated with an increased risk of type 2 diabetes; coronary heart disease; endometrial, colon, postmenopausal breast and prostate cancers; certain

musculoskeletal disorders; and obstructive sleep apnoea (*ibid*.). It is also a known risk factor for hyperlipidaemia, hepatic steatosis, and gallbladder disease (Turnbull et al. 2004, p.33). A Finnish study found that managing obesity is of utmost importance for the primary prevention of type 2 diabetes. The relative risk of developing diabetes for persons in the highest quintile of body mass index is 6.1 times greater in men and 3.9 times greater in women compared to those in the lowest quintile (Reunanen et al, 2000).

Type 2 diabetes, and being overweight or obese, are generally manageable or preventable conditions through diet and lifestyle interventions. The risk of getting type 2 diabetes can be reduced 50-75 percent by controlling obesity (PWC, 2001). Calorie rich diets are an important risk factor for type 2 diabetes and coronary heart disease (CHD), although there is uncertainty over whether saturated fats or sugars pose greater risk for developing these diseases (Mann, 2002).

Traditionally people with diabetes were instructed to minimise carbohydrate intake with the consequence that diets were often high in saturated fats. Saturated fats are an important risk factor for CHD, and CHD accounts for a large proportion of premature deaths in people with type 2 diabetes. This suggests that it is important to control both sugar and saturated fat intake when considering dietary interventions for diabetes (Mann, 2002, p.784).

1.4 *The obesity epidemic and diabetes*

A recent report indicated that 35 percent of the New Zealand population is overweight and an additional 17 percent are considered obese (Russell, Parnell & Wilson, 1999, pg. 163). The prevalence of obesity in New Zealand has increased 50 percent since 1989 (Russell, Parnell & Wilson, 1999, pg. 163). A recent Hawkes Bay study showed an even more alarming rise in the prevalence of overweight and obese children. Between 1989 and 2000 the percentage of overweight children aged 11 and 12 increased from 11.0 percent to 20.9 percent, while the rates of obese children in the same age group increased from 2.4 percent to 9.1 percent (Turnbull et al. 2004, p.34). These are consistent with a recent national survey that reported 27% of 5-6 year-olds and 33% of 11-14 year-olds as either overweight or obese (Ministry of Health, 2003). New Zealand children are among the fattest in the world; we have a higher percentage of overweight and obese children than the United States or Australia (CDC, 2004; Booth et al., 2001).

The obesity epidemic is driving the mounting epidemic of type 2 diabetes. The Ministry of Health forecasts an increase in the prevalence of type 2 diabetes of 20 percent for Europeans, 34 percent for Pacificpeoples, and 38 percent for Maori during the 15 year period from 1996 to 2011. Diabetes has been included on the Ministry of Health's list of thirteen health priorities (MoH, 2002). Diabetes is the seventh leading cause of death by disease in New Zealanders and accounts for 2 percent of total deaths (Public Health Intelligence, 2004, p.1). Type 2 diabetes is also increasingly common among teenagers and young people whose bodies are put under strain by being obese (FOE n.d).

Approximately 4 percent of the New Zealand population, an estimated 106,000 people, have been diagnosed with type 2 diabetes. Recent reports estimate that for every person that is diagnosed with diabetes there is another that remains

undiagnosed, which means there may be as many as 200,000 people with type 2 diabetes in New Zealand (PWC, 2001, p.14; MoH, 2004a).

According to Ministry of Health projections, by 2021 an extra 60,000 New Zealanders will have type 2 diabetes, resulting in a total of 167,000 diagnosed cases (PWC Report, 2001, p.14). Counting estimated undiagnosed cases, nearly 10 percent of the total New Zealand population, including 25 percent of New Zealand's Maori and Pacific communities, could be afflicted with diabetes by 2021. In Maori and Pacific communities, the disease is about three times more prevalent than in other groups.

An ageing population and more comprehensive diagnoses of type 2 diabetes are probable contributing factors to its rising prevalence. However, unhealthy diet and lack of exercise have been identified as the primary causes of the dramatic increase in type 2 diabetes (MoH, 2002).

This report is limited to a discussion on the role of diet in relation to obesity, type 2 diabetes, and other health issues related to being overweight or obese. This is not intended to downplay the importance of exercise in preventing these diseases.

1.5 The public and private costs of obesity

Obesity and its associated diseases impose significant costs on both individuals and the state. These costs include direct costs of health care intervention, as well as indirect costs such as time off work. Being obese also imposes intangible costs such as restricted physical activity and reduced enjoyment of life.

Diabetes takes an increasing proportion of national health care budgets worldwide. Diabetes is projected to become one of the world's main killers and causes of disability within the next twenty-five years (WHO, 2002). In New Zealand diabetes related costs account for 3 percent of the health budget. However, if the number of people developing diabetes continues to rise, this figure could increase to 10 to12 percent as is the case in the United States (PWC, 2001, p. iii).

Type 2 diabetes is a long term disease that requires long term medical attention once it has set in. A person with diabetes costs the New Zealand health system 2.5 times as much as a person without diabetes (PWC, 2001). Without strategies to minimise type 2 diabetes and other diet and lifestyle related diseases, the burden on the public health system will keep increasing.

In 2001/2002 services to people with diabetes cost New Zealand taxpayers $247 million, and this figure is likely to rise to over $1 billion per year by 2021 if current services are continued, due to the increasing incidence of diabetes (PWC Report, 2001). In comparison, if more optimal services were introduced, including increased education and early intervention, the direct medical cost of type 2 diabetes by 2021 would be $746 million (*ibid.*). This translates into a huge financial savings for the Government, enabling health funding to be spent on other priorities and/or taxes to be lower than they would otherwise have been. If the incidence of obesity were reduced, there would also be significant savings due to reductions in coronary heart disease and other medical conditions.

Feasible interventions to slow the increase in average body mass of New Zealanders, from a projected 1.3 kg/m^2 increase to only 1.0 kg/m^2 between 1997 and 2011, could avoid nearly 400 premature deaths per year (Ministry of Health, 2003). Increasing fruit and vegetable intake by a modest 40 g/day, about 10% more than 1997 levels, would avoid a further 330 deaths per year (*ibid.*).

2 Energy and fat in the New Zealand diet

2.1 Food types and their effect on the body

Diet and nutrition are extremely complex. The impact of certain food types on health varies from person to person, and depends on genetics as well as other lifestyle factors such as physical activity and smoking. However, despite the complexity of nutrition issues, there are some clear trends in New Zealand's health statistics, such as the dramatic rise in obesity and obesity related diseases, which are clearly linked to nutrition and urgently need to be addressed. This section outlines some of the specific issues in relation to food types and nutrition sources that affect health.

Sugar in the diet

In the modern diet excess sugar can contribute to nutritional deficiencies by oversupplying calories without providing nutrients. Sugar *per se* is not "bad", but nutrient rich foods should take priority over foods that are "energy dense/nutrient poor". A joint report from the World Health Organisation (WHO) and UN Food and Agriculture Organisation (FAO) suggested that dietary intake from free sugars should be restricted to less than 10% of energy consumption (WHO/FAO 2002). Mann (2004) suggests that free sugars in the diet contribute significantly to weight gain, and in one study a high sucrose diet resulted in greater weight gain than a high fat diet.

Some research indicates that sugar sweetened drinks high in calories contribute significantly to weight gain, especially among children and young adults (Ludwig et al, 2001). In New Zealand non-alcoholic beverages, including sugar sweetened drinks, contribute 10% of energy intake in the diet of 15 to 24 year olds (Russell et al, 1999), and anecdotal accounts suggest that, for some children, up to 20 percent of energy intake is derived from carbonated-beverages (NZ Herald, 2002).

Soft drinks are therefore a significant contributor to energy-dense diets, especially for teenagers and young adults. In the last five years carbonated beverage consumption in New Zealand has increased by about 45 percent; New Zealanders are now the 11th highest consumers per capita worldwide (Chacko, McDuff & Jackson, 2003). Sugar-sweetened soft drinks are very energy dense, with up to 10 teaspoons of sugar in each 330ml serving. The extra energy consumed in soft drinks is not well compensated for in subsequent food consumption, as the hunger mechanisms in the body do not tend to account for the energy consumed in drinks as well as they do for solid foods (Ludwig et al, 2001). A US study found that the risk of children becoming obese increased 1.6 times for each serving of sugar-sweetened drink consumed every day (*ibid.*). That is, a child who consumes on average 2 soft drinks per day has a 160% greater chance of becoming obese than a child who consumes only one soft drink per day.

2.2 Types of fat

As well as the overall energy density of foods it is important to consider the types of fat being consumed, as some fats are more dangerous for the health than others. Excess fat in the diet is a significant contributor to problems of weight gain, and in some cases heart disease. However, there are different categories of fats, some of which play an important role in the healthy functioning of our bodies. Fats are important for maintaining the health of cell membranes, improving nutrient use, and

establishing and controlling cellular metabolism. Fatty acids also provide the raw materials that help in the control of blood pressure, blood clotting, inflammation, body temperature, and other body functions. Fat helps in the absorption, and transport through the bloodstream, of the fat-soluble vitamins A, D, E, and K (McDade, 2001. British Nutrition Foundation).

There are two main categories of fats: saturated fatty acids (SFA) and unsaturated fatty acids. SFA is found in animal fats (meat, dairy, and lard), and in palm and coconut oils. Some SFA raise cholesterol levels in the blood, promoting the development of atherosclerosis, leading to coronary heart disease. Some SFA are thrombogenic, increasing the clotting properties of the blood, which also promote cardiovascular disease.

The unsaturated fat group is divided into polyunsaturated fatty acids (PUFA) and monounsaturated fatty acids (MUFA). The PUFA group includes omega 3 and omega 6 fatty acids. Omega 3 fatty acids are found in fish, shellfish, and some seeds including linseed, walnut, and soybean, and also in some eggs and some meat. Omega 6 is found in corn, safflower and sunflower oils. Monounsaturated fats are found in olive oil, avocados, peanuts and almonds, among other things.

Omega 3

Omega 3 fatty acids are made up of the essential fatty acid (EFA) alpha-linolenic acid (ALA), which cannot be synthesized by the body and must be obtained from diet. Its most common derivatives are eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). The body is more readily able to use the latter two (EPA and DHA), which are found almost exclusively in marine plants and fish (Omega-3 Information Service). The human body can also synthesize more useful forms of omega 3 from ALA, which is found in flaxseed (linseed) oil, rapeseed (canola) oil, chia seeds, walnuts and walnut oil, the Mediterranean plant, purslane, grass-reared meat, and dark green leafy vegetables (ibid).

Omega 3 fatty acids are associated with reduced levels of cardiovascular disease. This was first discovered after observing the low rates of heart disease among Greenland Inuit despite their high fat diet (Din, Newby & Flapan, 2004). Some studies suggest that omega 3 reduces the risk of heart disease through its antithrombotic (anti-clotting) properties (Wardle, 2002b). Omega 3 fatty acids are also thought to be: anti-arrhythmic, anti-atherosclerotic, and anti-inflammatory. They also lower blood pressure, and lower triglyceride concentrations (Din, Newby & Flapan, 2004).

Analysis of information from the Nurses Health Study in the United States found that higher intake of fish and omega 3 fatty acids were associated with lower rates of coronary heart disease and total mortality among women with diabetes (Hu et al. 2003).

The modern western diet is high in omega 6, but low in omega 3. It is thought that an imbalance of omega 6 to omega 3 ratio, as is the case with the New Zealand diet, is detrimental to the health (Raes et al, 2004; Ulbricht & Southgate, 1991; Knight et al, 2003). Whereas an ideal ratio of omega 6 to omega 3 should be about 1-4:1, in western diets the ratio is anywhere from 8-25:1 (Omega-3 Information Service). Grass-fed beef and lamb have a ratio 1-2:1 (Wardle, 2002a).

Conjugated linoleic acid

Conjugated linoleic acid (CLA) consists of naturally occurring isomers of linoleic acid with conjugated double bonds. CLA is made naturally in the stomach, especially in ruminant animals. It is found primarily in dairy and beef products, as well as other foods derived from ruminant animals (McDade, 2001).

CLA has been found to have anti-cancer properties in some studies (Knight et al, 2003; Wardle 2002a; Eynard and Lopez, 2003). The daily requirement of CLA for the anti-cancer properties to be effective is thought to be 3 grams per day. 100 grams of lean beef or lamb provide about 10 percent of this daily requirement.

Trans fatty acids

Trans fatty acids are a group of unsaturated fatty acids produced during the manufacturing process when vegetable oils are heated in the presence of hydrogen. Hydrogenated vegetable fats are used in the manufacture of margarine and also in many commercially prepared baked goods, snack foods, and processed foods. They are also often used for frying fast foods. Trans fats are thought to raise the incidence of heart disease by raising LDL (bad) cholesterol, and lowering HDL (good) cholesterol (Harvard Department of Nutrition, 2004).

2.3 Sources of energy and fat in New Zealand diets

Based on research reported in 1999, 16-17 percent of energy intake in New Zealand diets comes from protein, and 45 percent comes from carbohydrates. Thirty-five percent of energy in the New Zealand diet comes from fat, with saturated fat being the main type of fat consumed, contributing 15 percent of total energy intake. Monounsaturated fats (MUFA) provide 11-12 percent of energy, and 5 percent of energy comes from polyunsaturated fats (PUFA). The energy intake of PUFA is below the recommended level of 6-10 percent (Russell *et al*, 1999).

Bread provides the largest proportion of energy in the adult New Zealand diet, contributing 11 percent of energy. Beverages (alcoholic and non-alcoholic combined, but excluding milk) are close behind at 10%. In young adults (15-24 years) non-alcoholic beverages contribute about 10 percent of energy intake. About 16 percent of the total fat intake in the adult New Zealand diet comes from butter and margarine (Russell et al, 1999). Patterns for New Zealand children are similar, with the main difference being that potatoes and kumara (including crisps and fried chips) are the main source of fat for children rather than butter and margarine. See Table 1.

Table 1. Leading sources of energy and fat in the New Zealand diet

Main sources of energy	% of energy intake	
	AllNZ[a]	Children[b]
Breads (including rolls etc)	11	13
Potatoes and kumara	7	8
Butter and margarine	6	4
Milk	5	6
Alcoholic beverages	5	
Cakes and muffins	5	4
Non-alcoholic beverages	5	6
Sugar/sweets	5	5
Beef and veal	4	
Fruits	4	5
Bread-based dishes	4	
Biscuits		6
Grains & pasta		5

Main sources of fat	% of fat intake	
	AllNZ[a]	Children[b]
Butter and margarine	16	6
Potatoes and kumara	6	9
Beef and veal	6	5
Milk	6	8
Cakes and muffins	6	5
Pies and pasties	5	6
Bread based dishes	5	
Processed meats	5	5
Fats and oils	4	
Cheese	4	5
Poultry	4	6
Biscuits		7

Sources: [a]Russell et al, 1999, p 70. [b]Ministry of Health, 2003, pp 76, 78.

2.4 Nutrition trends in New Zealand

According to work done a few years ago, New Zealanders have had one of the highest fat intakes in the world, with fat comprising approximately 35 percent of dietary energy, including 15 percent from saturated fats (PWC, 2001). New Zealanders were the highest consumers of butter and meat fats of all OECD countries between 1961 and 1995 (POD Report, 2003, p. 7). However, according to the National Nutrition Survey, the amount of saturated fats consumed in New Zealand has decreased since 1989, and more recent work, yet to be published, indicates this downward trend in consumption of saturated fats has continued (M Laugesen, personal communication). This has coincided with increased consumption of carbohydrates over the past decade, comprising 46 percent of dietary energy intake in 1997.

A comparison between the 1989 Life in New Zealand Survey and the 1997 National Nutrition Survey indicate that total energy consumption increased from an average 11,200 kJ to 12,000 kJ per day for males, and from 7,200 kJ to 8,000 kJ per day for females, although this trend might have been reversed more recently (M Laugesen, personal communication). Differences in survey techniques could account for some of these reported changes in energy consumption, but Russell *et al.* (1999, p 179) concluded that the proportion of high-energy consumers has increased. It is difficult to unravel the role of each dietary component as well as exercise in relation to body weight; however, the net result has been an increased prevalence of overweight and obese individuals in New Zealand (*ibid*, pg. 163).

In spite of increased obesity, the incidence of coronary heart disease is declining in affluent countries while the incidence of type 2 diabetes is increasing world-wide. There are many complex and confounding factors influencing the linkages between health and diet. Simple causal connections are difficult to establish, but there is overwhelming evidence that modern diet contributes significantly to risks for diseases such as type 2 diabetes and heart disease (MoH and University of Auckland, 2003).

2.5 *Energy density*

Assessment of dietary records suggests that obesity is associated with the consumption of energy dense foods (Rolls, 2000). This has been studied in terms of satiety and satiation values of foods. Satiety is the effect that consumption of a given food will have on subsequent energy intake. Satiation refers to the amount of energy intake in a given meal. A better understanding of how the energy density of food affects energy intake and satiety will potentially lead to improved management of conditions related to over- or under-consumption of energy (*ibid.*). Rolls concluded that the weight and volume of food consumed affect both satiety and satiation more than energy density does. This means the same volume of food is required to satisfy one's appetite, no matter what the energy density. People tend to consume a constant weight of food whether it be high or low calorie (Rolls, 2000). Therefore, energy dense foods lead to higher overall energy intake.
However, evidence suggests that consumption of energy dense, nutrition poor beverages (e.g. soft drinks or alcoholic drinks) results in little or no satiety compared to solid foods, and may even be correlated with higher total energy consumption (for a brief review, see McCrory et al., 2002).

The main means for controlling obesity is to manage the calorie imbalance that arises from taking in too much energy and expending too little. One important aspect of this is to look at the total calorie load of the diet. In particular it would be important to target energy dense foods that have low nutritional value. Fats are especially energy dense. They contain 9 calories per gram; alcohol contains 7 calories per gram; and carbohydrates and proteins contain 4 calories per gram. Therefore, a strategy for reducing the number of overweight and obese individuals should seek to reduce the consumption of fats. However, it is also important to consider that low fat but high calorie foods also contribute to weight gain, and the consumption of these would similarly need to be minimised. In particular, this includes foods with high sugar content.

2.6 The Glycæmic Index and Energy Density

The glycæmic index (GI) is a numerical system of measuring how fast a carbohydrate triggers a rise in blood sugar, relative to a benchmark food (usually white bread). The higher the number, the greater the blood sugar response. Highly processed foods, e.g. refined sugar, refined white flour, etc, tend to have a high GI value, whereas whole grains and other unprocessed foods have relatively lower values. Another measure, glycæmic load (GL), reflects the impact of carbohydrate consumption by multiplying the glycæmic index times the amount of carbohydrates in a serving (Brand Miller et al, 2002).

GI and GL values help people who are already diabetic regulate their blood sugar levels, and can also assist those trying to manage body weight. They measure only one attribute, however, and can lead to misunderstanding if used in isolation. For example, fats can slow the rate at which food is digested and therefore lower GI values (Garrett and Phillmore, 2003), but foods that are high in fat still present health risks if consumed in excess. Baked potatoes have a higher GI value than potato chips, but both have a relatively high calorie load and the fat in potato chips can contribute to other health conditions such as heart disease.

2.7 Diet, lifestyle and health

Dietary factors have a huge impact on the physical well being of New Zealanders. The Ministry of Health's report *Looking Upstream* (2004b) estimated that 30% of deaths in New Zealand are attributable to dietary factors, including inadequate fruit and vegetable consumption. Illnesses related to diet include type 2 diabetes, heart disease, stroke and cancer, all of which impose massive social and monetary costs to individuals, communities, and the state. According to a Ministry of Health report, 70% of stroke and heart disease mortality can be attributed to nutrition-related risk factors, and more than 80% of diabetes can be attributed to excess body mass (MoH and University of Auckland, 2003). About one-third of the years of life lost to these causes occurred amongst middle-aged adults, i.e. aged 45-64 years (*ibid.*).

Weight gain is the result of an excess of energy consumed over energy expended through physical activity. Food consumption and physical activity are elements of lifestyle and, as such, are significantly influenced by the social and cultural environment. Assuming that an individual's lifestyle choices are entirely his or her own responsibility would be to ignore the wider environment that encourages such choices.

Recent results from a long-term study conducted by researchers at the University of Otago (Hancox et al, 2004) found that television viewing as a child or adolescent was associated with poor health, a higher likelihood of being overweight, by the time a person was 26 years old. This association held true even after the data were adjusted for factors such as family socio-economic status and familial tendency to being overweight, and even after controlling for television viewing at age 21. The results suggested that the association is likely to be due not only to displacement of physical activity but also the fact that television advertising promotes an unhealthy diet (*ibid.*). Other studies have shown that exposure to food advertisements increases children's energy intake significantly, and that food advertisements are linked to over-consumption of fast food, sugar-sweetened soft drinks, and sweet and salty snacks, as well as to under-consumption of fruit and vegetables (Ludwig and Gortmaker, 2004). Results such as these have led some health experts to call for restrictions on food advertising to children (*ibid.*).

Given the complex and multiple causes of the obesity epidemic, various interventions will be needed. The need for more supportive environments has been acknowledged in the Ministry of Health's implementation plan for "healthy eating – healthy action" (MoH, 2004c), but unfortunately that plan contains mostly "more of the same" kind of measures that have been tried before: health promotions and encouraging the food industry to adopt best practice in food preparation, reduce sugar, fat and salt content in manufactured foods, and replace saturated fats with unsaturated fats. The plan provides no particular incentive for the food industry to adopt these suggestions or, indeed, to restrict their advertising aimed at children.

A fat tax, i.e. a tax on fat and/or energy content of foods, could provide the economic incentive required to drive real change.

3 Rationale for a fat tax

3.1 The externality argument

Much of government intervention in the marketplace, whether through regulations, taxes or public funding for goods and services, is based on the economic concept of "externalities". Externalities are costs that are not borne, or benefits that are not captured, by the person or company engaging in the activity causing those costs or benefits. As a result of externalities, companies do not supply, and individuals do not consume, the amount of goods and services (or the appropriate mix) that would optimise total social welfare. Costs are borne, or benefits are captured, by someone other than those making the supply or consumption decisions.

Externalities in theory and practice

Air pollution from a factory is a typical example of a negative externality. The factory owner seeks to maximise profits by expanding production just to the point where the extra revenue from additional output is equal to the additional costs of production. But the factory owner does not pay the health costs suffered by people exposed to the pollution. This leads to inefficient production levels, because if those costs were included in the factory's profit calculations, the additional costs would exceed the additional revenue for some of the factory's output.

Economists have long recognised that, at least in theory, the problem of externalities can be remedied by taxing the unwanted good, in this case the air pollution from the factory. The tax is set equal to the harm per unit of pollution, and the factory owner then takes this tax into account and seeks to reduce the amount of pollution. The resulting profit maximisation leads to less pollution and more efficient levels of production (from society's viewpoint).

While elegant in theory, externality taxes are difficult to apply in a theoretically precise manner, for two main reasons. First, the costs associated with the externality can be difficult to determine. Economists have developed various methods for estimating these costs, though the estimates often prove controversial when used for regulatory purposes. Second, the relationship between the amount of the externality and the costs imposed on others is often not linear. For example, there may be little harm from a small increase in pollution when exposure is at low levels, but much greater harm and cost from a similar increase when exposure is already moderately high. In such a case, a flat rate externality tax is unlikely to achieve optimal economic efficiency.

Notwithstanding these difficulties, public policy operates in a world of 'the good' rather than 'the perfect'. Where significant negative externalities exist, even if the optimal rate of a tax cannot be determined, establishing a tax at a moderate level, e.g. based on estimated average costs of harm, is likely to improve overall outcomes for society.

Externalities associated with tobacco, alcohol and unhealthy diets

Taxes on tobacco and alcohol can be justified as measures to address the negative externalities associated with excessive consumption of these products. Tobacco has been identified as a major risk factor in lung cancer and emphysema, among other health ailments, imposing significant health care costs on public health systems (WHO, 2004). Smokers themselves suffer from the health ailments but in New Zealand pay only a small share of the costs of treatment, and also inflict harm on those exposed to significant quantities of "second-hand" tobacco smoke.

Externalities associated with alcohol over-use are rather different but still considerable. First, small amounts of alcohol consumption may be beneficial, or at least not harmful (Alcohol Advisory Council, 2001, p 1). Second, alcohol consumption has no direct parallel to "second-hand" tobacco smoke. There is, however, evidence of a clear link between alcohol abuse and domestic violence, fetal abnormalities, physical and mental health problems, drownings, absenteeism and reduced work performance (*ibid.*). Furthermore, excessive alcohol consumption has been identified as a major cause of traffic accidents, with its associated costs in terms of loss of life, permanent disabilities, medical treatment, auto repair, police time and traffic disruption. The social costs of alcohol misuse in New Zealand have been estimated to be between $1.5 billion and $2.4 billion per year (*ibid.*).

Thus, excise taxes on tobacco and alcohol consumption have been justified both as a means of influencing behaviour and for raising revenue to pay some of the associated costs. According to one article (Chaloupka and Warner, 2000), if taxation were the only instrument available to address second-hand tobacco smoke, a corrective tax on the order of several dollars per pack of cigarettes would be justified.

In response to a statement in the New Zealand's Tax Review in 2001 advising "caution in the use of corrective taxes because of the difficulty of measuring or predicting their effects", the Ministry of Health noted in its submission:

> *Excise taxes, while they have historically been justified in terms of revenue raising, are increasingly being recognised internationally as effective tools to facilitate Government public health policy, especially in relation to addressing the harm caused by tobacco and alcohol. Excise taxes are integral to comprehensive public health tobacco control, and alcohol harm minimisation programmes, because they have been shown to modify behaviour and bring about an improvement in individual and community health* (MoH, n.d.).

Unhealthy dietary choices raise some different issues, not least because of the absence of second-party effects akin to second-hand smoke and social problems associated with excessive alcohol use. In addition, although diets high in saturated fats and energy have been linked to a number of health ailments, moderate amounts of both fat and energy are essential for human nutrition. There is, however, no dietary requirement for *saturated* fats, nor for highly refined sugars (Food and Nutrition Board, 2002).

Notwithstanding differences between tobacco and dietary fat and energy, poor dietary choices result in about as much increased morbidity and mortality as cigarette consumption (Rosin, 1998; Ministry of Health and University of Auckland, 2003).

As noted in an earlier chapter of this report, the costs to the New Zealand public health system associated with diabetes alone were estimated at $247 million per year for 2001/02 and are rising at an alarming rate. Even in the absence of second-hand effects, then, a strong case can be made for an excise tax on unhealthy foods to address this externality.

3.2 A fat tax as an insurance premium

A second argument for a fat tax is based on the concept of a tax as an insurance premium to help pay for extra health expenditure engendered by risky behaviour.

As Strnad (2004) explains, healthcare in most OECD countries (including New Zealand) is based on "the treatment principle". This principle requires that all individuals are entitled to at least basic medical services and will not be denied treatment because of lifestyle choices or their inability or failure to purchase private health insurance. Implementation of the treatment principle requires public provision of health services. In New Zealand, the health system is funded through what are effectively compulsory insurance "premiums" paid by the general population via taxes.

In private (i.e. voluntary) insurance schemes, a fundamental tenet is that premiums should as far as possible be adjusted to reflect known risk. Otherwise, people presenting less risk will tend not to take up the insurance, because the cost of premiums exceeds their expected benefits from claims, while people presenting higher risks will be over-represented amongst the insured, because the expected benefits exceed the costs. If serious enough, this "adverse selection" can cause the insolvency of the insurance scheme.

Public health provision, of course, avoids this problem by compulsory funding through the tax system, enabling the treatment principle to be met. This means, however, that people with unhealthy diets are getting their "insurance" subsidized by the rest of the population. Such cross-subsidisation is generally accepted where the medical conditions are effectively random or otherwise outside the control of the individual, for that is the nature of insurance. Cross-subsidisation might also be acceptable where the risky behaviour is deemed to have relatively low risk, or where it is considered to have offsetting socially worthwhile attributes (and therefore should not be discouraged).

But where risk factors are matters within the control of individuals, and should be discouraged, cross-subsidisation is inefficient because it fails to create the appropriate incentives to reduce risk. With the compelling evidence now available that poor dietary choices are directly related to obesity and hence to health ailments such as diabetes and coronary heart disease, cross-subsidisation of these dietary choices is becoming more difficult to defend. There are serious equity implications arising from the fact that, with health services limited by budget constraints, the treatment of people with type II diabetes and other conditions related to their dietary choices is likely to displace the treatment of other members of society.

This is not to say that the treatment principle should be abandoned, for its maintenance is a fundamental component of New Zealand's social welfare state. Rather, it suggests that people making poor dietary choices should pay a fat tax as an

insurance premium against the possible need for medical care to treat conditions related to obesity. Tobacco and alcohol are taxed in New Zealand because they are widely recognised to cause harm to both the individual consumer and to wider society. The same logic applies to foods high in fats and sugars. A fat tax would be much more equitable than cross-subsidisation of poor dietary choices and a shortage of medical treatment for people who are choosing balanced diets. Indeed, a recent report suggests that increased funding for diabetes interventions could actually lower the future costs of services to people with diabetes (PWC Report, 2001, p 84).

Implementing a fat tax as a form of insurance premium would be consistent with the government's current policy regarding funding of the Accident Compensation Corporation (ACC). The ACC collects revenue, i.e. insurance premiums, to cover the costs of motor vehicle accidents through a share of the petrol tax and a levy on vehicle licenses (ACC, 2004). Although far from perfectly targeted, these premiums make more equitable the distribution of ACC's costs that arise from behaviour that creates risk, just as a fat tax would do.

3.3 Information failure and addiction

Another argument for government intervention in the marketplace is "information failure", i.e. the argument that consumers are not fully informed of the costs and benefits of different choices and therefore make decisions that do not maximise their own satisfaction. A variation of this argument is that, even when fully informed, consumers are myopic and underestimate their own vulnerability to adverse outcomes, including the risk of addiction. According to this argument, a tax is justified to correct for this information failure, in order to shift consumers back to behaviour that is more likely to maximise their long-term well-being.

These theories and arguments have been tested with respect to tobacco, with some research demonstrating that consumers understand the risk of addiction to tobacco at least (see Strnad, 2004, for a summary of this literature). Even if consumers are aware of the risk of addiction, however, they might still be myopic about their personal vulnerability to adverse health effects. The generally accepted response to information failure is to provide more information to consumers, rather than to impose a tax. Hence the government requirements for large and stark warning labels on cigarette packaging.

Gruber and Koszegi (2001) present an argument for why a "rational addict" might accept a tax or other penalty on the addictive behaviour. A rational addict understands that his or her self-control might be reduced in the future, and that future plans to quit the behaviour might be frustrated when the future arrives. As Strnad (2004) puts it, "this phenomenon means that it makes sense for the 'present' self to impose costs on the 'future' self," e.g. in the form of a tax.

Whether diets high in saturated fats or other calories are addictive, of course, is debatable, although habituation to dietary patterns can be a similar obstacle to change. According to a model of dietary choice, groups of consumers and food suppliers form persistent "clusters" based on dietary patterns, and consumers become habituated to their current situation (Phillips, 1999, described in Strnad, 2004). Promoting incremental changes to improve health is unlikely to be effective because each cluster is already at a point where utility (i.e. satisfaction) is maximised for members of the

cluster. An incremental move away from this "local" maximum will be resisted. A substantially different dietary pattern (i.e. another cluster) might well offer greater overall satisfaction, but this fact is obscured by habituation to the present position, which reinforces the perceived difficulty of moving to a different position.

This model explains the "paradox of dietary change", i.e. why many individuals who make major, permanent changes in diet, including where these are imposed (e.g. to address a chronic health condition), express no desire to change back, while at the same time most individuals believe that changing their diet "would be a painful and permanent burden" (Phillips, 1999).

By itself, resistance to dietary change is probably not sufficient to justify a fat tax. Information failure and addiction and habituation theories, however, do support a multi-faceted approach to addressing the obesity epidemic in New Zealand society, including advertising campaigns and labelling requirements to address information failure as well as a tax to address externalities.

3.4 Opposition to "sin" taxes

Premature death saves money

Taxes to correct externalities, sometimes called "sin taxes" when applied to alcohol, tobacco and the like, are not without their opponents. The tobacco lobby, in particular, has argued that *if* tobacco consumption leads to premature death (the industry does not usually admit that it *will* cause premature death), the costs of treating tobacco-related illnesses are offset by the savings in superannuation and other retirement pensions and the savings in not having to treat a range of other health ailments associated with old age (Chaloupka and Warner, 2000; Shoven et al, 1989). A similar argument can be made with respect to health costs associated with unhealthy dietary choices, i.e. that costs of treating the resulting illnesses are offset by savings elsewhere. According to this argument, there are no externalities to be corrected or offset.

However, this argument neglects other losses to society associated with premature death. It seems to suggest that those who die prematurely are doing everyone else a favour by dying. But debilitating illness and premature death cause losses to society in the form of lost economic contributions from those who are forced to curtail work or retire early, or die while still in the work force, as well as lost contributions many retirees make as community leaders and volunteers. Social and cultural contributions are also lost, including to family and wider whanau who could have benefited from assistance with child-rearing, passing of family and cultural history, and simply the enjoyment of having elders present. To ignore these contributions of the elderly to society, and focus only on the costs of treating their illnesses and paying their superannuation, is a cynical and narrow view of human well-being.

Consumer sovereignty vs. the nanny state

Another argument against food taxes is that "consumer sovereignty" should be respected. In other words, consumers are said to be the best judge of what will give them the most satisfaction and government should not interfere with consumer choice (Byers, 2002; Parseghian, 2001; both cited in Strnad, 2004).

While various writers have emphasised the importance of freedom as a fundamental element of human well-being, most acknowledge that rights also entail responsibilities

(e.g. see Sen, 1999). One of the attractions of economic incentives such as corrective taxes, as an alternative to coercive regulation, is that taxes respect the basic principle of freedom to choose. Taxes on alcohol, tobacco and unhealthy foods are not examples of a "nanny state" that seeks to dictate what people can and cannot consume. They simply alter the balance of perceived costs and benefits to adjust for costs imposed on others and require those engaged in risky behaviour to pay a larger share of the cost of treating the medical conditions that result.

Far from denying individual responsibility for lifestyle choices, taxes on alcohol, tobacco and unhealthy foods actually *require* that consumers of these products take more responsibility for the consequences of their actions.

Not all "unhealthy food" causes illness

A third argument against corrective taxes is that the amount of harm per unit consumed is not constant and therefore it is impossible to calculate the correct tax. For example, not all consumption of saturated fats leads to diabetes or coronary heart disease. Indeed, fats and energy are essential macronutrients. It is argued that a tax on all saturated fats and other "unhealthy foods" would therefore be unfair as well as inefficient. Why should those who consume these products in moderation pay tax?

A similar argument can be made against taxes on alcohol, of course. Most people who consume alcohol do so responsibly and without imposing costs on others. Yet the simple fact is that excess alcohol consumption is associated with a number of serious health and social problems. Raising the price of alcohol has been a key element in the package of public interventions to minimise the harm from alcohol misuse and abuse. The same is true for saturated fats and other energy-dense foods. The difference is that the insidious effects of excessive consumption of fats and sugars have become known more recently, and hence public awareness of the problem is lower than for alcohol and tobacco.

A related argument is that heterogeneous health responses to diet may make the use of general taxes ineffective or counterproductive (Strnad, 2004). Marshall received several responses to his article promoting a tax on saturated fats (Marshall, 2000). Respondents were mostly concerned that focusing on one nutrient might not have an overall positive effect on in health because the relationship between diet and health is very complex and multifactorial (O'Rourke, 2000; Stanley, 2000; Ravnskov, 2000).

The design of a fat tax can recognise the fact that fats and energy are essential macronutrients, e.g. by exempting all but the most energy-dense foods from the tax. This is discussed further in chapter 6.

High-energy foods are only one factor in obesity

Industries that sell high fat and high calorie foods commonly point out that it is energy imbalance rather than the amount of energy consumed that causes people to become overweight and obese. The obesity epidemic is due as much to the increasingly sedentary lifestyle of New Zealanders and their lack of exercise as it is due to the food that they eat. If people did more exercise and burned the same number of calories as they consumed, they would not gain weight. It has also been argued that genetics is a significant determinant of the body's response to excess fat and energy, and it is inappropriate to single out fat for a tax (Kennedy and Offut, 2000).

While this is undoubtedly true, the relationship between increasingly energy and fat-rich diets and the alarming rise in obesity cannot be denied (see section 1.3 above). Furthermore, public health officials are *not* focusing on high fat and high calorie foods in isolation. Advertising campaigns encourage people to eat a balanced diet, including adequate portions of fruits and vegetables, and to exercise regularly. Just as in the case of alcohol and tobacco, a successful campaign against obesity will require a range of measures, of which interventions to reduce the fat and energy content of foods will be a necessary component.

"Taxes would have to be very high to change consumer behaviour"
Critics of a fat tax might also argue that a tax at a level likely to be politically acceptable will not alter behaviour.

If we accept Phillips' model of dietary change (see 3.3 above), it would seem unlikely that relatively small taxes would, by themselves, lead to significant changes in dietary patterns. But this does not negate the value of a fat tax. A tax that imposes only a small burden on consumers can still create strong incentives for food manufacturers to alter product composition to reduce the energy content and hence the amount of tax paid. This can be especially effective where high-energy items are directly competing with lower-energy alternatives. For example, a seven-week campaign in Clarksburg, West Virginia that encouraged consumers to switch from higher to lower fat milk saw a marked change in milk consumption patterns. The market share for lowfat milk (1% fat content) increased from 18 percent to 40 percent of milk sold. The change was sustained for at least a year (Reger et al, 1998). Similar results were obtained in another community (Reger et al, 1999). While these campaigns did not include taxes or other price changes, they show that people can and will make at least modest changes in their diets in response to interventions.

The experience from taxes on alcohol and tobacco demonstrates that a tax can alter consumption, even with addictive products such as tobacco. And higher prices can deter children or at least reduce their purchases of unhealthy products, and could thereby change the long-term dietary habits and patterns of some members of the population who might be vulnerable to obesity and related health conditions.

A fat tax would also generate revenue that could be used to fund complementary measures, e.g. a major advertising campaign, to encourage consumers with excessive energy diets to make the change to a more balanced diet, i.e. to make the leap to another cluster. While a tax by itself might not result in significant lifestyle changes for most people, it will provide an incentive to change, and complementary measures can build on this. By 2021, this could reduce the projected medical costs of type 2 diabetes by $250 million per year (PWC Report, 2001, p 84).

Finally, quite apart from how much a tax changes behaviour or saves the state, it is reasonable to ask those who indulge in food consumption patterns known to be risky to help fund the treatment of medical ailments that will arise as a result of that behaviour. In effect, as explained above, society would be asking these people to pay an insurance premium to help pay future medical costs. The riskier the behaviour, i.e. the more energy-dense food in a person's diet, the higher the premium to be paid.

"A fat tax would be complicated and costly to administer"

Opponents of a fat tax argue that a tax that differentiates between categories of food would be complicated and costly to administer, both for government tax officials and for businesses. They can point to the fact that some foods vary considerably in their composition at point of sale, for example food sold in restaurants and takeaway outlets. It would be costly and impractical to require these businesses to calculate the fat content of every menu item, which could vary depending on the chef on duty (Strnad, 2004). Similar issues arise with respect to meat – much of the fat is trimmed off and discarded at supermarket distribution centres or the local butcher shop.

These points highlight the fact that any fat tax must be carefully designed so that administration and compliance costs are kept to a reasonable level. But any proposal must be assessed on its own merits. The tax proposal presented in Chapter 6 has been developed with simplicity and low administration and compliance costs firmly in mind. In particular, most food products would be exempt from the tax. It is worth noting that New Zealand's tax on alcohol is administered effectively and efficiently despite applying to a large number of products.

"A fat tax would be unfair on low-income households"

Because people on lower incomes spend a higher proportion of their income on food, any tax on food could be seen as "regressive", i.e. having a greater relative effect on the poor (Marshall, 2000; Jacobson & Brownell, 2000; Strnad, 2004; MoH, n.d.).

The same could be said of alcohol and tobacco, of course, but that has not been a persuasive argument against taxing those products. Wilson et al (2004) compared the reduction in life expectancy due to the financial hardship imposed by tobacco tax with the loss of life expectancy from smoking. Not surprisingly, the estimated harm from smoking is orders of magnitude greater than that from tobacco taxation.

It is difficult to conclude that the poor are worse off from tobacco taxes. Indeed, there is some evidence from the United States and Canada that tax on tobacco is positively associated with higher "happiness" among those with a propensity to smoke (Gruber and Mullainathan, 2002), indicating that at least some smokers find a tobacco tax helpful as a "self-control" device (Gruber and Koszegi, 2002). This helps to explain why some smokers actually favour tobacco taxes (King et al, 2003; Tsai et al, 2003).

A tax on food would of course raise some different issues than taxes on alcohol and tobacco, although the general principles still hold true. Low-income households would be better off, not worse off, as a result of a fat tax, especially if the revenue were used to fund interventions to reduce obesity as well as improve treatment for those with obesity-related illnesses. These issues are discussed further in section 6.5 of this report.

"The public isn't ready for a fat tax"

It could be argued that a fat tax should not be proposed because "the public isn't ready" for such a tax. If public policy debate followed this premise, policy innovation would never happen. Proposals must be developed and debated for the public to understand and get behind new policy measures. Elected representatives have a responsibility to lead this debate.

It is also worth noting that support for a fat tax is already higher that one might think, despite the limited public discussion of the idea. A recent survey found that 40% of New Zealanders support the idea of taxing high fat foods, and another 6% were unsure. In Auckland, 47% thought a fat tax was a good idea (Hill Cone, 2003).

This compared with 59% support for alcohol taxes, with 4% unsure (*ibid*.). Clearly, a major segment of the New Zealand population is in fact ready for a fat tax. It is time for political leaders, the health sector and the food industry to start discussing how it might work.

4 Overseas experience with food taxes

4.1 "Junk food" taxes and other interventions in overseas jurisdictions

Unhealthy diets impose direct costs to the health service, as well as productivity losses and indirect costs to the community. These costs are externalities not reflected in the price of the product or covered by the consumer. Furthermore, Strnad (2004) argues that when the health costs associated with a bad diet are covered by public health care, there is less incentive for individuals to avoid the risk associated with an unhealthy diet.

Taxes on unhealthy foods have been used overseas to either discourage the consumption of those foods or to raise revenue that can be used to fund special programmes, or both. This section introduces some of the ways in which the "fat tax" idea has been put into practice in other countries. These approaches range from special sales taxes on specific snack foods, to the levying of goods and services tax (GST) on snack and convenience foods, while exempting staple foods from this tax.

Taxes on unhealthy foods are just one type of legislative intervention that has been used overseas (Diabetes NZ, 2004). Another common intervention is to specify minimum nutrition standards for foods offered in schools, or even to prohibit the sales of certain items, such as soft drinks. Many governments have also imposed restrictions on advertising targeted at children (*ibid.*).

4.2 Taxes on soft drinks and snack foods

In the United States there are 18 states and one city that levy taxes targeted at soft drinks, candy, chewing gum, or snack foods. These taxes are generally small but generate significant revenue, approximately US$1 billion annually (Jacobson & Brownell, 2000). States differ in how these taxes are levied. It may be at wholesale or retail level, and in some cases is levied in terms of a fixed tax per volume of product or in other cases as a percentage of the sales price. See Table 2.

The majority of these jurisdictions channel the revenue raised into general funds, however, some states allocate the income from these taxes into special areas. In Arkansas revenue raised from soft drink taxes funds Medicaid (a publicly funded medical insurance scheme for the elderly). This tax was approved on a ballot initiative in November 1993. In Missouri funds are used for health department inspections of bottling plants. Tennessee and Virginia use funds for litter control and recycling. In Washington, revenue goes towards violence prevention and drug enforcement. And in West Virginia, the revenue from taxes on soft drinks helps to fund the West Virginia University medical, dental, and nursing schools (Jacobson & Brownell, 2000, Table 1). In no states are taxes used to fund programmes for subsidising healthy foods, improving nutrition, or to pay the health costs incurred from consuming soft drinks or snack foods. Arkansas comes closest to this approach with taxes contributing to funding for Medicaid.

Table 2. State and local taxes on soft drinks and snack foods in the United States.

State or locality	Year enacted or effective	Sales or other tax specifically applied; foods taxed	Annual revenue ($US million)
Arkansas	1992	$0.21/gal of soft drink $2.00/gal of soft drink syrup.	40
California	1933	7.25% sales tax on soft drinks.	218
Chicago	1993	Distributors pay 3% on sales of containers, and 9% on syrups.	8
District of Columbia	1993	5.75% sales tax on soft drinks and snack foods.	4
Illinois	Mid-1980s	6.25% sales tax on soft drinks (other foods 1%-2% tax).	69
Indiana	1963	5% sales tax on candy, gum, soft drinks, bottled water, and dietary supplements.	43
Kentucky	1972	6% sales tax on candy, gum, and soft drinks.	34
Maine	1991	5.5% sales tax on snack foods, soft drinks, carbonated water, ice cream, and toaster pastries.	15
Minnesota	1982	6.5% sales tax on candy, carbonated drinks, flavoured drinks not containing fruit juice, chewing gum, and single serve ice cream.	45
Missouri	1962	$0.003 per gal. of soft drinks produced.	0.4 – 0.5
New Jersey	1966	6% sales tax on candy, and carbonated soft drinks.	67
New York	1965	7.5% sales tax (including average of 3.5% for local jurisdictions) on soft drinks, candy, confectionary, and fruit drinks with less than 70% fruit juice.	203
North Dakota	1985	5% sales tax on candy, chewing gum, soft drinks with less than 70% fruit juice, and powdered drink mixes.	5
Rhode Island	1984	$0.04 paid by distributor per case (24 12-oz cans) of soft drinks, soda water, mineral water, and beer.	0.7
Tennessee	1963	1.9% of gross receipts from soft drinks and soft drink ingredients paid by manufacturers and bottlers.	12
Texas	~1961	6.25%sales tax on carbonated and noncarbonated packaged soft drinks, diluted juices, and candy.	160
Virginia	1977	Small excise tax on wholesalers and distributors sales of carbonated soft drinks.	0.1
Washington	1989	$1.00 per gal. of syrup	10
West Virginia	1951	$0.01 per half-L of soft drinks, fruit drinks, and chocolate milk. $0.80 per gal. of syrups paid by manufacturers or wholesalers.	13

Source: Jacobson & Brownell, 2000, Table 1.

In addition to the current taxes mentioned above, there are 12 cases of repealed soft drink and snack food taxes in US jurisdictions. In many cases, taxes were repealed as a result of lobbying by the soft drink and snack food industries, or in exchange for establishment of soft drink or food manufacturing plants within those jurisdictions (Jacobson & Brownell, 2000, Table 2).

Jacobson and Brownell (2000) suggest that nutritionally it makes more sense to tax foods based on the content of saturated or trans fat because of their contribution to heart disease, than to tax snack foods in general. However, legislative bodies find it more practical to tax well-recognized categories of food that play little useful role in nutrition. Soft drinks and snack foods fall in this category. Also it is useful to consider that for the purpose of obesity and obesity related diseases, all calorie rich foods are problematic, not just foods containing saturated fats.

Jacobson and Brownell (2000) imply that the revenue-raising feature of a "junk food" tax is more useful than its function for changing people's eating patterns. In addition, small taxes that do not significantly affect sales of taxable products are more politically feasible. However, Marshall (2000) discusses the use of taxes on saturated fats as a way of discouraging the consumption of unhealthy foods.

4.3 Goods and services tax exemption

Another approach to encouraging healthy eating through economic incentives is the Australian model that applies GST levies on prepared "convenience foods", but not on staple foods. In Australia, GST-free foods include: bread and bread rolls without a sweet coating; cooking ingredients, such as flour and sugar; fats and oils for cooking; spices, sauces and condiments; bottled drinking water, fruit juice or vegetable juice (>90% by volume); tea and coffee; baby food and infant formula; all meats (except in prepared meals or snacks); fruit, vegetables, fish and soup; spreads for bread; and breakfast cereals. Taxable foods include: cakes, pastries, pies, sausage rolls and other bakery products (but not bread or bread rolls); biscuits, crackers, cookies, pretzels, cones and wafers; savoury snacks, confectionery, and ice cream; carbonated and flavoured beverages and flavoured milk (but not fruit or vegetable juice); all food and drinks sold in restaurants or cafes; takeaways; food that is marketed as prepared meals; and any food not for human consumption including pet food (Australian Taxation Office).

The Australian approach appears to give preference to desirable nutrition outcomes. For example, bread rolls with sweet icings are taxed, but bread without icing is exempt, and fruit and vegetable juices are tax exempt, but sweetened and flavoured beverages are taxable. However, the Australian GST criteria do not consistently favour improved health outcomes. All ingredients for preparing food at home are tax exempt including all fats and sugars, giving no added incentive for preparing healthy and low calorie meals.

Canada employs a similar strategy for GST exemption on basic groceries. Most foods used for preparation at home are tax exempt. However, certain foodstuffs, such as, carbonated beverages, candies, confectionary, and snack foods, including potato chips, salted nuts and seeds, are taxed at 7% or 15% (Revenue Canada, 1997).

4.4 Other initiatives

Another example of a strategy for encouraging the development, sale and consumption of healthy foods is the Heart Foundation's "Pick the Tick" Programme. It aims to make it easier for consumers to make healthy choices when purchasing food. The Tick programme assesses food categories on certain nutrient criteria. The content of fats, sodium, and in some cases added sugar and/or dietary fibre are measured on a per weight basis. For example, to gain the Heart Foundation Tick of approval, breakfast cereals must contain <5g of fat per 100g; <400mg of sodium per 100g; <15g of added sugar per 100g; and >3g of dietary fibre per 100g (National Heart Foundation of Australia, 2004). Furthermore, to be approved, foods must add nutritional benefit to the total eating pattern.

Through its nutritional criteria and the widely recognised campaign and logo, "Pick the Tick" works as a guideline to consumers for healthy eating. The programme provides a useful model for how foods can be categorised and qualified according to certain health criteria.

4.5 Price elasticity of demand

Many of the current taxes are quite small and Jacobson and Brownell (2000) consider them to have negligible effect on consumption of these products. Some studies have attempted to assess the effects of price changes on consumption behaviour.

In a study looking at vending machine sales in the United States, researchers found that when the price of low fat snack products was reduced by 50%, sales of these products increased by 80% (from 25% to 46% of total sales). Sales of fatty snacks decreased modestly (French et al, 1997a). In a related study, the prices of carrots and fruit were reduced in high school cafeterias in the United States. In suburban schools, the price reduction led to twice as many bags of carrots being sold; in urban schools four times as much fruit was sold (French et al, 1997b).

A study in China examining the relationship between food price and consumption found that a 10% increase in the price of pork lead to an 11% decrease in daily fat intakes among the poor and a 5% decrease among higher income groups (Guo et al, 1999).

A wider literature review would turn up further studies on the effects of price changes on consumption behaviour. Some of these studies could be relevant to understanding the implications of a fat tax, although there appears to be no study to date of the behavioural changes that would result from a broad-based fat tax on high-energy or high-fat foods (Marshall, 2000).

5 Experience with alcohol and tobacco policy

In recent years in New Zealand, obesity has begun to be recognised as a major public health concern, with costs that burden families, communities, and the state health system. Similar to the obesity epidemic, smoking and drinking have also been targeted as harmful to public health. Policy interventions and strategies have been established to control both tobacco and alcohol. Because the control of both tobacco and alcohol share similar rationales with the anti-obesity campaign, it is worth considering the lessons learned from policy and tax regimes for reducing the consumption of tobacco and alcohol products in New Zealand.

5.1 Tobacco control strategies

Firstly, concern over tobacco use arose after epidemiological studies showed a relationship between smoking and various diseases. Smoking then became widely recognised in society as a significant public health issue. Similarly, epidemiological studies draw clear relationships between obesity and various diseases such as diabetes, heart disease, and cancer. In light of these studies there is increasing concern over the growing rates of obesity and the public health risk that this implies.

Having established that smoking was a public health concern, the external costs of tobacco consumption were discussed in terms of economic theory. The economic rationale of recouping external costs was a strong argument put forward in favour of governmental intervention. In response to these recognised risks and the externalities incurred, governments have been developing statutory interventions to discourage smoking for over 150 years, with the first efforts in New Zealand dating back to 1841 (Thomson, 1992). In the United States the reduction in smoking over the past several decades has been seen as one of the 10 greatest public health achievements of the 20th century (Mercer et al, 2003). Intervention strategies in New Zealand have led to similar reductions here as those achieved in the United States (*ibid*). Between 1970 and 1999 there was an approximate 60 percent decrease in tobacco consumption per adult in New Zealand (Allen & Laugesen, 2000).

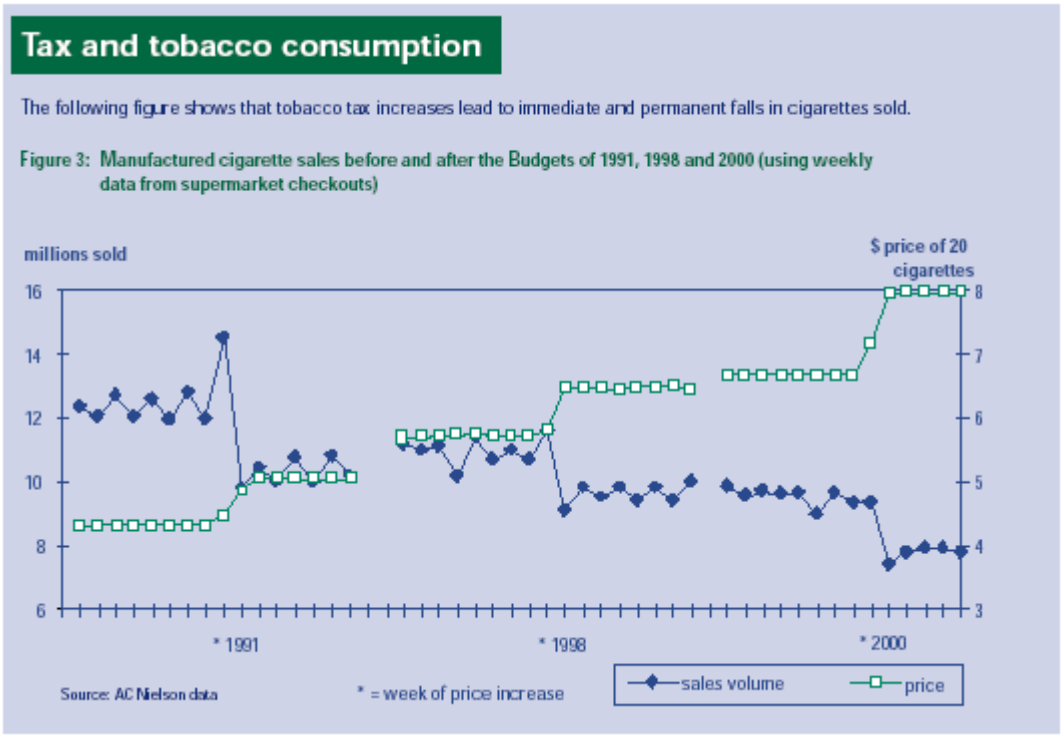
Over time, anti-smoking intervention strategies have developed into a comprehensive set of policies aimed at controlling tobacco. It is the broad range approach throughout different levels of society and the community that are likely to have made anti-smoking programmes so successful (Mercer et al, 2003). Interventions for tobacco use include media and education campaigns, advertising restrictions, warning labels on tobacco products, banning of tobacco industry sponsorship, banning of smoking in work places and public spaces, and increases in tobacco taxes. Also health intervention programmes are in place, which support people trying to give up smoking.

Most of these education and health strategies work best when the different programmes run in conjunction with each other. However, pricing strategies, such as tobacco tax, are thought to work somewhat independently of other intervention strategies (Mercer et al, 2003). Jha and Chaloupka (2000) state that tax increases are the single most effective intervention strategy for reducing demand for tobacco.

5.2 New Zealand's tobacco tax

Tobacco tax in New Zealand is currently 67-72% of the total price of a packet of cigarettes. Data suggest that there is a clear downward response in sales associated with increases in taxes. See Figure 1.

Figure 1. Effects of tax changes on purchases of tobacco products.



Source: Allen & Laugesen, 2000.

The excise tax on tobacco in New Zealand is indexed to the consumer price index (CPI) and adjusted annually to maintain the real price of tobacco products over time. Goods and Services Tax (GST) of 12.5% applies on top of the final price (Allen & Laugesen, 2000).

In the past 10 years, New Zealand has had three non-CPI increases in tobacco excise tax. In December 1995 there was an equalisation of tax, which corrected the difference between roll-your-own tobacco and manufactured cigarettes. This resulted in a 37.5 percent increase in tax on tobacco products other than manufactured cigarettes. Manufactured cigarette consumption increased slightly, whereas loose tobacco consumption decreased 18 percent. Overall, though, tobacco consumption did not change significantly (*ibid.*)

In 1998 there was a tax increase that resulted in a 10 percent increase in cost of tobacco products. This was followed by a 6 percent reduction in tobacco consumption (Allen & Laugesen, 2000). The price of tobacco products was raised again in May 2000 by about 20 percent due to increased excise taxes and price increases by tobacco companies. During the five weeks following this price rise supermarket data showed a 16 percent reduction in sales compared with the nine weeks prior to the price hike (*ibid.*). Data were not available to assess whether this reduction was permanent. However, previous tax hikes resulted in long-term decrease

in smoking habits, so it is likely that the 2000 price increase also resulted in long-term reduction in tobacco consumption. Since 2000 smoking prevalence has not declined appreciably (Fraser & Laugesen, 2004).

5.3 Public support for tobacco tax

In spite of evidence that excise tax on tobacco is very effective for reducing cigarette consumption, only 40 percent of people in New Zealand in a recent survey thought that higher taxes would help people stop smoking (Wilson & Thomson, 2002). In contrast 70 percent supported bans on tobacco advertising, 89 percent supported enforcement of laws prohibiting minors from buying tobacco, and 72 percent supported government funded smoking cessation programmes (*ibid*.). However, a more recent poll found that 71% of New Zealanders *supported* taxes on cigarettes (Hill Cone, 2003), evidently despite scepticism that such taxes would help people stop smoking.

Wilson and Thomson (2002) suggest that if the revenue raised from excise taxes on tobacco were invested more heavily in prevention and smoking cessation services, there would be higher public support for tobacco taxation. Smokers paid $938 million in tobacco tax in 2002, but only $14 million was spent on cessation services (Fraser & Laugesen, 2004). Investment in tobacco control by the government is less than 3 percent of the revenue raised from tobacco taxes (Wilson & Thomson, 2002). Wilson and Thomson are concerned about the ethical implications of this, especially considering the addictive nature of tobacco products.

5.4 Alcohol control strategies

Tax levied on alcohol also provides useful lessons and examples for the "fat tax" concept in New Zealand. The percentage of alcohol contained in beverages varies between types. A system of taxing alcohol has been established based on the actual amount of alcohol contained in a given drink. Drinks that contain more than 14 percent alcohol by volume have a base excise rate of $39.426 per litre of alcohol. Alcoholic beverages that contain less than 14 percent alcohol have a base excise rate of $21.647 per litre of alcohol (National Drug Policy). Some types of beverages containing less than 14 percent alcohol are also taxed a flat rate per litre of beverage (NZ Customs Service).

There are various statutes used as a basis for intervention in alcohol, which more recently have been coordinated and prioritised through the National Alcohol Strategy (Easton, 2002). The excise tax regime was updated in 2003, partly in response to Easton's (2002) suggestion that the role of prices in controlling liquor consumption needed to be given greater priority to strengthen the overall alcohol control strategy (National Drug Policy). The WHO promotes the taxation of alcohol as an effective public health tool for reducing harm related to alcohol consumption (Edwards, 2001).

Easton (2002) stresses that excise duties on alcohol should be part of a harm minimisation strategy rather than a revenue gathering strategy, although revenue gathering for the purpose of covering external costs associated with alcohol consumption is relevant. According to Easton, the strongest reasons for increased taxes on alcohol are:

- to relate market prices to external social costs;
- to moderate teenage drinking and heavy drinkers; and
- to discourage moderate and heavy drinkers from becoming very heavy drinkers and addicts.

These same reasons could equally apply to taxing unhealthy food.

6 Proposal for a fat tax in New Zealand

This chapter canvasses four options for implementation of a fat tax in New Zealand. The first option focuses on fats only and the second on snack foods, while the other two options would treat the energy content of fats and sugars equally, because it is excess energy in the diet that causes obesity, not fat or sugar per se. The chapter then identifies a preferred option, examines practical issues including possible exemptions from the tax, and discusses equity considerations.

6.1 Options for a fat tax

Option 1: Tax on fat content

The basic option is to tax fat content in foods. To reduce administrative and compliance costs, only on foods that exceed a certain threshold value would be taxed. The threshold value could be defined as a maximum amount of fat per 100g of weight, e.g. 9 grams. Lean grass-fed beef with fat trimmed off would typically be exempt, but meat with fat on would be taxed, as would takeaway hamburgers and other "fast food" and many snack foods. Other foods that would be taxed include butter and margarine, cooking oils, cheeses etc. Table 3 presents a number of common foods and their fat content, energy density (kJ/100g), and other information.

A variation, e.g. as proposed by Wilson and Mansoor (in prep), is a tax on saturated fats in New Zealand, because diets high in these fatty acids have been implicated in a number of serious health ailments, including coronary heart disease and diabetes. For this approach, the threshold value could be defined as a certain percentage of saturated fats as a share of total fat in the food product. Foods low in fat could still have a high percentage value, so an additional criterion would be desirable, based on saturated fat as a percentage of product composition (by weight). Energy density would provide an alternative basis for an exemption, e.g. foods with energy density exceeding a threshold value would be taxed based on their saturated fat content.

Option 2: Tax on snack foods and soft drinks

Another option for a "fat tax" is to target not fat per se but rather snacks and other foods, including soft drinks, that have little nutritional value and high glycæmic loading. Such a tax could be modelled on criteria used in overseas jurisdictions, such as the criteria used in Australia for food exemptions from GST (see section 4.3). In addition to targeting foods with high glycæmic loading, an advantage of this option is that it is easy to explain publicly and might be more likely than other options to garner public acceptance quickly. A disadvantage is that, once food categories are defined as subject to the tax, food manufacturers would try to re-define their foods to fit within exempt categories without necessarily improving the nutritional value of the food.

Option 3: Tax on energy content of all foods

Given that, in principle, all energy in food contributes equally to energy imbalance in diets and hence to health ailments from people being overweight, a third option is to tax all foods based on their energy content. Conceptually, this is the purest form of the tax and the form that would minimise the potential for creative labelling or other behaviour by food manufacturers designed to avoid having to pay the tax.

Table 3. Fat content and energy density of selected food items.

Product	Total fat/ 100g	Sat. fat/ 100g	kJ/ 100g	Total fat/ serve	Sat. fat/ serve	kJ/ serve
Coca-cola	0.0	0.0	180	0.0	0.0	360
Fresh Up Crisp Apple juice	<1	0.0	182	<1	0.0	455
Dolmio Bolognese Mushroom sauce	0.3	<0.1	171	0.4	<0.1	243
Kelloggs Coco-pops	0.3	0.2	1603	<0.1	<0.1	481
Sanitarium Skippy Cornflakes	0.4	0.2	1530	<0.1	<0.1	459
Anchor skim milk (99.5% fat free)	0.5	0.4	180	1.0	0.8	340
Pam's tuna chunks in water	0.5	0.2	390	0.3	0.1	260
Tararua lite cottage cheese	0.5	0.3	340	0.3	0.2	152
Wattie's baked beans	0.6	0.1	435	1.2	0.2	915
Yoplait Original Strawberry yogurt	0.9	0.4	380	0.3	0.2	380
Family Choice High Grade Flour	1.2	0.2	1483	1.2	0.2	1483
Sanitarium Weetbix	1.3	0.3	1480	0.4	0.1	444
Sanitarium So Good soymilk	1.5	0.2	220	3.8	0.5	550
Family Choice Wheatmeal Flour	2.1	0.3	1420	2.1	0.3	1420
QualityBakers White Sandwich bread	2.1	<1	1050	<1	<1	320
Naturalea plain unsweetened yogurt	3.1	2.1	242	0.3	0.2	325
Anchor whole milk	3.3	2	255	7	5	515
Vogel's kibbled grain and rye	3.4	<1	870	1.4	<1	370
Chicken breast (no skin) – roasted[a]	3.6	1.0	690	na	na	na
Tararua traditional cottage cheese	4.0	2.8	400	2.0	1.4	200
Diamond Macaroni and cheese (when prepared)	4.7	2.8	640	9.5	5.6	1280
Bean Supreme tofu	7.3	1	537	5.5	1	403
Chicken breast (with skin) – roasted[a]	7.8	2.2	824	na	na	na
Sirloin steak lean, no fat, grilled[b]	7.8	3.1	766	na	na	na
Eggs[a]	9.9	3.1	617	5.1	1.6	318
McDonalds cheese burger[c]	11.8	5.0	1161	14.0	6.0	1381
Kiwi middle bacon	12.0	4.8	742	6.0	2.4	371
Sirloin lean, fat trimmed, grilled[b]	13.3	5.8	943	na	na	na
Kentucky fried chicken[c]	13.5	3.4	993	na	na	na
McDonalds french fries-large[c]	14.8	2.8	1284	26.0	5.0	2261
Sirloin steak lean, with fat on*[a]	15.0	6.4	1005	na	na	na
Leg of lamb lean and fat-roasted[a]	15.6	7.6	1029	na	na	na
Moro bar	15.6	11.7	1830	na	na	na
Mother Earth Meusli Bar	15.6	9.9	1740	5.1	3.2	565
Tegel chicken sausages	16.0	5.3	934	9.3	3.1	542
Pork chops-centre loin, pan fried[a]	16.6	6.0	1159	na	na	na
Mainland edam cheese	26.4	18.2	1465	5.2	3.6	293
Eta mayonnaise	30.1	4.9	1440	7.5	1.2	360
Bluebird Originals Salt and Vinegar potato chips	35.3	15.9	2160	15.9	7.2	970
Mainland tasty cheese	36.7	25.4	1803	7.1	5.1	361
Sanitarium crunchy peanut butter	51.5	8.5	2440	7.7	1.3	396
Olivani Monounsaturated spread	75.0	15.0	2790	3.8	0.8	140
Anchor butter	81.5	53.0	3030	4.1	2.7	152
Sunfield canola oil	99.0	7.4	3730	15.0	1.1	560

* Indicates that the meat itself is low in intermuscular fat, but that fat has not been trimmed from the edge of the cut. All data taken from food product labels except as follows: [a] United States Dept of Agriculture, 2004. [b] Crop and Food Research (n.d.) and [c] chowbaby.com.

This third option has two major drawbacks. First, it would affect virtually all food products and therefore impose compliance costs on a very large number of businesses in terms of requirements to calculate the amount of tax owed and submit fat tax returns. The distribution of compliance costs would vary depending upon whether the tax obligation were on a) retailers, b) distributors, or c) food processors, manufacturers and importers, but in any of these scenarios the compliance costs could be significant. Some products would incur only very small amounts of tax, so in practice this option would need to have a *de minimis* level of energy before tax was payable.

The other major disadvantage of this approach is that it treats all energy content in food as bad, failing to recognise that a moderate amount of energy is essential. Ifthis were the only effective way to design a tax, it might be worth accepting this cost in order to gain the advantages of a fat tax, but it would be preferable to design a tax to avoid this disadvantage while still achieving the main objectives.

Option 4: Tax foods with high energy density

The fourth option, then, is to tax only those foods with high energy density, i.e. foods where energy exceeds a certain percentage of the total weight of the food. Variations on this approach could involve taxing saturated fats at a higher rate, due to their wider linkages with adverse health conditions, or differentiating the tax on the basis of a food's glycæmic index value or glycæmic load per serving. For example, foods with a low GI value could be exempt from the tax as long as they were also low in saturated fat. These possibilities merit further analysis, but are not considered further here, in part because of difficulties inherent in determining serving sizes for food ingredients such as flour, cooking oil and sugar.

Barbara Rolls, a leading expert on energy density, diet and nutrition, has recommended that people be moderate in their consumption of any food that has an energy density exceeding 2 calories per gram, equivalent to about 840 kJ/100g (Rolls, 2003). Although further analysis is required to confirm an appropriate threshold, this would seem about the right level for a definition of high energy density.

Using ED avoids the problem of trying to classify food products into categories that are subject to different rates of tax, and avoids having to define serving size (which would be necessary if glycæmic load were used as a criterion, for instance). If a food exceeds a maximum ED, tax would be payable per unit of energy.

On the other hand, using only ED as a criterion has some drawbacks. A soft-drink such as Coca-cola® has a low ED (180 kJ/1000g) and would therefore be exempt. However, a basic food product such as white flour is moderately high, at 1480 kj/100g, higher than a McDonalds® cheeseburger (1161 kJ/100g), so if the threshold is set to tax the cheeseburger, flour would also be taxed. See Table 3. This is discussed further in the next section.

6.2 Discussion of options

Given the nature of the obesity problem, a tax on foods with high energy density (ED) would be the most direct approach. Food products with low to medium ED, i.e. most food products, would be exempt. This recognises that a moderate amount of fat and sugar in the diet is healthy, and also reduces compliance costs for businesses.

Compliance costs would be further reduced by taxing only final products for sale to consumers, and by exempting small businesses (see next section).

However, this approach would result in a tax on staples such as flour, while exempting energy dense/nutrition poor beverages such as soft drinks. Furthermore, obesity and diabetes are not the only health conditions that would be ameliorated via a well-designed fat tax. In particular, the incidence of coronary heart disease could fall if consumption of saturated fats were reduced. This suggests that multiple criteria would be appropriate. For example, it might be possible to combine the concepts of energy density and glycæmic load, for instance, or to use energy density but exempt a range of staple foods.

A simpler approach, and one that is easier to understand and therefore more viable politically, would be to have one set of criteria for fat content (or possibly just saturated fat) and another set of criteria for soft drinks, snacks and other foods that are "energy dense and nutrition poor", i.e. implementing both Option 1 and Option 2 as described in the previous section. Separate criteria for high energy soft drinks would be justified by the fact that these "empty calories" do not appear to reduce consumption of solid food (McCrory et al, 2002).

Regardless of the precise criteria chosen, food manufacturers are already required to assess the fat and energy content of most products and print this information on the label. Hence the information necessary to calculate and pay the tax is already available. The additional compliance costs would consist mainly of completing a tax return reporting how many of each taxable food product was sold in the period and multiplying this times the tax payable on each item. Sales volume data of individual companies would be kept strictly confidential to protect commercially sensitive information.

A fat tax provides an incentive for food manufacturers to reduce the fat and energy content of foods that exceed threshold values. These manufacturers could be expected to reduce fat and energy to just below the thresholds, so the thresholds should be set at levels that food and nutrition experts are comfortable with. If a political compromise were to result in exemption of some moderately-high energy or high fat foods, it might be necessary to change the definition by lowering the thresholds in a few years time. This would impose additional costs on business if done quickly or without sufficient notice, but it could also be used as a transition strategy for phasing in a fat tax over time, if done openly and transparently.

6.3 Setting the level of the fat tax

Insurance premium vs. adjusting for externalities

How the fat tax rate is set depends on whether one uses the insurance premium approach or an externality approach.

The externality approach would be challenging to implement, because done properly it would include all of the intangible costs of debilitating illness and premature deaths (see section 3.4 above), as well as the costs of treatment less the savings from not having to treat other conditions that would arise if diabetics and heart disease victims had lived longer.

To be rigorous, one should also include the intangible costs suffered by people who will not get sufficient or timely treatment of their medical conditions because the diabetes epidemic will have displaced them in the health sector's priorities. One could assume, of course, that government health funding will increase to meet this demand, and undoubtedly some increase will occur. But it would seem equally certain that, if the costs of services to people with diabetes rise to $1 billion per year by 2021, there will be some displacement of treatment for other medical conditions in the absence of a fat tax to fund the rising cost of services to people with diabetes.

Estimating all of these externalities caused by high fat and energy-dense diets would be time-consuming, costly and subject to controversy due to uncertainty of future medical costs and the subjective nature of factors such as the value to society of an extra year on a person's life.

A more straightforward approach is to set the fat tax based on the insurance principle, although this also requires further research and analysis. Basically, this approach assumes that rising treatment costs for medical conditions linked to high fat and energy-dense diets would be funded through the fat tax, and therefore no displacement of treatment of other illnesses would occur.

Revenue target for a fat tax

Under the insurance approach, the tax rate should be set at a level that raises sufficient revenue to pay for the additional costs to the health system from medical conditions linked to diets high in saturated fats and energy-dense, nutrition poor foods. Because type 2 diabetes and heart disease take many years to develop, the insurance principle suggests that the fat tax should be based on the medical costs likely to be incurred in the future when all latent cases caused by current consumption patterns have emerged and require treatment.

In practice, of course, this amount can only be estimated. Current costs of treating diabetes have been estimated at $247 million per year, with costs predicted to rise to $1 billion annually by 2021 (PWC Report, 2001). Given that 80% to 90% of cases are type 2 diabetes, i.e. strongly linked to diet, the future costs of treating today's latent and emerging cases of type 2 diabetes would be at least $200 million per year, and probably closer to $800 million per year. The costs of treating coronary heart disease and other medical conditions associated with poor diets would be additional.

As a rough starting point, then, a fat tax that raised revenue on the order of $1 billion per year would appear to be justified.

A tax of this magnitude might not be politically feasible, as it amounts to roughly $5 per person per week. On the other hand, it is roughly of the same magnitude as the proposed carbon charge on greenhouse gas emissions and, like that charge, its impact on households could be offset by a reduction in other taxes. For instance, revenue of $1 billion would be sufficient to reduce GST by up to 2%, i.e. to 10.5%, or to fund a 3% cut in the bottom tax rate of 19.5% on personal income up to $38,000, which would benefit virtually all taxpayers (Sinner and Salmon, 2003). Alternatively, some of the revenue could be used to eliminate GST on all fresh fruit and vegetables. In any event, the revenue target of $1 billion serves to underline the magnitude of the problem and demonstrates that the upper limit on the tax could be what is politically feasible rather than what can be justified on a rational basis.

More detailed analysis of New Zealand food consumption patterns would be required to determine the tax to be levied per gram of fat in high fat foods and per kilojoule in energy-dense foods. To obtain the tax rate in dollars pergram of fat, for example, the revenue target for the fat tax would be divided by the total fat content of all foods subject to the tax. This would depend on the threshold for the tax and the extent of any exemptions granted to certain foods. Exemptions for certain food types are among the issues discussed in the next section.

6.4 Implementation – practical issues

All of the fat tax options identified above raise a number of practical issues regarding how such taxes would be implemented. Of particular importance are the following:

- What food types should be exempted from the tax
- What businesses would be required to calculate and pay the tax
- What businesses might warrant an exemption
- How to assess the tax on meat products, which vary in fat content as they move through the food distribution chain
- What would be done with the revenue.

Exemptions for fruits, vegetables and Omega-3 fatty acids

Healthful foods that are typically underrepresented in New Zealand diets, in particular all raw fruits and vegetables, should be exempted from a fat tax. Most of these would be exempt anyway, if threshold values were applied to saturated fat content or energy density, although some fruits have moderately high energy densities.

In addition, all Omega-3 fatty acids, such as those found in seafood, should be exempted from any fat tax and excluded from any calculation of energy density for the purposes of determining whether a food is exempt by being under a threshold value. It might even be desirable to allow Omega-3s to offset the presence of other fatty acids on a one for one basis. For example, a product with 10g of total fat, divided between 2g of Omega-3 and 8g of other fats, would be assessed as having only 6g of fat.

Nuts in their raw form (e.g. not salted) could also be considered for an exemption, in recognition of the relatively healthful oils they contain. Similarly, further consideration should be given to whether some or all polyunsaturated fatty acids (PUFAs), for example CLA, should be exempted from a fat tax. It must be borne in mind, however, that these fats are still high in calories and can contribute to obesity in unbalanced diets. Raw nuts are unlikely to be a problem, but excessive consumption of PUFAs could be.

Tax obligations in the food distribution chain

A basic implementation question for any proposed new tax is the "point of obligation", i.e. who will be required to calculate and pay the tax. For the fat tax proposed in this report, the most practical point of obligation is the wholesaler. This would be defined as the business entity that sells a food product to a retail business, and would include any food manufacturer that sells directly to consumers. Thus, any

food manufacturer, importer or food wholesaler that sells product to supermarket chains and other retail outlets would be liable to calculate and pay the fat tax. These wholesalers would file returns on a regular basis much as they do now for the goods and services tax (GST). Supermarket chains, small groceries and dairies, restaurants, take-aways and other retail vendors would have tax obligations only if they sold fresh meats (see below).

To avoid imposing compliance costs on a large number of small retail operations, all such businesses with sales less than a certain amount, say $250,000 per year, would be exempt. Ingredients sold to food manufacturers would be also exempt, because these do not meet the above definition of "wholesale", but the manufactured product would be subject to the tax unless the product qualified for an exemption.

Assessing a fat tax on meat products

Defining a point of obligation for fresh meat poses a particular difficulty, because fat content varies from one cut to the next and also can change as the meat moves through the distribution chain. Most meat cuts in New Zealand are sold through supermarkets, which perform trimming and packaging operations at regional distribution centres. A smaller proportion of meat is sold through local butcher shops, which typically acquire carcases and trim excess fat as the meat is cut and prepared for sale. To take this into account, the tax obligations for meat products would be payable by the retailer except for pre-packaged products such as salami and paté, which would be taxed at wholesale the same as other foods.

The New Zealand meat industry operates a quality assurance programme for beef and lamb in which meat cuts that are trimmed to have less than 5 mm of external fat can be advertised and sold with the industry quality mark. The quality mark carries the endorsement of the National Heart Foundation's "Pick the Tick" programme. Once allowance is made for Omega-3 fatty acids (and possibly other beneficial fatty acids, see above), it could be that all meats with the quality mark could be exempted from the fat tax. If the quality mark were to be used as the basis for an exemption, its application would need to be audited independently of the meat industry.

For cuts that do not achieve the quality mark, research would need to be done on the typical amount of fat consumed for various cuts of meat, based on a representative sample of cuts that did not achieve the quality mark, and a fat tax could be applied on this basis.

Pork and poultry products are not covered by the beef and lamb quality mark programme, and for cultural reasons these products are typically sold with more untrimmed fat than are beef and lamb. Some of this fat is trimmed off by the consumer either before or after cooking, and hence not ingested. The pork and poultry industries do not have formal quality mark programmes. However, the pork industry promotes a "Trim Pork" range that has less than 5mm of external fat and some chicken and turkey products get the National Heart Foundation's "Tick" of approval. These could be assessed and formalised as the basis for either an exemption or a low rate of fat tax, depending on the amount of fat present. For cuts that do not achieve a defined quality specification, research would need to be done to determine the typical amount of fat and therefore the appropriate level of tax.

A similar approach would be taken for deer and other meats. In the absence of a quality mark certifying a "trim" cut to have less than a specified amount of fat, typical fat content would be determined and an appropriate tax levied.

Fresh seafood would be assessed in the same way, but given its prevalence of Omega-3 fatty acids it would be more likely to achieve an exemption than meats.

For processed meats, e.g. mince and sausages, fat content would need to be determined and assessed by product type. Each type could be further differentiated by fat content. For instance, mince that is less than 5% fat could have one tax rate, less than 15% fat a second rate, etc. The categories and what they are called should be determined in consultation with industry. Such meat products claiming anything other than the highest fat category would need to be labelled with their fat content, as most mince is now, and would be subject to random compliance audits.

Grass-fed livestock tends to be lower in saturated fats and have less intermuscular fat than grain-fed livestock. If other countries were to adopt fat taxes, New Zealand beef and lamb could gain a marketing advantage and command a premium in those markets.

Use of fat tax revenue

Given that the rationale for a fat tax is based on the concepts of externalities and insurance premiums, net revenue from the tax should be used to fund interventions to reduce the incidence of obesity and related health conditions.

Strictly speaking, dedicating the revenue in such a way is not appropriate according to fiscal principles. If health interventions are worthy of government expenditure, they should proceed regardless of the source of the revenue, which should come from the source that is least distorting to economic activity.

In this case, however, it is the absence of a tax that is distorting efficient economic activity, i.e. leading to externalities from diabetes and other health conditions linked to poor lifestyle choices. If additional interventions to address obesity and related health conditions are not warranted, i.e. because it is determined that the benefits do not exceed the costs (this is almost certainly not the case; see PWC, 2001), the fat tax should still proceed but the revenue should be returned to consumers through lower income taxes (see next section). This would serve to correct distortions (i.e. externalities) associated with energy-rich food while reducing distortions caused by income taxes.

As discussed in the next section, the most appropriate use of the revenue might well be a mix of health care interventions and income tax reductions for low-income households.

6.5 Distributional and equity issues

Any proposal for a new tax requires consideration of the potential impact of the tax on different segments of the population.

A fat tax would be different in some respects than taxes on alcohol and tobacco, of course. A family can avoid being taxed on alcohol and tobacco by not purchasing those products. With a fat tax, a family could minimise its tax burden by not

purchasing soft drinks and sausages, but it would still pay some tax on basics such as butter and oil. Furthermore, some of the tax revenue could be used to subsidise the purchase of fruit and vegetables, either for low-income households or all consumers. However, an analysis of the feasibility of such a programme is beyond the scope of this report.

An alternative would be to return the amount of tax paid by a typical low-income household to those families by reductions in income tax rates. This would mean that those families that chose to consume more than the average would help to fund diabetes interventions through the health care system, while those who ate healthy diets would come out ahead.

Low-income people tend to be over-represented in the incidence of obesity and diabetes (MoH, n.d.), as are Maori and Pacific Islanders. A fat tax, by helping to fund interventions to reduce the incidence of obesity and diabetes and to improve treatment forpeople with diabetes, will have positive distributional impacts for these groups (Strnad, 2004).

Finally, equity is not just about helping disadvantaged groups. More fundamentally, it is about fairness. As already discussed (see 3.2 above), there is a basic principle of fairness involved in making people take some responsibility for their dietary choices, including paying a share of the consequent medical costs, so that people who adopt more healthy lifestyles do not find that their access to high quality and timely health care is limited because of the costs of treating the epidemic of diabetes in New Zealand. A fat tax can help to slow down, and hopefully reverse, that epidemic, while funding at least a portion of the cost of medical care for the next generation of people with diabetes.

7 Recommendation for a Select Committee enquiry

This report presents the case for a tax on high fat and energy-dense/nutrition-poor foods and describes options for how such a tax could be defined and targeted. More work is required, however, before such a tax could be implemented, including resolution of political as well as technical issues.

We recommend a Select Committee enquiry, with opportunity for extensive public input, to explore and resolve these issues. Questions that should be addressed by the enquiry are set out below.

Criteria for the fat tax

Chapter 6 presented four options for a fat tax and concluded that the best approach might be to implement both option 1, a tax on high fat foods, and option 2, a tax on soft drinks, snack foods and other "energy dense/nutrition poor" foods. Further analysis and discussion are required to confirm whether this approach is the most appropriate. Whatever the general approach, specific criteria and threshold values would then need to be set, e.g. the maximum amount of fat per 100g to remain exempt from the fat tax.

Exemptions

This report recommends that all fruit and vegetables should be exempt from the fat tax, and that all Omega-3 fatty acids should be excluded from calculations of fat and energy content. Some questions requiring further consideration include:

- Should raw nuts be exempted?
- Should other polyunsaturated fatty acids, in addition to Omega-3, be excluded from the calculation of fat content?

Revenue targets

As discussed in the previous chapter, the tax rate or rates should be set based on the amount of revenue to be raised. The Select Committee enquiry should set a revenue target and recommend how much should be raised by a fat tax and how much by a tax on soft drinks and other energy-dense/nutrition-poor foods. The overall target should be based on three factors:

- The expected future costs of treating diabetes, heart disease and other health conditions linked to high fat and energy dense diets;
- The amount of funding to be dedicated to new health interventions, such as improved early treatment of people with diabetes and possible subsidies (or GST exemptions) for fresh fruit and vegetables;
- The amount of revenue to be returned to taxpayers via reduced income tax or reduced GST, in order to minimise the impact on low-income households.

Impacts on different groups

The impacts of a fat tax on different groups in the New Zealand population will need to be considered. Population studies could be done to assess the energy density of the total diet for different population groups. This could include not only groups of

different body weights, but also groups at nutritional risk such as the elderly (Rolls, 2000). Any analysis should consider overall well-being and include improved health outcomes as well as financial impacts.

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