



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Center for International Food and Agricultural Policy



Research, Food and Nutrition, Commodity and Trade,
Development Assistance, Natural Resource and Environmental Policy

Food and Health: A European Perspective

by

Luciano Venturini
Universita Cattolica del Sacro Cuore

Center for International Food and Agricultural Policy
University of Minnesota
Department of Applied Economics
1994 Buford Avenue
St. Paul, MN 55108-6040
U.S.A.

Food and Health: A European Perspective

Luciano Venturini

Universita' Cattolica del Sacro Cuore, Largo A. Gemelli, 1 20123 Milano, Italy. Department of International Economics, Via Necchi 5 20123, Milano, tel. +39-02.7234.2692; fax. +39-02.7234.2475. Institute of Food Economics, Via Emilia Parmense, 84 29100 Piacenza, tel. +39-0523.599.225.

E-mail: luciano.venturini@unicatt.it

10th Joint Conference on Food, Agriculture and the Environment

**August 26-30, 2006
Duluth, Minnesota**

Abstract

This paper addresses four issues which arise from increasing concerns about overweight and obesity in European countries. First, we explore the main stylized facts of the phenomenon. We show that although Europeans are not obese like Americans, there is robust evidence that adult and childhood obesity rates tend to increase substantially in many European countries. The second part of the paper surveys the recent theoretical literature on the economics of obesity. In particular, we focus on the debate about the merits and limits of public policies in this area. This paper presents an alternative perspective from that suggested by the rational-choice approach according to which government intervention is not necessary. We emphasize the potential positive role of well-designed public policies by emphasizing that in a world with less than perfect information, externalities, self-control problems, endogenous preferences and social inequalities, the equivalence between individual choice and individual as well as social welfare is weakened. We suggest that the right framework for thinking about public policy in this area is a multi-factor and multi-stakeholder approach. This approach casts some doubt on the notion of a strict link between determinants of weight gain and the choice of policy tools to tackle the phenomenon. We argue that just the multi-factor nature of the obesity phenomenon allows to identify several instruments and policy tools. Several non-food policies targeted to different purposes such as environmental issues, social cohesion, and urban planning can also have useful consequences in mitigating weight gain. Thirdly, we explore the determinants of European obesity patterns. In particular, we examine the relevance for Europe of the food consumption hypothesis recently developed by Cutler, Glaeser and Shapiro according to which technological change easing access to food plays a key role as a determinant of weight gain. It is argued that this hypothesis can provide a plausible explanation for overweight and obesity patterns in Europe, although we also find that in some countries there is evidence of weight gains in the absence of significant increases in food calorie intake. Finally, the paper proceeds to examine current policies in Europe at both national and European Union level and the implications of the findings for addressing more effective policies.

Introduction

There is no question that food can have relevant consequences to health. But, to be sure, the relation between food and health is a very complex issue. There are several ways in which food consumption may affect health. Firstly, and more traditionally, the issue can be analyzed in terms of food safety, namely the need of avoiding the presence in foods of ingredients and substances with negative health consequences such as toxins, additives, pesticides and bacteria. A further dimension regards the problems of unknown risks, real or perceived, related to new technologies, such as GMO, radiation, or microwave technologies. While this channel for the relation between food and health is often associated to the food safety issue, it seems more appropriate to distinguish it from food safety to emphasize its specificity. Another dimension regards protecting against illnesses caused by malnutrition and deficiency diseases caused by insufficient intake of

vital nutrients.¹ Finally, an increasingly relevant area regards food and diet as important determinants of health outcomes. Perhaps, it is not that the diet problem is literally a matter of life or death as argued by Smith (2004) but indeed, overweight and obesity are growing health concerns in many countries. Diet-related diseases are increasingly significant causes of disability and premature death. Overweight and obesity (O&O) are a major risk factor for many chronic diseases such as hypertension, cardiovascular disease, certain cancers, strokes, respiratory diseases and type-2 diabetes as well as cognitive conditions, such as Alzheimer's disease. Not only O&O have a negative impact on public health, but they also pose a huge burden to the economy. Obesity related illness are estimated to take up 7% of national health budgets in the EU annually (Robertson et al., 2004).

The price of obesity becomes even higher when indirect costs such as reduced productivity, demands on insurance and social security, and social exclusion are taken into account. Tackling obesity is therefore an essential part of the work to meet the Lisbon Agenda objective of boosting EU competitiveness.

Overweight and obesity levels are increasing and in several countries this happens at an alarming rate, particularly among children and adolescents. Several chronic diseases which are now recognised as being linked to dietary and lifestyle factors tend to increase significantly. Obesity is one of the most serious public health problems in Europe because it increases significantly the risk of many chronic diseases such as cardiovascular disease, type 2 diabetes and certain cancers. Today, these diseases represent the biggest burden of diseases and are the leading cause of mortality in Europe (Eurodiet, 2000; European Commission, 2006).

While it is clear that food can harm health, two very complex issues remain open. Should harmful effects be addressed and can health be promoted through public policies? What is the role of food and nutrition policies in this context? There also is a vivid theoretical debate about the determinants of the phenomenon with important policy implications. In this paper, we focus on this latter issue and examine the role of dietary patterns and food choices as determinants of weight gain.

The paper proceeds along the following steps. First, in Section 2, we identify the main patterns and stylized facts of O&O in Europe. Section 3 provides a review of the literature on the determinants of O&O and their policy implications. Section 4 deals with the question of how to explain the differences in O&O among European countries, as well as the ones between the US and EU. In particular, we investigate whether food over-consumption may help explain weight gains. In Section 5, we examine the European Union Commission's proposals and initiatives and consider the implications of the findings for the development of EU interventions. Section 6 concludes.

2. Overweight and obesity in Europe: patterns and stylized facts

Before going any further, it is worth looking at the data regarding O&O in Europe. The data reported in Table 1 are taken from the OECD Health 2005 database. They present the prevalence of obesity in OECD countries from 1980 through 2003. Obesity is measured by the body mass index (BMI), the most frequently used measure of overweight and obesity, which is a single number that indicates an individual's weight in kilograms divided by height in meters squared. Based on the WHO current classification, individuals with a BMI between 25 and 30 are defined as overweight,

¹ Despite the increasing abundance of food, deficiency diseases continue to constitute a problem even in developed countries. In the EU, many people may suffer from insufficient access to healthy food of high nutritional value. For instance, people in low-income groups tend to spend a greater proportion of their disposable income on food, but eat a diet of lower nutritional quality than people in high-income groups. Recent dietary surveys suggest that, to various degrees, there are continuing problems of deficiencies in micronutrients such as iron and iodine.

and those with a BMI over 30 as obese. Table 1 allows to examine country differences in patterns and trends of the percentage of adult population with a BMI>30 kg/m².

It is important to note that the existence of differences in data collection methodologies limit data comparability.² Despite these problems, the data in Table 1 provide in some way consistent measures of obesity over time and across countries.

It is immediate to see the existence of wide variations in obesity across countries. The table confirms that the US present the highest prevalence of obesity in the OECD. The European picture is not quite as clear-cut because of wide variations across European countries. It is apparent that European countries have lower obesity rates than the US. While more than 30% of the adult population in the United States is now considered to be obese, no European country has reached such extraordinarily high levels of obesity, although in the UK (as well as in Greece) the rates are close to the US ones. The prevalence of obesity ranges from about 22 per cent in the UK and Greece, down to 8-9 per cent in Italy and France, and 13 per cent in Germany and Spain.³

While most European countries still have relatively low prevalence of obesity, some countries exhibit an increase over the period. The rate of obesity has more than doubled over the past twenty years in the United States but it has more than tripled in the United Kingdom. The obesity rate in many EU countries has also increased substantially over the past decade. The prevalence of obesity has almost doubled in Denmark, Finland, France, Netherlands, Spain and Sweden. This means that while the UK is converging to the US levels, in much of European countries obesity prevalence increased at rates similar but slightly lower to those of the US so that there is no evidence of a reducing gap. It is also interesting to note that in Finland and Netherlands, the increase in obesity rates is concentrated in the 1990s. By comparison, obesity rates in the US and in the UK increased strongly already in the 1980s. The WHO estimated that if prevalence continues to increase at the same rate as in the 1990s, about 150 million adults in the European Region will be obese by 2010. Currently they are about 130 million (WHO Europe, 2005).

It may be misleading, however, to take into account obesity alone. As noted by the IOTF⁴, risks to health increase progressively from well below the standard overweight threshold and it is a fallacy to assume that only the extremes of obesity should be a cause for concern over health (IOTF, 2003).⁵

Table 2 shows two interesting facts. First, while obesity rates in Europe are lower than in the US, the evidence is different for overweight rates. In most European countries these rates are very close,

² For most countries, data on obesity are self-reported through population-based health interview surveys. Estimates from health examinations are generally higher and more reliable than those coming from health interviews. Self reported surveys tend to underestimate true prevalence. The Organization of Economic Cooperation and Development (OECD) has recently acknowledged that estimates of obesity rates in many OECD countries considerably under-estimate the true prevalence of obesity because of reporting biases (OECD, 2005).

³ It should be noted that the high rates of obesity rates in the US and the UK (as well as in Australia) at least in part may depend on the fact that for these countries the estimates are based on the actual measure of height and weight, not on self-reported data.

⁴ The International Obesity Task Force (IOTF) is part of the International Association for the Study of Obesity, a non-governmental organization registered as a charity in England which has a formal role of collaboration with the World Health Organization.

⁵ It is, however, possible to find in the literature different views as well. Flegal et al. (2005), for example, found that overweight individuals live slightly longer than normal weight ones.

TABLE 1. COUNTRY DIFFERENCES IN LEVELS AND TRENDS OF OBESITY PREVALENCE, PERCENTAGE OF ADULT POPULATION WITH A BMI>30 KG/M2

	1980	1990	2000	2001	2002	2003
Australia	8.3 d	10.8 ¹ d	21.7 ¹ d	21.7 ² d	21.7 ³ d	..
Austria	..	8.5 ¹	9.1 ¹	9.1 ²	9.1 ³	..
Belgium	11.7 ¹	11,7	11.7 ¹	11.7 ²
Canada	13.9 ¹ b	13.9 b	13.9 ¹ b	14,3
Czech Republic	..	11.2 ³	14.2 ¹	14.8 ¹	14,8	14.8 ¹
Denmark	..	5.5 ³	9,5	9.5 ¹	9.5 ²	9.5 ³
Finland	7,4	8,4	11,2	11,4	11,8	12,8
France	..	5,8	9	9.0 ¹	9,4	9.4 ¹
Germany	11.5 ¹	11.5 ²	12.9 ¹	12,9
Greece	21.9 ³	21.9 ²	21.9 ¹	21,9
Hungary	18,2	18.2 ¹	18.8 ¹	18,8
Iceland	..	7,5	12.4 ²	12.4 ¹	12,4	12.4 ¹
Ireland	10.0 ²	13.0 ¹	13	13.0 ¹
Italy	8,6	8,5	8,5	8.5 ¹
Japan	2	2,3	2,9	3,2	3,6	3,2
Korea	3.2 ¹	3,2	3.2 ¹	3.2 ²
Luxembourg	16,3	17,9	17,3	18,4
Mexico	24,2	24.2 ¹	24.2 ²	24.2 ³
Netherlands	5.1 ¹	6,1	9,4	9,3	10	10.0 ¹
New Zealand	..	11.1 ¹	17.0 ³	20.9 ²	20.9 ¹	20,9
Norway	6.4 ²	8.3 ¹	8,3	8.3 ¹
Poland
Portugal	12.8 ¹	12.8 ²	12.8 ³	..
Slovak Republic	..	18.9 ³	16.2 ²	22.4 ¹	22,4	22.4 ¹
Spain	..	6.8 ³	12.6 ¹	12,6	12.6 ¹	13,1
Sweden	..	5.5 ¹	9,2	9,2	10,2	9,7
Switzerland	..	5.4 ²	7.7 ²	7.7 ¹	7,7	7.7 ¹
Turkey	12.0 ³	12.0 ²	12.0 ¹	12
United Kingdom	7.0 d	14.0 ¹ d	21.0 d	22.0 d	22.0 d	23.0 d
United States	15.0 ² d	23.3 ¹ d	30.5 d	30.5 ¹ d	30.6 d	30.6 ¹ d
NOTES						
a) -1, -2, -3, 1, 2, 3 shows that data refers to 1, 2 or 3 previous or following year(s).						
d) "b" means there is a break in the series for the given year; "d" means there are differences in methodology.						

Source: OECD HEALTH DATA 2005, October

if not greater than in the US. This is a peculiar trait of Europe. While in the US overweight and obesity rates are substantially similar (the ratio is 1.1), in Europe the percentage of overweight people may be 2-3-4 times the percentage of obese. In other words, Europeans are as overweight as Americans. Austria, Germany, Greece and the Czech Republic all have overweight rates greater than the US ones. A second interesting fact emerging from Table 2 is that, while obesity rates present a high degree of heterogeneity across European countries, overweight rates are much more similar. This also means that even countries where obesity levels are low tend to present high rates of overweight. Finally, as a clear consequence of relatively higher overweight rates, Table 2 shows that O&O affects a very high percentage of European population.

TABLE 2. OVERWEIGHT AND OBESE POPULATION AGED 15 OR MORE

COUNTRY	YEAR	OVERWEIGHT	OBESE	O&O	OVERWEIGHT/ OBESE
Austria	1999	37.0	9.1	46.1	4.1
Belgium	2001	32.7	11.7	44.4	2.8
Czech Republic	2002	36.2	14.8	51.1	2.4
Denmark	2000	32.3	9.5	41.7	3.4
Finland	2003	32.2	12.8	45.0	2.5
France	2002	28.1	9.4	37.5	3.0
Germany	2003	36.3	12.9	49.2	2.8
Greece	2003	35.2	21.9	57.1	1.6
Hungary	2003	34.0	18.8	52.8	1.8
Ireland	2002	34.0	13.0	47.0	2.6
Italy	2002	33.5	8.5	42.0	3.9
Netherlands	2002	35.0	10.0	45.0	3.5
Poland	1996	31.7	11.4	43.1	2.8
Portugal	1999	36.8	12.8	49.6	2.9
Spain	2003	35.3	13.1	48.4	2.7
Sweden	2003	33.1	9.7	42.8	3.4
United Kingdom	2003	39.0	23.0	62.0	1.7
United States	2002	35.1	30.6	65.7	1.1

Source: OECD FACTBOOK 2006 – StatLink://dx.doi.org/10.1787/341527146806

The combination of reported overweight and obesity exceeds the 40 per cent prevalence in most countries. Currently, almost 400 million adults in the Region are estimated to be overweight. In particular, it is interesting to note that Southern countries such as Greece, Portugal and Spain present very large levels of O&O.

According to the WHO Europe (2005) report, Europe has one of the highest average BMI of all WHO regions – nearly 26.5. The numbers of those overweight are rising everywhere. Both the mean of BMI as well as the prevalence of overweight increased in all Western European countries. This means a continuing population shift away from the normal healthy range of body mass index. While there is evidence of a marked trend towards increasing levels of O&O throughout Western Europe, decreasing trends in BMI were observed in Central Eastern European countries. Some countries in the region have reported a fall in obesity rates. In Russia, the prevalence of overweight and obesity declined from 15.6% to 9.0% between 1992 and 1998 (IOTF, 2003).

Particularly concerning is the growing rate of obesity in children. There is increasing evidence of a significant increase of paediatric obesity in European children and adolescents. The data collected by IOTF in collaboration with the European Childhood Obesity Group suggest that childhood obesity has increased steadily in European countries over the past 2-3 decades and various studies suggest that childhood obesity has reached the dimension of an acute health crisis in Europe. Across the EU-25, almost 1 in 4 children are overweight, and the figure is rising by around 400,000 a year. Childhood rates of overweight and obesity in Southern Europe tend to be higher than in Northern Europe. The rates range from 10-20% in Northern Europe, while they range from 20% to as high as 35 per cent in Southern Europe.⁶ Interestingly, a north-south trend has also been reported within

⁶ In particular, in the Mediterranean islands (Malta, Sicily and Crete) as well as in Spain, Portugal and Southern Italy, O&O levels exceed 30 per cent among children aged 7-11. A recent survey found that 36% of 9-year-olds in Italy are overweight or obese. In parts of Southern Italy, the scale of the problem is similar to that of the US. In Greece, the prevalence is 26% in boys and 19% in girls aged 6-17 years. In Spain, 27% of children and adolescents are overweight or obese, while data from Crete show 39% of children aged 12 to be overweight or obese (IOTF, 2005).

countries. A survey in Italy showed children in the south of the country to have a prevalence of overweight of some 23%, and in the central and northern area to have a prevalence of some 13 per cent (Lobstein and Frelut, 2003).

The epidemic is spreading at particularly alarming rates. Recent IOTF estimates indicate that childhood overweight and obesity are increasing rapidly in England and Poland where the rise is greater than the US rate. As a consequence, these two countries are converging to the US levels of childhood obesity. In Spain, Netherlands and France the rise is similar to those in the US. In France, the prevalence of childhood overweight and obesity increased from 3% in 1960 to 16% in 2000. In Poland, it increased from 8% to 18% between 1994 and 2000.

An additional 400,000 children each year are becoming overweight, adding to the 14 million-plus who are already overweight, including at least 3 million obese. What's more, the increase has accelerated in recent years: according to the International Obesity Task Force, the annual increase in prevalence of around 0.2% during the 1970s rose to 0.6% during the 1980s and to 0.8% in the early 1990s, and in some cases reached as high as 2.0% by the 2000s (IOTF-EASO, 2005).

These patterns indicate that in large part of Europe the gap with the US in terms of childhood overweight and obesity tends to narrow. In any case, there is evidence that many European countries tend to follow the US with a 10-15 year lag.

In summary, the main stylized facts regarding O&O in Europe are the following:

- SF1 There are significant differences in obesity rates across Europe.
- SF2 European obesity rates are lower than the US rates. The prevalence in the US is nearly three times the average EU prevalence.
- SF3 Adult obesity is increasing throughout Europe.
- SF4 Overweight rates are large in every country and very close to the US rates.
- SF5 Childhood rates of O&O are escalating and European countries are narrowing the gap with the US.
- SF6 Adult and childhood O&O are very high in European Southern countries.

In other words, Europeans are not obese like Americans but are becoming more obese and, given the trends in child obesity, overweight problems will increase. There is also evidence that O&O already cause high economic costs. The WHO Europe (2005) estimated that the economic burden due to loss of productivity and income created by obesity is about 2–8% of overall health care costs while obesity related illnesses are estimated to account for as much as 7% of total healthcare costs. These estimates will need to be re-evaluated because the costs are rising and will continue to increase as the pressure to manage the co-morbidities of obesity grows (IOTF, 2003). The biggest burden will be felt not merely in health service and economic costs, but in the social price with extended years of disability and premature mortality. In addition, there are indirect financial costs and intangible social costs, such as underachievement in school and discrimination at work.

The disability-adjusted life-year (DALY), an indicator of time lived with a disability and time lost due to premature mortality indicates that the contribution of nutrition to the burden of disease in Europe is impressive. The share of DALYs lost to diseases that have a substantial dietary basis (separately from that to which dietary factors contribute less substantially but still importantly) is very high. In 2000, 136 million years of healthy life were lost; major nutritional risk factors caused the loss of over 56 million and other nutrition-related factors played a role in the loss of a further 52 million (WHO, 2004).

3. The determinants of overweight and obesity: theoretical hypotheses and empirical evidence

What are the causes of the rising O&O in many European countries? Can we explain the differences between the levels and trends in overweight and obesity observed in Europe? What is the

responsibility of government, business, civil society and citizens in addressing obesity? Do we need active public policies? Is there an European approach? Is it effective?

Before turning to the examination of these issues, we provide a brief review of the theoretical and empirical literature on the determinants of O&O. We also examine the debate about the merits and limits of public policies in this area. This is the purpose of the present section.

There is a consensus that the background of obesity is a genetic predisposition. Several studies have provided strong evidence of a genetic influence on body weight and obesity. While some estimates have suggested that up to 80% of the variance in body fatness may be attributed to genetic factors, this does not mean that lifestyle and environmental factors have little impact on body weight. On the contrary, currently, monogenetic obesity is extremely rare and the genetic influence on obesity should be regarded rather as a predisposition to body weight gain. The consensus is that weight gain and obesity develops in susceptible individuals when they are exposed to lifestyle characterized by an increase in net calories intake (Astrup 2001). O&O can be seen as a function of an individual's energy balance over a number of time periods or ages. The energy balance at time t (EB_t) is defined as calories intake at time t (C_t) minus calories expended at time t (E_t):

$$EB_t \equiv C_t - E_t, \quad (1)$$

O&O, measured for example by the BMI is, therefore, a cumulative function of the individual's energy balance over a number of periods:

$$BMI = \varphi (\sum_t EB_t, \varepsilon) \quad (2)$$

where ε is a vector of variables (age, gender, race, state of residence, marital status, income) that is specific to an individual and is related to that person's predisposition towards O&O. Equation (2) highlights that either a rise in calories ingested or a reduction in calories expended can lead to weight gain. Thus, to explain the phenomenon of O&O, it is necessary to examine the determinants of calories consumed and expended.

Calories intake and/or calories expended

While there is consensus that, given genetic predisposition, the rise in O&O is the result of a change in the net calorie balance, and it is also widely accepted that both energy intake and physical activity contribute to overweight gain, it is not clear to what extent increased consumption and decreased energy expenditure contribute to the change. There is no consensus on the relative importance of these factors. The debate sees the presence of two views. The first view is based on the hypothesis that O&O are basically the result of a decline in physical activity. The second view emphasizes the importance of calorie consumption. There is, however, another relevant issue in the debate: Are food-consumption choices rational and socially optimal? May individuals be wrong? Let us examine briefly such issues. Food-consumption and calories intake is clearly a more than plausible hypothesis to explain weight gain. Recently, however, an influencing body of research has put the emphasis on the decline in calories and energy expenditure. This body of research emphasizes the reduction of physical activity associated with a more sedentary lifestyle in home- and market-production as well as in leisure time as the main factor at work (Philipson and Posner, 1999; Lackdawalla and Philipson, 2002). Lackdawalla and Philipson (2002) found that about 40 percent of the growth in weight from 1976 to 1994 in the US is due to lowered food prices, while 60 percent is due to declining physical activity related to changes in home and market production.

Philipson and Posner (1999) argued that long-run technological changes have led to a decline in the relative cost of food while exercise has become relatively more expensive. Lakdawalla and Philipson (2002) confirm that the obesity epidemic is the result of two simple changes in incentives:

the relative price of consuming a calorie has fallen over time while the opportunity cost of burning a calorie has risen.

Some authors have argued that weight gains occurred despite minimal or no increase in per capita energy intake. This explanation has also been described as the “American paradox”, and cited as evidence that the obesity epidemic is mainly caused by decreased physical activity rather than to changes in eating patterns. Explanations of O&O based mainly on the role of calories expenditure run, however, into a major empirical problem. Empirical evidence does not support the existence of an “American paradox”. The increases in the obesity rates in the US cannot be explained without referring to the role of calories intake. What’s more, recent research has put a strong emphasis on the notion that food intake plays a crucial role to explain the increases in BMI.

As Cutler, Glaeser and Shapiro write in a 2003 *Journal of Economic Perspective* article, the growth in caloric consumption in the United States in the last two decades “is three to four times the increase that is needed to explain the increase in average obesity over the time period” (p. 102). They also note that while explanations based on the decline in physical activity may explain long-run patterns, such hypothesis is unable to explain the recent acceleration in obesity given that over this period the energy spent has remained substantially at the same level. According to these findings, they suggest that the calorie consumption hypothesis, not reduced caloric expenditure, is the most plausible hypothesis to explain why American have become more obese in the last two decades.

Several specific factors, on the other hand, can explain an increase in calories consumed: people could simply eat more, the caloric density of the food could rise, or people could change their diet composition to ingest greater calories. Relative prices may matter in the sense that calorie-dense foods could become less expensive relative to other foods. A greater tendency to take food away from home (FAFH) may contribute. The nutritional content of FAFH tends to be less healthy than foods prepared at home since it is difficult for any producer to reduce fat and calories without compromising taste, given the current state of food technology. Fast food and convenience food generally have a high caloric density (calories per pound) to make them palatable. This means that if the reduction in the total amount of food consumed does not fully offset the increase in density, total calories consumed rises with caloric density (Chou, Grossman and Saffer, 2002).

Cutler et al. (2003) hypothesize that the recent rapid increase in obesity in the US is the result of technological advances that have led to a dramatic decrease in the time cost of food. The idea is that recent technological advances in food preparation and distribution have made possible a wide range of prepared and convenience foods that require little or no preparation time at home, reducing the time required to prepare meals. Thus, not only has food become less expensive over time, it has also become much easier to prepare and eat. These authors note that: “[in] the 1960, the bulk of food preparation was done by families that cooked their own food and ate it at home. Since then there has been a revolution in the mass preparation of food [...] the switch from individual to mass preparation lowered the time price of food consumption and led to increased quantity and variety of foods consumed” (Cutler et al. 2003).

In particular, they persuasively show that the main reason for increased dietary caloric intake in the United States are calories consumed outside of the main meals (i.e., snacks). Americans nowadays eat more frequently than they used to, even though average caloric consumption at dinnertime has been somewhat reduced.

Do we need active public policies?

What has to be done in front of the phenomenon of O&O? Is there a role for public policies in addressing O&O? The standard economic paradigm provides a simple explanation for obesity. It explains unhealthy behavior in terms of poor diet and/or exercise as the result of rational choice. It is important to note that from the perspective of the standard neoclassical model, weight gain has nothing to do with market failure. Consumers are perfectly informed about the trade-off between short-run pleasure of eating palatable food and negative long-run consequences to health. To the

extent that O&O are rational response to changing technology and prices there is no reason for government intervention. If people choose to eat more and exercise less, overweight gain is the result of rational, socially optimal choices made by individuals pursuing their own preferences. As Philipson and Posner (1999) observed, from a rational-choice perspective, one has only to distinguish between being overweight in a 'medical sense' and being overweight in a social Pareto-inferior way. According to this view, O&O are a side effect of welfare-enhancing technological change, a sort of unintended consequence of economic development (Lakdawalla, Philipson and Bhattacharya, 2005). Assuming rational consumers who decide how much to consume on the basis of price and income, fully accounting for the future health consequences of their actions, the standard model leads to a framework where there is no role for public policies. Hence, a policy of laissez-faire is quite appropriate.

The problem with this view is that the idea that food-consumption choices are socially optimal is rather extreme. A laissez-faire approach can only be justified in the presence of perfect information, in the absence of externalities and self-control problems. Rational and fully informed consumers cannot be affected by public education campaigns about the negative consequences of weight gains. Information, however, may be a problem. Consumers may choose unhealthy diets simply because they do not have enough information to make informed choice. They may be uninformed about what constitutes a healthy weight and about the negative health consequences of overweight and obesity. If consumers do not have enough information to make informed choices, then their food choices may not actually match consumer preferences. The market outcome may not reflect true consumer preferences. In other words, from the point of view of the economics of information, there is room for a government intervention.

Some argue that it is difficult to believe that nowadays consumers are not conscious of the relationship between a healthful diet and O&O problems. For example, Kuchler and Golan (2004) pointed out that physicians, government education programs, nutrition labels, and product health claims all provide consumers with information on the notion of a healthy diet and weight. They also indicate the existence of empirical evidence suggesting that a majority of American consumers have basic nutrition knowledge.

However, the fact that many consumers have basic nutrition knowledge does not reduce the usefulness of such policies. On the one hand, this knowledge is also the result of public policies themselves and, on the other hand, even if, in general, we do not observe a lack of information there is nevertheless evidence of some information blackout zones in key areas such as food at restaurants and fast-food chain.⁷ This means that the lack of information may continue to be a problem and public policies have a role to play here.

Second, unhealthy behaviors may depend on the fact that consumers do not bear all the health costs of their choices. If overweight and obese people consume more medical care, and if much of that medical care is paid for by society rather than the individual, then there is a negative externality associated with O&O. And social costs of O&O higher than private costs imply government intervention.

⁷ Information may be a problem particularly for food sold at restaurants and fast-food establishments. While market mechanisms can disclose information on even negative product characteristics (for example, restaurants advertising healthy menu options may cast into doubt the health quality in competing restaurants that does not advertise such claims allowing consumers to make appropriate inferences about foods without claims), this competitive mechanism weakens whenever negative attributes are widely shared by producers. In this case, no producer has an incentive to disclose information about fat and calories because no competitive advantage can be gained by doing so; as a result, there may be little advertised nutritional information against which to contrast and compare any particular food option (Kuchler and Golan, 2004).

There is no surprise, therefore, that the debate is lively about the empirical relevance of this externality. Philipson and Posner (1999), for example, doubt that obesity generates negative externalities large enough to justify government intervention. On the contrary, Krugman (2005) indicates in externalities a key reason why active public policies are needed.

Given that direct and indirect costs to society of O&O-related diseases can indeed be substantial, it is difficult to deny a significant presence of external effects. The existence of private and public health insurance, distorting the correspondence between the personal and social costs of an unhealthy weight, may reduce consumers' incentives to choose a healthy diet.

Recent works have emphasized the existence (and examined the consequences) of self-control problems in food choices. The issue is that, typically in food decisions, intertemporal choices are involved, namely decisions involving trade-off among costs and benefits observable at different times. Consumers face a trade-off between short-run pleasure associated to eating palatable foods and long-run health consequences. What happens if people lack the self-control to reduce current consumption in favor of future health?

There is evidence that agents have a self-control problem in food choices. While many consumers reveal awareness of the health consequences of food overconsumption, nonetheless they tend to overeat. They overeat, despite substantial evidence that they want to lose weight (Cutler et al. 2003; Smith, 2006). If people have difficulty in controlling calories intake, reductions in the time cost of food preparation may exacerbate self-control problems. People with self-control problems may find themselves overconsuming food, particularly when the time costs of food preparation fall. If we acknowledge the presence of limits on willpower, consumers may be making unhealthy food choices but their food choices are not fully rational and socially optimal.

The problem with the standard economic model is that it assumes unbounded willpower. Having solved for the optimum food-consumption, the neoclassical consumer is next assumed to choose exactly that optimum. Real behavior, however, may be different. Behavioral economics, combining psychology and economics, provides key insights about what happens if agents deviate from the assumptions of the standard economic model. While the standard neoclassical theory of rational behavior assumes that decision makers, given their knowledge of utilities, alternatives, and outcomes, can compute which alternative will yield the greatest subjective (expected) utility, the notion of bounded willpower captures the fact that people sometimes make choices that are not in their long-run interest.

Decisions about diet and health have costs and benefits which occur at different points in time. The standard assumption is that people weight future utilities by an exponentially-declining discount factor. Hyperbolic time discounting for intertemporal choice implies that people will make relatively short-sighted decisions when some costs and benefits are immediate. The decisions produced by hyperbolic time discounting create a time-inconsistency in intertemporal choice not present in the exponential model. There is considerable evidence that people may display time inconsistent behavior, weighing current and near-term consumption especially heavily and pursuing immediate gratification rather than long-run well-being.

Such present-biased preferences can be captured with models that employ hyperbolic discounting. The behavioral explanation supports the possibility that over-consumption may be a wrong behavior. In the presence of self-control, there might be internalities, namely costs borne by individuals themselves because of their higher weights. The policy implication is that unhealthy behaviors should be corrected by policies. Obviously, information policies may not suffice to change behaviors given that hyperbolic consumers, even when they know what is best, may fail to choose it for self-control reasons. But other policies, as we will see, might be useful. In any case, behavioral economics and the self-control hypothesis emphasize the notion that food choices are not always socially optimal.

It is interesting to note that Cutler et al. (2003), while recognizing the existence of self-control problems in food choices and the fact that a consumer with self-control problems may over-consume food, they give the impression of minimizing the need of correcting policies. They argue

that only extremely hyperbolic consumers may be hurt by the change in technology, while people without extreme self-control problems will be better off. They also note that, while “there is no evidence on the incidence of extreme hyperbolic discounting in the population, we suspect that most people are better off from the technological advances of mass food preparation, even if their weight has increased”(p. 116).

While it is easy to agree with the idea that the welfare implications of the reduction in time costs of food preparation are positive, it should be noted that, in any case, this is a net effect. The positive impact of technological change does not mean that it does not produce negative consequences. Indeed, current levels and trends in O&O rates suggest that these costs may be large. The relevance of obesity prevalence suggests that something should be done to reduce these negative consequences of the epidemic. Cutler et al. (2003), however, are silent about the role of public policies. Despite the emphasis on the role of self-control, their policy implications are not different from the ones of Lackdavalla, Philipson e Bhattacharya (2005) who emphasizing the welfare-improving character of technological change suggest a policy of *laissez-faire*.⁸

In addition, the idea of a clear-cut divide between extreme hyperbolic and non-hyperbolic consumers does not seem plausible in a world where overweight (and not only obesity) is so spreading. These patterns may indeed be taken as evidence that the average consumer fails to choose a healthy diet. Thus, time and price reductions in food preparation lead to welfare increases but this does not mean that active public policies cannot improve the situation. Current levels in calorie overconsumption as well as the increase in O&O suggest that something is going wrong and that more effective policies should be adopted.

A further argument supporting an active public policy is provided by the notion that food preferences may be endogenous and inconsistent with a health diet. This is another hypothesis that is hard to reconcile with a standard neoclassical analysis but can be supported by behavioral economics. Standard preference theory assumes that preferences are ‘reference independent’. But recent research in behavioral economics shows that preferences are not the pre-defined sets of indifference curves of standard theory. They are often ill-defined, highly malleable and dependent on the context. For example, because of the existence of ‘framing effects’, the way that choices are presented to an individual often determine the preferences that are “revealed”.

Some authors have advanced the hypothesis that an important cause of O&O may be due to the consequences of food marketing and advertising. Television advertising, in particular, may not convey information or convey distorting information contributing to unhealthy behavior. Strong preferences for high-calorie foods, particularly in children who are more subject to manipulation, may be created by television commercials (Nestle, 2002). Not surprisingly, some authors have called for restrictions on food advertising to fight child obesity.⁹

Finally, it is crucial to consider that social inequalities may be a factor that does matter. There is evidence that low-income households face specific difficulties in achieving a healthy diet. Information policy and measures such as nutrition education programs and food labeling are weak solutions because these policy tools may fail to take into account the full impact of structural

⁸ Interestingly, Cutler et al. (2003) minimize the role of external costs of calories intake because they suspect that such costs are relatively small compared to the internal costs.

⁹ Of course, the issue is complex and the evidence is mixed. For example, Zywicki et al. (2004) found that the rise in obesity in recent years is not associated to a rise in children’s exposure to food advertising. They also pointed out that advertising and marketing – and government policies towards them - can be part of the obesity problem’s solution. Educating consumers about nutrition and pushing firms to respond to consumer demand for healthier foods, advertising can provide information to consumers, improve their awareness about food nutrient content and lead to healthier eating habits.

influences on food choices. To be effective, interventions should address structural factors to help poorer families make informed choices. The emphasis on individual behavior may underplay material limitations on 'healthy eating' for people with low-income (Attree, 2006).

In sum, in a world with less than perfect information, externalities, self-control problems, endogenous preferences and social inequalities the equivalence between individual choice and individual and social welfare is weakened. This leads to policy implications very different from those suggested by the rational-choice perspective according to which, if consumers are freely choosing to eat more (or exercise less) because of technological changes that make calories more affordable (or exercise less affordable), government intervention is not necessary.

A multi-factor approach

Neither the food intake hypothesis nor the food expenditure, taken in isolation are fully convincing. The food intake explanation developed by Cutler et al. (2003) provides a plausible explanation of increasing obesity rates. But this does not mean that public policies have to focus only on food and nutrition policies.¹⁰ O&O problems are of complex, multifactorial origin. They are caused not only by genetic determinants but also by a complex interaction between lifestyles and several environmental factors.

Consumer choices can be influenced through several measures such as taxes and subsidies, recommendations of health authorities and food labelling requirements. Information policy, such as nutrition education programs and labelling, will remain important but a new, more effective approach to increase the effectiveness of programs designed to influence diet, exercise, and other weight-reducing lifestyle choices.

A more prescriptive approach to managing diets is based on taxes and subsidies. The proposal of taxing unhealthy foods such as snack foods to raise prices and discourage consumption of 'junk food' has received much attention. Subsidies could lower fruit and vegetable prices, creating an incentive for consumers to substitute fruit and vegetables for snack foods. In addition to programs that affect food intake, there are the programs that affect calorie expenditure, from urban planning to the promotion of physical activities

While effective public policies are necessary, it is apparent that they are a difficult task. Obviously, a very careful approach is essential, more careful than in other areas of government intervention. Some restrictions on advertising or on food product characteristics may make sense. After all, advertising for products such as tobacco and alcohol (which share many features with candy and soft drinks) is already severely limited in most countries. But the issue is delicate. It is difficult to say at what point such policies become too restrictive (Smith 2004).

The policy tools available to policymakers to create incentives for individuals to alter diet and lifestyle choices affect only some of the determinants of food choices. As pointed out by Kuchler and Golan (2004), causes that have nothing to do with market failure and that underlie the growth in

¹⁰ Cutler et al. (2003), in this regard, are rather crude. To disregard the hypothesis that occupation changes are not a major cause of the increase in obesity in the last two decades, their argument is that children do not work now and they did not work in 1980 while obesity increased among children as well. But energy spent in leisure time could contribute to explain the increase in childhood weight gains. Lackdavalla and Philipson (2002) pointed out that leisure issues may be particularly important for explaining the growth in child obesity. Technological change, such as computers and television may have raised the utility of consuming leisure but lowered the calories spent in doing so. Further mechanisms may have contributed such as reductions in walking and cycling to school and the fact that children are taught competitive sports and deterred from informal exercise. Prentice and Jebb (1995) found that two indicators of inactivity (hours per week of television viewing and numbers of cars per household) are closely related to the current British increase in obesity.

O&O may remain. This is the case of technological change effects on relative prices and easier access to food.

Public policy targeting specific foods or lifestyle choices could have unintended consequences (Kuchler et al., 2005a, 2005b). Lakdawalla, Philipson and Bhattacharya (2005) suggest caution in using Pigouvian taxes targeted at specific foods as a remedy for the negative external effects of obesity. Their empirical findings indicate that raising food prices through taxation may reduce weight but can also have negative effects on nutrition and health given that lower food prices tend to improve nutritional status even in a developed country like the United States.

There are limits to what can be done from the food intake control side both in terms of individual choice and of more stringent public policies oriented to influence such private choices. At the end of the day, diet is a highly personal choice and the enforcement of dietary norms is generally difficult.

As a consequence, the solution to O&O may not be found in the food area or not only and mainly in this area. While food choices do matter in explaining the problem, given the specific difficulties in diet management, it seems particularly useful to look at the opportunities of approaching the issue from the physical activity side. To change the job energy expenditure is impossible, but it is possible to affect energy spent in commuting to work and in leisure time. In this direction it may be easier to incentive healthy behaviours without negative intrusions on very private and personal choices.¹¹

Our hypothesis is that a more viable and effective approach could be based on the side of energy consumption and exercise. Indeed, just because several factors influence lifestyle choices affecting diet and exercise, public policies to reduce overweight and obesity can adopt several forms and policy tools. Policy targeted at any of the numerous factors at work can be useful to reducing obesity and overweight.¹² This provides freedom of choice for policymakers in the sense that policy tools, programs and measures can be selected optimally in relation to their cost-effectiveness.¹³

A multi-factor approach allows, in addition, important synergies with other policies. Indeed, several policies targeted to different purposes may also have significant positive impacts on the determinants of weight gains. Reducing social exclusion and crime and better urban planning can improve the physical environment making it easier for people to walk and exercise. Energy-saving transport policies may improve the availability of physical activity-related facilities. More-educated

¹¹ Obviously, an excessive coercitive intrusion on individuals' choices is possible even in physical activities. In Italy, there still is memory of 'sabato fascista', a coercitive programme forcing people to exercise collectively on Saturday, even if that goal had much more to do with making the Italians ready for the war than with weight control as an end.

¹² In this sense, I disagree from Philipson et al. (2004) who claim that "resolving the energy intake-expenditure split is important in deciding whether policy interventions should focus on food intakes or physical activity". Of course, more knowledge about the relative role of calories intake and consumption is useful but it is important to see that in a multi-factor approach there are more degrees of freedom in selecting tools and instruments to design public policies.

¹³ It is worth noting here the existence of political-economy issues. The International Obesity Taskforce pointed out that the food industry seeks to focus on inactivity and promote sports to divert attention from the role of foods and drinks (IOTF, 2003). Interestingly and not surprisingly, this approach is adopted in the communication of the snack industry. According to the European Snacks Association "over the past 25 years fat intake in Europe has fallen, resulting in marked reductions in energy intakes for most people. Clearly, the increases in O&O indicate that factors other than dietary fat are implicated in this relationship. The decline in physical activity levels has undoubtedly played a part in the increased prevalence of obesity"(European Snack Association, 2006).

individuals may place a higher value on future health than present consumption and find choosing activities that carry lower health risks optimal. Education may also increase a person's ability to reassess prior choices in light of new dietary information.¹⁴

Clearly, education, social cohesion, the quality of urban environment, energy-saving transport policies are important per se but they can also have a positive impact on physical activity and energy expenditure. There is a strong economic argument here related to the notion of scope economies in funding public policies.

Thus, an integrated, comprehensive, multi-factor and multi-stakeholder approach involving a complementary range of actions, programs and measures to promote and support both healthy diets and regular physical active levels may result the best effective and cost-effective approach to tackle obesity problem.

4. How to explain European patterns?

In the previous section, we examined the main theories about the determinants of weight gain. Our purpose in what follows is to shed some light on the determinants of the stylized facts identified in Section 2. Our aim is not to provide a formal and detailed empirical analysis. The purpose is much more limited. We focus on the key patterns and will make an attempt to identify some explanation on the basis of the hypotheses examined in Section 3.

Some explanations are simple. Clearly, this is the case of the decline in obesity rates in Eastern countries in the 1990s. These patterns mainly reflect the difficulties of the economic and political transition in these countries. But the main patterns identified in the above section 2 are more complex to explain. For example, why are rates of overweight and obesity so different in Europe (SF1)? This heterogeneity should not be a surprise given the widely varying food habits and dietary patterns across Europe as well as the variety of geographical, climatic, environmental and social conditions, including income levels. But, indeed, cross-country differences in Europe, particularly in obesity rates, are so large that a formal empirical analysis would be particularly interesting.

SF6 indicates that the Southern European countries have the highest levels and increases of O&O both among adults and children. This fact is particularly impressive. A study conducted in Greece by Drichoutis et al. (2005) argued that the reason why Greece results first in adult obesity is mainly due to the replacement of the 'mediterranean diet' with ready-made and fast foods. A similar conclusion is provided by Robertson et al. (2004) who show that a specific pattern of nutrition transition can be detected in Southern European countries. While the diet of these countries was traditionally the 'Mediterranean diet', Greece, Portugal and Spain are moving from Mediterranean-type diets to food diets more like those eaten in northern Europe, typically rich in meat and dairy products.

Our hypothesis is that the conventional nutrition transition associated to economic development may become particularly dangerous for healthy diets in countries which are also catching up through technological changes and marketing strategies leading to processed, high-density foods. This environment may contribute to create a specific shock for diets. In other words, while the developed countries faced the nutrition transition more gradually, in the context of a relatively more stable technological and marketing environment, in less developed countries the interaction between

¹⁴ Loureiro et al. (2005) found that education is a significant mitigating factor of obesity. Expenditures on education have a negative effect on obesity in their cross-country analysis of OECD data. They also find that education seems to have a higher impact on reducing exclusively obesity problems than on reducing the incidence of general overweight problems. Does this mean that education affects hyperbolic behavior?

the nutrition transition and the catching up process towards cheap, energy-dense foods determine a much more quick and radical change. It is plausible to hypothesize that both consumers and public institutions in these countries may result less ready in tackling the problem of unhealthy diets.¹⁵ More research would be useful on this issue.

But let us examine the main topic issue in this paper. As we have seen, Europeans are not as obese as Americans but they too are becoming more obese and at least some European countries seem to be converging to American levels, particularly in childhood O&O (SF2, SF3, SF4, SF5). How can we explain these patterns?

Why Europeans are becoming more obese?

Firstly, there is evidence that Europeans fail to choose a healthy diet. The average European diet is not consistent with the consensus diet. Nutritional trends in the EU show that the consumption of fruit and vegetables is lower than recommended intake, especially in the new member states and in most socio-economically disadvantaged groups. The dietary intake of fat, and especially the intake of saturated fats, is high in almost all Member States. Lobstein (2004) pointed out that in the EU the proportions of populations meeting the recommended healthy eating targets are extraordinarily low. Srinivasan et al. (2006) indicate that no European country conforms to all the four WHO dietary norms while several countries violate any of these recommendations. In other words, current food consumption patterns are incompatible with the WHO norms and the adjustments in consumption necessary to adhere to these norms seem substantial. Be it a problem of information and/or self-control, the diet problem is very serious. If European consumers were well informed and /or concerned only with health outcomes, their diet would be quite different.

Technological change in food preparation

Can the calorie consumption hypothesis developed by Cutler et al. (2003) explain why Europeans are becoming more obese? As already noted, the hypothesis developed by Cutler and colleagues is that the recent rise in obesity in the US is the result of an increase in food intake due to technological changes in food preparation making it easier the access to food.

This hypothesis could explain both the increasing levels of O&O in Europe as well as the lower European rates in comparison to the US. A clear prediction of the hypothesis is that obesity rates should be lower in countries with lower access to technological change in food preparation. This is the case of Europe. Recently, Freeman and Schettkat (2005) noted the existence of a more extensive shift of traditional household production – food preparation, childcare, elderly care, cleaning houses – to the market in the US than in Europe. They started from this fact (defined as the marketization hypothesis) to explain why employment rates and hours worked per employee are in the EU lower than in the US. Since women traditionally do most household production work, the marketization

¹⁵ The mechanisms at work might be those indicated by Caballero (2005) to explain why being poor in a middle-income country is actually associated with a higher risk of obesity than being richer in the same country. The reason is that in a middle-income country, the availability of mass-produced, low-cost, energy-dense foods has a strong effect on the food choices and dietary patterns of low-income families given the large proportion of family income allocated to food expenditure. This may facilitate the consumption of more calories just while widespread access to television tends to favor an indoor, sedentary lifestyle leading to obesity. Instead, the wealthier segments of population may address problems of excess weight by access to better education about health and nutrition, sufficient income to purchase more expensive healthier foods, greater quantities of leisure time for physical activity.

argument can explain the differences in the market work of women, which in fact constitutes much of the EU–US employment and hours gap.

We argue that this same hypothesis could also explain the differences observed in O&O. Table 3 shows the time spent cooking at home, a good proxy of the relative spread of technological change in food preparation. Interestingly, the data indicate that the time spent is lower in the US (4.1 hours per week), immediately followed by the UK (5.6 hours) while continental Europe reveals a significantly higher figure (7.0 hours).

While these differences in the time costs of food preparation can contribute to explain the differences in obesity rates between Europe and United States, it is important to note that in Europe both technological change in food preparation and food consumption patterns are developing along patterns quite similar to the US ones. Venturini (2002) noted that the evolution of consumption patterns in Europe is quite similar to the US patterns as described by Senauer (2000) and Kinsey (2001) and that these patterns are consistent with the hypothesis developed by Connor (1994)

TABLE 3. TIME SPENT COOKING AT HOME (hours per week)

United States	4.1	Germany	6.5
United Kingdom	5.6	Italy	10.0
Netherlands	6.3	Austria	7.1
Norway	6.0	France	--
Sweden	7.7	Unweighted Europe	7.0

Source: Freeman and Schettkat (2005).

according to which the trends observed in Europe parallel those in North America with some tendency for Northern America trends to begin earlier.

It is well-known that European consumers are increasingly turning to more value added convenience and processed food. Food consumption, in quantity terms, increases slightly whereas total expenditure tend to rise fueled by sales of prepared and convenience foods. Sales of ready-meals are growing. The factors behind such changes are well known and can be indicated in higher incomes, changing demographic and social characteristics as well as changing lifestyles. New technology, such as microwave ovens enable these changes. A particularly relevant role is played by the growing value of time. The amount of time spent in preparing meals at home has been reduced. Not surprisingly, this has resulted in a higher demand for quick, easy-to-prepare meals. Hence, the increasing use of convenience food, highly prepared foods, ready-to-eat meals as well as an increase in the proportion of food consumed as FAFH (Venturini, 2002).¹⁶

More to the point, there is evidence of a decline in formal meal occasions and an increase in snacking in Europe. The moves towards an increasingly informal and time-pressured society have undoubtedly had an impact on sales of snack foods and soft drinks, even if there are differences in the timing of these changes.¹⁷

¹⁶ There is also evidence that European consumers are increasingly concerned on health problems associated with dietary habits. New food categories such as 'weight control foods' are springing up (Venturini, 2002). On the other hand, O&O rates are increasing. These two facts suggest the existence of self-control problems.

¹⁷ For example, there is evidence that these trends have been slower to develop in Italy, particularly outside the industrialised North, than in some more northernly countries This is due to the fact that Northern Italy is much closer in spirit to Western Europe than is the rest of Italy, which remains predominantly rural, deeply traditional in outlook and slower to accommodate change (MINTeL, 2006).

In sum, Europe is in some way a follower of the US along the changes that Cutler et al. (2003) identify as the main culprit of overweight. On the basis of the food consumption hypothesis, this may explain the lower levels of obesity. On the other hand, to the extent that Europe is following the US along the same food consumption patterns, it is possible to predict a scenario of increasing O&O rates in Europe in the next future.

Changes in Total Calories Intake

A more direct test of the food consumption hypothesis requires an analysis of calorie consumed. Is there evidence of an increase in food intake in Europe? A clear prediction of the Cutler's hypothesis is that calorie intake should increase because technological change incentives consumption through lower relative prices and easier access to food.

To get an idea of the impact of calories consumed, Table 4 shows levels and changes over time of total calories intake in European countries as well as in the US. It is possible to see that the total caloric consumption has grown in all countries. In the US available per capita calories increased from 2,871 calories per day in 1961 to 3,760 calories per day in 2003. There are countries, mainly Mediterranean countries, in which the increase in calories intake is very large and quite similar to the US increase. This is the case of Greece, Italy, Portugal, Spain. By contrast, calories consumption does not reveal substantial increases in Denmark, Finland, France, Ireland, Poland, Sweden and United Kingdom, while Austria, Belgium, Netherlands and Germany are at an intermediate position.

It is also important to note that while in the US the increase in calories intake is higher in the last two decades – as noted, this fact plays a role in Cutler et al. (2003) -, this increase in calories intake is not a general pattern in Europe. Indeed, the European sample results divided into two groups of countries. Austria, Denmark, Finland, France, Netherlands, Portugal, Sweden and the United Kingdom reveal an increase in calories intake which

TABLE 4. CHANGES IN TOTAL CALORIES INTAKE 1961-2003 (Calories per capita per day)

COUNTRY	1961-1962	1981-1982	% INCREASE '81-'82/'61-'62	2002-2003	% INCREASE '02-'03/'81-'82
Austria	3192	3371	5.6	3721	10.4
Belgium	2938	3354	14.2	3646	8.7
Czech Republic		2932		3296	12.4
Denmark	3145	3164	0.6	3480	10.0
Finland	3208	3070	-4.3	3147	2.5
France	3228	3420	5.9	3641	6.5
Germany	2916	3349	14.8	3502	4.6
Greece	2799	3384	20.9	3668	8.4
Hungary	3083	3485	13.0	3519	1.0
Ireland	3358	3587	6.8	3690	2.9
Italy	2946	3446	17.0	3670	6.5
Netherlands	3058	3039	-0.6	3488	14.8
Poland	3281	3345	1.9	3368	0.7
Portugal	2518	2804	11.3	3758	34.0
Spain	2679	3042	13.5	3425	12.6
Sweden	2823	2970	5.2	3176	6.9
United Kingdom	3279	3149	-4.0	3450	9.5
United States	2871	3179	10.7	3760	18.3

Source: OECD Health Division (2006)

is concentrated in the last two decades. With the exception of Portugal, these countries are those more involved with greater access to technological changes in food preparation. By contrast, there is another group of countries (Belgium, Germany, Greece, Hungary, Ireland, Italy, Poland and Spain) where the increase in calories intake in the first two decades (1961-1981) is greater than in the last two (1981-2003). This pattern is not particularly consistent with Cutler et al.' hypothesis given that it is plausible to argue that technological changes facilitating food access tend to increase over time.

However, it should be noted that, with the exception of Germany and Belgium, the countries with a lower increase of calories intake in recent years are all Mediterranean countries or transition economies. While for the two transition economies (Hungary and Poland), these patterns may be explained by the difficulties with their transition to market economy, in the case of Mediterranean countries these patterns seem consistent with the hypothesis that the nutrition transition in a context of technological change facilitating access to processed and high-density foods may determine a particularly strong shock for diets in the short-run. Indeed, the data seem consistent with the hypothesis that these countries initially overreacted by increasing a lot food intake while a sort of adjustment to more moderate consumption took place in the following period.

Is there an 'American paradox' in Europe?

A striking fact is that in the UK, despite the increase in food intake in the last two decades, the total increase over the entire period considered is rather small and not particularly different from the European average. On the other hand, as we have seen in Section 2, the UK is the only European country characterized by levels and a trend of obesity very close to the US ones. For the UK, the existence of an 'American paradox' seems justified. Finland is another country which show a strong increase in obesity rates (the prevalence increases from 7,4 in 1980 to 12,8 in 2003) in the absence of a significant growth of calories intake.

Are these patterns due to a reduction in physical activity? While an 'American paradox' may be appropriate in these two countries, with the implication that the main factor at work in explaining weight gain might be the decline in physical activity, for most European countries the empirical evidence seems to support the consumption food hypothesis, although its significance appears weaker than in the US.

5. European policies

So far, the role of the public sector in most European countries to managing O&O problems has essentially been one of providing information. For decades, the typical approach has taken the form of measures to encourage citizens to adopt healthy eating habits through public nutrition information, food based guidelines and recommendations for a balanced diet. In order to help consumers to make informed food choices, most countries have voluntary or mandatory regulations about nutrition labelling. Several EU countries offer more or less intense dietary advice to consumers, even if their impact is not always monitored and evaluated rigorously.

The problem with such policies and current approaches is that they do not seem enough to reduce or stop increasing rates of overweight and obesity. This suggests a stronger attention to prevention strategies. But, as a matter of fact, Europe is rather late. Health systems are still more focused on curing illnesses than preventing them. As noted by IOTF (2003), obesity remains underestimated as a disease and there has been little impact on the implementation of programmes on prevention and management of obesity. In few countries policymakers have considered how to address the O&O

problems through more effective measures. Indeed, health promotion, education and information campaigns are likely to be of minimal impact unless there are significant changes in adopting a multi-factor and multi-stakeholder approach to opposing the many factors at work in driving the current European obesity epidemic.

The need of greater efforts is strongly suggested by the World Health Organization. In a recent report, the WHO Europe has emphasized that the challenge of obesity in the European region requires a better balance between individual and population-wide approaches as well as between education-based and multisectoral and environmental intervention. To blame individuals alone for their obesity and overweight is not enough and may be misleading to the extent that the causes of the phenomenon are also, if not mainly, due to environmental factors (WHO Europe, 2005).

At the European level, the WHO Regional Committee for Europe endorsed in 2000 the First Action Plan for Food and Nutrition Policy, covering the period 2000–2005. The Action Plan recommended to combine nutrition, food safety and food security, as well as sustainable development into an overarching, intersectoral policy (Robertson et al., 2004).

There is, however, an increase in policy response at the national level and in some cases, national policies are attempting a broader approach with a stronger focus on physical activity, an increasing awareness of the need of intersectoral measures and greater attention paid to social inequalities. For example, France launched a national healthy nutrition programme in 2001, covering a wide range of measures at the intersectoral level. The Netherlands adopted a national health care prevention policy in 2004, identifying obesity as one of the three priorities along with smoking and diabetes. In the UK, recent years have seen the introduction of numerous government initiatives aimed at improving diet, particularly among poorer groups in society (Attree, 2006). Government strategies to improve nutrition include promoting ‘healthier choices’ of food, such as fruit and vegetables and foods low in saturated fat, sugar and salt, in line with WHO guidelines. A key goal of UK White Paper “Choosing health: making healthier choices easier”, released in November 2004, is to narrow the health gap between social classes making healthier choices easier. Spain adopted a national strategy for nutrition, physical activity and prevention of obesity in early 2005, paving the way for coordinated intersectoral action. In March 2005, the Slovenian Parliament approved a National Nutrition Policy Programme for 2005–2010, one of the first examples of high-level political support for nutrition policy in central and eastern Europe. Sweden has put forward for adoption an action plan for healthy dietary habits and increased physical activity in order to contribute to the overall public health aim of creating societal conditions that ensure good health, on equal terms, for the entire population.

There is also a growing awareness that O&O problems should be addressed at EU level as well through the definition of a pan-European strategy. Indeed, several reasons justify a ‘federal’ action. Governments in European countries are at various stages in experimenting with a range of policies and programmes to promote better nutrition and physical activity. Working together, Member States can pool resources, share information and experience best practices. An EU policy could develop working relations with pan-European stakeholders who can also contribute to a more effective fight against obesity (Garde, 2006). The European Commission could play an important role by analyzing and evaluating current policies in relevant areas, by collecting comparable Europe-wide data on lifestyles and lifestyle-related diseases and advising on best practice, by coordinating Member States’ and stakeholders’ efforts. A coordinated European approach will also ensure that the single market is not undermined by the emergence of a patchwork of uncoordinated national measures. For example, a coordinated approach is necessary in food labelling legislation given that each country in the EU currently still has its own regulations.¹⁸

¹⁸ Recently, the EU Health and Consumer Protection Commissioner Markos Kyprianou said: “The rise in obesity is a Europe-wide problem which requires a coordinated Europe-wide approach if we are to contain and reverse this trend. The Commissioner also noted that: “Europe’s obesity crisis is every bit as severe as that of North America, with devastating public health and economic costs. A

However, it is worth noting that despite the need of (a more involvement European institutions have been slow in.....).¹⁹ Indeed, the European Commission is accelerating its involvement in the area of social regulation related to O&O prevention. In 2005, the Commission adopted a Green Paper on the promotion of healthy diets and physical activity to begin an extensive public consultation on a broad range of issues related to O&O. The purpose of the Green Paper is to gather ideas, suggestions, and information as well as to stimulate discussion to design and implement effective European policies to promote both healthy diets and physical activity and replicate best practice across Europe. The Green Paper acknowledges that the obesity epidemic in the EU has many causes so that a diversified approach to tackling the problem is required. Among the issues looked at in the paper are how the promotion of healthier lifestyles can be effectively integrated into other EU policy areas, the contribution that the Commission's new Health and Consumer programme could make, and the role which self-regulation in the food and advertising industry can play.

It is interesting to see the questions focused by the Green paper. They provide useful indications of the issues about which the Green Paper want stimulate the reflection and seek solutions. They are the following:

“Which kind of Community or national measures could contribute towards improving the availability, accessibility and affordability of fruits and vegetables?

What contribution can Community policies make towards enabling and encouraging consumers to shift towards diets lower in fat, sugar and salt?

Are voluntary codes (“self-regulation”) an adequate tool for limiting the advertising and marketing of energy-dense and micronutrient poor foods? What would be the alternatives to be considered if self-regulation fails?

How can consumers best be enable to make informed choices and take effective action? Which should be the key messages to give to consumers, how and by whom should they be delivered?

What is good practice for improving the nutritional value of school meals and for fostering healthy dietary choices at schools, especially as regards the excessive intake of energy-dense snacks and sugar-sweetened soft drinks?

In which ways can public policies contribute to ensure that physical activity be “built into” daily routines?

How can dietary guidelines be communicated to consumers and in which ways could nutrient profile scoring systems contribute to such developments?” (Green Paper on Nutrition, 2005).

In parallel to the Green Paper on Nutrition, the EU has launched the EU Platform for Action on Diet, Physical Activity and Health. The purpose of the Platform is not primarily to deepen the understanding of the problem but to create the conditions for concrete actions designed to contain or reverse current O&O trends. Significantly, the Platform is based on a comprehensive vision and aims to develop a broad approach. It will not pre-empt, but rather stimulate, other initiatives at national, regional or local level, integrating the responses to the obesity challenge into a wide range of EU policies. A crucial task is the development of concrete actions, aimed at encouraging EU citizens to lead healthier lifestyles with better diets and more physical activity. Five areas in which action should be taken in order to meet the Platform objectives have now been laid down:

comprehensive strategy is needed to stem the rise in obesity in Europe, combining legislative and non-legislative initiatives”(Kyprianou, 2005).

¹⁹ For a recent analysis documenting the fact that attention paid to O&O at European level has been rather low relatively marginal and less attention and funding support in comparison to other issues such as food safety, see Lang and Rayner (2005).

Consumer information and labelling; Education; Physical activity promotion; Marketing and advertising; Composition of foods (e.g. healthy options, portion sizes).

By working under the leadership of the European Commission, it intends to establish more formal and wide approaches bringing together all relevant players. One key purpose of the Platform is to enable all individual obesity-related initiatives to be more promptly shared amongst potential partners and emulators across the European Union as a whole. To this purpose, it develops a coordinated but autonomous action by different stakeholders to deal with the many aspects of the problem. The Platform brings together 34 key players from the food industry and civil society to boost voluntary initiatives across the EU, including information campaigns to promote healthy lifestyles, reducing amounts of sugar and salt in food, improving nutritional information on packages and pledging not to market directly to children. The Commission is also reflecting on how best to revise the current legislation on nutrition labelling. Clear and reliable food labelling is an essential part of helping EU consumers to choose healthier and more balanced diets.

Better nutrition and more physical activity to reduce obesity are also key priorities in EU public health policy, and have been given much focus under the Public Health Action Programme (2003-2008). But, in order for the campaign against obesity to be truly effective, it is crucial to go beyond the public health sector and to adopt an integrated approach with other policy areas. To this end, discussions have already been held within the European Platform for Action on Diet, Physical Activity and Health with Directorate General (DG) Education and Culture, DG Research, and DG Agriculture.²⁰

In other words, the EU recognizes the significance of the threat posed by O&O and is setting the stage for a new, more effective approach. At least in principle, the EU supports the need of a shift from traditional information-based policies to a broader, integrated approach. This approach combines the promotion of healthy lifestyles with actions aimed at addressing social and economic inequalities and with a commitment to pursue health objectives through other Community policies. This is in line with the notion of a multi-factor and multi-stakeholder approach. It remains to be seen whether the EU will succeed in adopting concrete and effective actions to implement this complex strategy. Two major challenges have to be faced. First, to establish a coherent and comprehensive strategy, it is essential to coordinate policies at local, regional and national levels as well as to enter into binding and verifiable commitments with a large number of stakeholders. The second challenge is to integrate efforts aimed at promoting healthier lifestyles into other Community policies as for example social policy, consumer protection, agriculture, research, transport. An integrated, multi-factor strategy, by definition, would cut across a number of Community policies and requires the creation of the necessary supporting environment at the Community level.²¹

²⁰ Through the Public Health Action Programme (2003-08), the Commission has financed a number of projects related to obesity, its effects and how to address them. Among these is a major project, coordinated by the European Heart Network, aimed at fighting childhood obesity. The “Eurodiet” report which examines the science and policy implications of nutrition and diet in the EU is also a Community-funded project.

²¹ A crucial related issue regards the health consequences of the Common Agriculture Policy (CAP). Opinions differ about the health implications of the CAP. In particular, some suggest that subsidies under the CAP should be directed towards promoting the consumption of fruit and vegetables in most EU countries. But, at the moment, there is no evidence of changes consistent with this indication. More research and information about the health consequences of CAP’s political equilibria is needed.

Concluding remarks

There is an epidemic of overweight and obesity in Europe. As we have seen in Section 2, although there are significant differences in obesity rates across Europe, a trend of increasing obesity and overweight is a robust European pattern. Adult obesity is increasing throughout Europe, although the rates are still lower than in the United States. Childhood rates are escalating and narrowing the gap with the United States.

In this paper, we have been trying to understand the determinants of the problem and the best approach to tackle it. Three main conclusions can be drawn from our analysis. The first one regards the dismissal of a 'laissez faire' policy. According to the standard economic paradigm, weight gain has nothing to do with market failure. Unhealthy behavior in terms of poor diet and exercise is the result of rational choice and weight gain is a side effect of welfare-enhancing technological change. Contrary to the approach developed by the rational-choice perspective with its laissez-faire implications, this paper underlines that in a world with less than perfect information, externalities, self-control problems, endogenous preferences and social inequalities there is a potential positive role for well-designed public policies. While individual responsibility is clearly crucial, it does not seem enough in the absence of appropriate public policies.

Our second topic regards how to build an effective portfolio of policy instruments. The causes of obesity are so numerous and diverse that they require action on several fronts. The key to tackling successfully the problem is more intelligence and a rich set of tools. In particular, we suggest to focus not only or not mainly on food policies but also and particularly on several non-food public policies that while are worth implementing for other objectives (environmental issues, social cohesion, urban planning) can also have a positive impact on calories expended. We show that an integrated multi-factor and multi-stakeholder approach based on a complementary range of actions, programs and measures can lead not only to more effective policies but also to higher cost-effectiveness.

In Section 4, we have provided empirical evidence supporting the hypothesis that food intake plays an important role to explain weight gain in Europe. The increases in the obesity rates in Europe cannot be explained without referring to the role of calories intake, although some countries reveal weight gains in the absence of significant increases in food calorie intake. A clear prediction of the conceptual framework adopted in this paper is that in the absence of a more effective governance of the phenomenon, overweight problems will tend to increase. This means that we need more stringent public policies and much more commitment to the issue by several stakeholders.

Current approaches in Europe are still essentially based on education and information campaigns, although in several European countries, national policies are increasingly adopting broader and better designed policies, integrating nutrition policy with additional instruments and policy tools through a multi-factor and multi-stakeholder strategy.

This approach should be adopted at the European Union level as well. As we have seen in Section 5, the EU recognizes the significance of the threat posed by overweight and obesity and is setting the stage for a new, more effective approach. At least in principle, it supports the need of a shift from traditional information-based policies to a broader, integrated approach. The EU Commission is moving the first steps in this direction. Recently, Krugman (2005) pointed out that in the United States "proposals to do something about rising obesity rates must contend with a public predisposed to believe that the market is always right and that the government always screws things up." In Europe anti-government prejudices seem less marked and generally the attitude to realize that government interventions may be successful is stronger. Given that overweight and obesity problems are here to stay, it is likely that European countries will move in this direction.

References

- Astrup A. (2001), Healthy lifestyles in Europe: prevention of obesity and type II diabetes by diet and physical activity, *Public Health Nutrition*, 4(2B), 499-515.
- Attree P. (2006), A critical analysis of UK public health policies in relation to diet and nutrition in low-income households, *Maternal and child nutrition*, 2, 67-78.
- Caballero B. (2005), A Nutrition Paradox – Underweight and Obesity in Developing Countries, *New England Journal of Medicine*, 352(15).
- Chou, S.-Y., M. Grossman and H. Saffer (2002), *An economic analysis of adult obesity: results from the Behavioral Risk Factor Surveillance System*, Working Paper 9247, National Bureau of Economic Research, Cambridge, MA.
- Commission of the European Communities (2005) Green Paper, *Promoting healthy diets and physical activity: a European dimension for the prevention of overweight, obesity and chronic diseases*, Brussels.
- Connor J. M. (1994), North America as a Precursor of Changes in Western European Food Purchasing patterns, *European Review of Agricultural Economics*, 21(2).
- Cutler, D. M., E. L. Glaeser, J. M. Shapiro (2003), Why Have Americans Become More Obese? *The Journal of Economic Perspectives*, 17(3), 93-118.
- Drichoutis, A. C., Lazaridis P., Nayga R. M. Jr. (2005), Who is Looking for Nutritional Labels? *EuroChoices*, 2005, 4(1), 18-23.
- Eurodiet (2000), <http://ec.europa.eu/health>
- European Commission (2006), <http://ec.europa.eu/health>
- European Snacks Association (2006), Obesity and Overweight, *Fact Sheet 06*, www.esa.org.uk
- Freeman R. B. and R. Schettkat (2005), Marketization of household production and the EU-US gap in work, *Economic Policy*, January, 5-50.
- Garde A. (2006), *The Regulation of Food Advertising and Obesity Prevention in Europe: What Role for the European Role?* (May 2006). EUI Working Papers LAW No. 2006/16, Available at SSRN: <http://77ssrn.com/abstract=910877>
- Flegal K. M., Graubard B. I., Gail M. H. (2005), Excess Death Associated With Underweight, Overweight, and Obesity, *JAMA*, 29(3): 1861-1867.
- IOTF-EASO (2002), *Obesity in Europe. The case for action*, London, September.
- IOTF (2003), *Waiting for a green light for health? Europe at the crossroads for diet and disease*, Obesity in Europe, Position Paper, September.
- IOTF-EASO (2005), *EU Platform on Diet, Physical Activity and Health*, March 15, Brussels.
- Kinsey J. D. (2001), The New Food Economy: Consumers, Farms, Pharms and Science, *American Journal of Agricultural Economics*, 83(5).
- Krugman P. (2005), Free to Choose Obesity? *New York Times*, July 8.
- Kuchler F. and E. Golan (2004), Is There a Role for Government in Reducing the Prevalence of Overweight and Obesity? *Choices*, Fall, 41-45.
- Kuchler F., E. Golan, J. N. Variyan and S. R. Crutchfield (2005a), Obesity Policy and the Law of Unintended Consequences, *Amber Waves*, U. S. Department of Agriculture, Economic Research Services, <http://www.ers.usda.gov>
- Kuchler F., A. Tegene and J. M. Harris (2005b), Taxing Snack Foods: Manipulating Diet Quality of Financing Information Programs? *Review of Agricultural Economics*, 27(1), 4-20.
- Kyprianou M. (2005), *Speech for the opening session of the 7th Annual Meeting of the Transatlantic Consumer Dialogue (TACD)*, Annual Meeting of TACD, Washington, April 18.
- Lobstein T. and M. L.Frelut (2003), Prevalence of overweight among children in Europe, *Obesity Reviews* 4, 195-200.
- Lobstein T. (2004), Suppose we all ate a healthy diet...could our food supplies cope? *Eurohealth* 10(1), 8-12.

Lakdawalla, D., T. Philipson (2002), *The growth of obesity and technological change: a theoretical and empirical investigation*, Working Paper 8965, National Bureau of Economic Research, Cambridge, MA.

Lakdawalla D., T. Philipson and J. Bhattacharya (2005), Welfare-Enhancing Technological Change and the Growth of Obesity, *American Economic Review*, 95(2), 253-57.

Lang T., G. Rayner (2005), Obesity: a growing issue for European policy? *Journal of European Social Policy*, 15(4), 301-327.

Loureiro M., L. Nayga Jr., Rodolfo M. (2005), International Dimensions of Obesity and Overweight Related Problems: An Economics Perspective, *American Journal of Agricultural Economics*; 87(5), 1147-1153.

MINTel (2006), *Consumer Goods Europe*, March, No. 520.

Nestle M. (2002), *Food politics: How the food industry influences nutrition and health*, University of California Press, Berkeley.

OECD (2005), *Health at a Glance: OECD Indicators*, OECD, Paris.

OECD (2006), *OECD Health Data*, OECD Paris: <http://www.oecd.org/health/healthdata>.

Philipson T., R. A. Posner (1999), *The Long-Run Growth in Obesity as a Function of Technological Change*. Working Paper 7423, National Bureau of Economic Research, Cambridge, MA.

Philipson T., C. Dai, L. Helchen (2004), *The Economics of Obesity*, Economic Research Service, USDA, E-FAN-04-004.

Prentice W. A. and S. A. Jebb (1995), Obesity in Britain: Gluttony or sloth?, *British Medical Journal*, 311, 437-439.

Robertson A., C. Tirado, T. Lobstein, M. Jermini, C. Knai, J. H. Jensen, A. Ferro-Luzzi and W.P.T. James (Eds.), (2004), *Food and Health in Europe: a new basis for action*, WHO Regional Publications, European Series, No. 96.

Senaeur B. (2000), Changes and Trends in Consumption Patterns, *The American Consumer and the Changing Structure of the Food System*, Arlington, Virginia, May 3-5.

Smith T. G. (2004), The McDonald's equilibrium, advertising, empty calories, and the endogenous determination of dietary preferences, *Social Choice Welfare*, 23, 383-413.

Smith T. G. (2006), Reconciling Psychology with Economics: Obesity, Behavioral Biology, and Rational Overeating, May 31, 2006

Srinivisan C. S., X. Izz and B. Shankar (2006), An assessment of the potential consumption impacts of WHO dietary norms in OECD countries, *Food Policy*, 31, 53-77.

Venturini L. (2002), The Food System in Transition: An EU Perspective, *The ICFAI Agricultural Economics*, 1(1), 61-81.

World Health Organization (1997), *Obesity: Preventing and Managing the Global Epidemic*. World Health Organization, Geneva.

World Health Organization (2000), *The Impact of Food on Public Health*. Case for a Food and Nutrition Policy and Action Plan for the WHO European Region 2000-2005, WHO Regional Office for Europe, Working Draft, 15 May.

World Health Organization (2005), *Global Strategy on diet, health and physical activity*. Strategy Document No. WHA57.17, 22 May, Geneva.

Zywicki, Todd J., D.Holt and M. K. Ohlhausen (2004), Obesity and Advertising Policy, *George Mason Law Review*, 12(4), 979-1011. Available at SSRN: <http://ssrn.com/abstract=604781> or DOI: 10.2139/ssrn.604781.