



Grant agreement no.: 226713

## **Work Package 1**

Benchmarking nutrition policies in Europe, their evaluation and identification of successes and failures

### **Review of policy actions, data available for their analysis and existing evaluations throughout Europe.**

#### **Deliverable 1.1**

Date due: Month 12

Main responsibility for this document: UNIBO  
with input from AU, UGENT, UREAD, INRAN, JUMC, KRAFT and EUFIC

**ACKNOWLEDGEMENTS**

The authors gratefully acknowledge the European Community's financial support under the Seventh Framework Programme for Cooperation, Theme Food, Agriculture and Fisheries, and Biotechnology, Contract 226713.

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**Deliverable 1.1 Benchmarking nutrition policies in Europe, their evaluation and identification of successes and failures**

**Abstract**

The aim of deliverable 1.1 is to provide a survey, classification and assessment of evaluations of relevant policy interventions aimed at healthy eating, with the following specific objectives:

- a) Provide an up-to-date picture and classification (mapping) of policy actions, with a special focus on those currently implemented in Europe (mapping of European interventions has been integrated with the most prominent policy experiences outside Europe)
- b) Collect any information on existing ex-post evaluations of the effectiveness of these policy actions within Member States
- c) Supplement this information with an updating of reviews of academic literature on policy effectiveness
- d) Explore the feasibility of additional indirect ex-post evaluations based on the availability of appropriate data.

We define healthy eating as adherence to the nutrition recommendations of the World Health Organisation (WHO). By policy intervention we refer to any government action which can affect people’s healthy eating behaviour by (a) supporting more informed choice; (b) changing the market environment for food. Within these broad categories we define a range of 16 policy intervention types within which we classify individual policies in Member States.

A total of 119 relevant policy interventions were identified in Europe, the majority in Scandinavian countries, the UK and, in more recent years, France. Mediterranean and Transition countries have only a recent history of action, mostly confined to information and education areas, with relatively low budgets. Indeed across Europe as a whole information measures account for two thirds of actions, almost all of which are public information campaigns (such as 5-a-day) and education measures in schools. Regulation of food available in schools accounts for half of the 29 identified measures which change the market environment, though recent interventions here focus on targeting disadvantaged consumers (vouchers and availability measures targeted at ‘food deserts’). Government-industry interaction to promote voluntary reformulation accounts for one third of identified market measures.

It is striking how few measures have been formally, let alone comprehensively, evaluated. Most common have been evaluations of the impact of information campaigns on consumer/citizen attitudes and campaign recall. A number of evaluations have also looked at the impact on consumption (mostly claimed consumption rather than actual intake) and BMI, though rather crudely in the sense that they rely on simple before and after treatment measures without controlling for confounding influences. Three studies have attempted to look at costs of intervention, but none has been found that formally assesses costs and benefits in a rigorous manner, or even attempts a cost effectiveness (e.g. cost per life saved) or cost-utility (cost per QALY/DALY) measure.

Looking at the academic as well as government literature, the following broad generalisations can be made:

## Information Measures

- Advertising bans of unhealthy foods to children appear to have some success in changing attitudes and behaviour, though the evidence for the latter proposition is a single (well-conducted) study in Canada where Quebec alone among Canadian Provinces has long had such a ban.
- Most evaluations of social marketing campaigns report increases in knowledge and awareness, but there is no strong evidence about their effectiveness in terms of changing actual behaviour, or health markers like body mass, cholesterol level or blood pressure. This may be because social norms only change very slowly, over a period of decades, whereas evaluations tend to examine much more recent post-intervention data.
- Nutrition education measures interventions have generally been evaluated only with limited geographical scope and intensity which makes it difficult to generalise effectiveness findings, though studies support school-level interventions improving knowledge and consumption.
- Nutrition labelling is vital to informed choice which is the basis of economic decision making. However, informed choice is not necessarily healthier: labelling may improve consumers' economic welfare by enabling them to make informed choice while yielding no improvements in diet and health. Our sister project, FLABEL, is examining in depth all aspects of the use and impact of various types of nutrition labelling.
- Information on menus is insufficiently widespread to have been formally evaluated.

## Market Measures

- Fiscal interventions are a direct way to make individuals pay the social costs of their food. Also, a small tax on certain foods, even if not inducing behaviour change, could raise valuable funds for health promoting interventions. The only example of such measures is the "twinkie tax" in 30 States of the US. While *fat taxes*' distributional effects might be regressive, their health effects are progressive (poor consumers change their diets most in response to fiscal incentives). There is potential for differential VAT rates to be used as a measure to encourage healthy eating and raise revenue for pro-healthy eating interventions.
- Targeting disadvantaged consumers with vouchers which can only be used for healthy foods is a new and promising intervention which will need to be evaluated. In particular there is an issue as to how much such measures increase consumption of healthy foods as opposed to displacing existing expenditure.
- Measures to influence availability of food in schools include provision of fruit and healthy snacks, regulation of nutritional quality of school lunches and banning of vending machines. Such measures are quite common in Europe, but also the US, Japan and elsewhere. Limited evidence suggests their impact is positive. Workplace meal provision for adults is on the future policy agenda.
- The only formal nutrition-related standard is the banning of trans-fats in Denmark, though this measure has not yet been evaluated. Becoming more common are government-industry collaborations for reformulation, such as reducing salt and saturated fat as well as trans-fats.

In conclusion it is clear that policy evaluation is at an early stage and largely *ad hoc*. We have identified a number of interventions amenable to more formal and rigorous evaluation of the impact of measures on actual consumption while controlling for confounding factors. This work will be carried out in the next phase of EATWELL (WP2).

## Introduction

The general aim of deliverable 1.1 is to provide a survey, classification and assessment of evaluations of relevant policy interventions aimed at healthy eating, with the following specific objectives:

- e) Provide an up-to-date picture and classification of all the policy options, with a special focus on those currently implemented in Europe (mapping of European interventions has been integrated with the most prominent policy experiences outside Europe)
- f) Collect any information on existing ex-post evaluations of the effectiveness of these policy actions within Member States
- g) Supplement this information with an updating of reviews of academic literature on policy effectiveness
- h) Explore the feasibility of additional indirect ex-post evaluations based on the availability of appropriate secondary data.

## Policy mapping

Given the multiplicity and the variety of actions which may affect people's diets, we adopt two definitions to confine the scope of our survey. First, we consider as *healthy eating* the adherence to the nutrition recommendations of the World Health Organisation (WHO)<sup>1</sup>. Second, by *policy intervention* we refer to any government action which can affect people's healthy eating behaviour by (a) supporting more informed choice; (b) changing the market environment<sup>2</sup>.

Thus private sector, NGO and academia actions in nutrition are outside the scope of study unless part of a wider government action. Furthermore, given that there are literally thousands of very micro-level nutrition 'experiments' that have been conducted in Europe, we need to limit our scope by only considering policies that are either national, regional or at least city-level in scope. In this means we respond to the EC call for proposals by concentrating on actions that governments might take and assessing if they work.

The above definitions generate the list of policy actions to be considered in the survey, which extends the list provided in Mazzocchi, Traill and Shogren (2009). The survey covers the following European countries: Belgium, Germany, Denmark, Spain, Finland, France, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Sweden, United Kingdom and it is then extended to relevant interventions in other countries, where this was necessary to achieve an exhaustive mapping by policy intervention type. It should be noted that the survey cannot be considered exhaustive. Table 1 shows the distribution of the interventions by policy action typology and country, while the complete list of interventions is provided in a specific report on mapping of policy intervention (Appendix 1).

The survey resulted in 127 policy interventions (119 in Europe) selected for the mapping. In general, consolidated and systematic healthy eating policy actions other than information campaigns examples in Europe are confined to few cases in Scandinavian Countries and the UK, with France as a newcomer. Instead, Mediterranean countries and other countries considered in this survey have only a recent history of policy actions and mostly confined to information and education measures, with low budgets and fragmented strategies.

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<sup>1</sup> See World Health Organization (WHO)/Food and Agriculture Organization (FAO). Diet, Nutrition and The Prevention of Chronic Diseases. Report of a Joint WHO/FAO Expert Consultation. WHO Technical Report Series No. 916. Geneva: WHO, 2003.

<sup>2</sup> Some policies may be articulated in several interventions, in which case they are listed as separate policy actions, although the reference to the broader policy umbrella will be provided.

The bias towards less controversial information and education actions compared to market-level interventions which usually generate direct costs for economic agents is clear from the distribution between policies supporting “more informed choices” and those aimed at changing the market environment. In our survey, considering EU countries only, 80 policy actions are classified in the first category and only 29 in the latter. Public information campaign and education measures are by far the most common type of action (73 interventions), as even within the information support policies there seems to be less inclination towards policies affecting market behaviours, like advertising controls (3 cases listed in Europe) or labelling regulations (4 cases, although the EU implements a EU-wide policy for health claims). Similarly, within the policies that operate at the market level, these mainly concern regulating school environments (13 out of 29) and government actions targeted at prompting private sector response (10 out of 29), mainly through public-private agreements.

**Table 1. Selected interventions according to our classification of healthy eating policy actions**

Policy classification	Country																					
	Total	EU	AU	BE	DE	DK	ES	FI	FR	IE	IE & NI	IT	NO	PL	PT	SE	UK	CA	JP	US		
<b>Supporting more informed choice</b>	<b>84</b>	<b>80</b>	<b>1</b>	<b>3</b>		<b>7</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>2</b>		<b>1</b>	<b>21</b>	<b>2</b>	<b>10</b>	<b>8</b>	<b>3</b>	<b>11</b>		<b>2</b>	<b>2</b>	
<b>Advertising controls</b>	<b>4</b>	<b>3</b>								<b>1</b>	<b>1</b>								<b>1</b>	<b>1</b>		
<i>On advertising to children</i>	<i>3</i>	<i>2</i>									<i>1</i>								<i>1</i>	<i>1</i>		
<i>On general advertising</i>	<i>1</i>	<i>1</i>							<i>1</i>													
<b>Public information campaigns</b>	<b>39</b>	<b>38</b>	<b>1</b>	<b>3</b>		<b>4</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>		<b>1</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>8</b>		<b>1</b>		
<b>Nutrition education</b>	<b>35</b>	<b>35</b>				<b>3</b>	<b>2</b>		<b>2</b>				<b>13</b>	<b>1</b>	<b>7</b>	<b>6</b>		<b>1</b>				
<i>For children at school</i>	<i>31</i>	<i>31</i>				<i>3</i>	<i>2</i>		<i>2</i>				<i>12</i>	<i>1</i>	<i>5</i>	<i>5</i>		<i>1</i>				
<i>For adults / generic public (e.g. at Workplace)</i>	<i>4</i>	<i>4</i>											<i>1</i>		<i>2</i>	<i>1</i>						
<b>Nutritional labelling</b>	<b>5</b>	<b>4</b>						<b>1</b>							<b>1</b>		<b>1</b>	<b>1</b>			<b>1</b>	
<b>Nutritional information on menus</b>	<b>1</b>	<b>0</b>																				<b>1</b>
<b>Changing the market environment</b>	<b>33</b>	<b>29</b>		<b>1</b>		<b>4</b>	<b>6</b>	<b>1</b>	<b>3</b>				<b>4</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>3</b>		<b>1</b>	<b>1</b>	<b>2</b>
<b>Fiscal Measures</b>	<b>4</b>	<b>3</b>													<b>2</b>			<b>1</b>				<b>1</b>
<i>Tax/subsidies on foods to the population at large</i>	<i>1</i>	<i>0</i>																				<i>1</i>
<i>Subsidies to disadvantaged consumers</i>	<i>3</i>	<i>3</i>													<i>2</i>			<i>1</i>				
<b>Regulate meals</b>	<b>15</b>	<b>14</b>		<b>1</b>		<b>2</b>			<b>3</b>				<b>4</b>	<b>2</b>			<b>1</b>	<b>1</b>		<b>1</b>		
<i>School meals</i>	<i>13</i>	<i>13</i>		<i>1</i>		<i>1</i>			<i>3</i>				<i>4</i>	<i>2</i>			<i>1</i>	<i>1</i>				
<i>Workplace canteen meals</i>	<i>2</i>	<i>1</i>				<i>1</i>															<i>1</i>	
<b>Nutrition-related standards</b>	<b>1</b>	<b>1</b>				<b>1</b>																
<b>Government action to encourage private sector action</b>	<b>10</b>	<b>9</b>				<b>1</b>	<b>6</b>	<b>1</b>							<b>1</b>							<b>1</b>
<b>Availability measures for disadvantaged consumers</b>	<b>2</b>	<b>2</b>				<b>1</b>														<b>1</b>		
<b>Liability laws</b>	<b>1</b>	<b>0</b>																				<b>1</b>
<b>Not explicitly targeted at healthy eating</b>	<b>4</b>	<b>4</b>													<b>3</b>				<b>1</b>			
<b>Generic</b>	<b>6</b>	<b>6</b>			<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>						<b>1</b>			<b>1</b>				
<b>TOTAL</b>	<b>127</b>	<b>119</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>12</b>	<b>11</b>	<b>3</b>	<b>9</b>	<b>2</b>		<b>1</b>	<b>25</b>	<b>4</b>	<b>16</b>	<b>10</b>	<b>4</b>	<b>16</b>		<b>3</b>	<b>1</b>	<b>4</b>

Source: adapted from Mazzocchi, Traill and Shogren (2009)

For a few policies we were unable to find measures in Europe. These are fiscal measures for the population at large and liability laws. While the former are now being considered in some countries and are the subject of a growing policy and academic debate, liability laws are unlikely to be a realistic instrument given the European law system.

### **Evaluation of evaluations.**

The existing evidence on the efficacy of the alternative policy actions detected through the mapping exercise has been reviewed. Interventions efficacy has been here defined according to the following three dimensions: 1) impact on attitudes, behaviour and consumption; 2) impact on obesity and health; 3) cost-effectiveness and cost-utility. *Evaluation of evaluations* has the objective of drawing some preliminary conclusions about what interventions work, what ones do not and for what ones information is too incomplete. Of the 119 interventions in Europe included in the mapping, few were formally evaluated: 22 had some evaluation of their impact in terms of awareness and 27 evaluated their impact on consumption. Further, 16 actions provided some evaluation of health impact. Finally, only three actions had specifically measured any cost-benefit. The remaining actions did not have any relevant formal evaluation in terms of awareness, consumption, health or cost/benefit. The full list is presented in the Report on “Evaluation of Evaluations” (Appendix 2, see Annex 1).

Impact on attitudes is thus the most common impact assessment performed. Yet, measurement approach and impact indicators vary dramatically across different interventions: attitudes changes have been measured in terms of increased knowledge of specific healthy eating issues, number of individuals remembering messages of the campaign, etc. More basic indicators of diffusion are often used (in particular in the case of information campaigns) such as the number of individuals who have been touched by the intervention (e.g. by hearing the message of an information campaign) or simple “acceptance” indicators as voluntary participation rate in some cases. Claims of intentions of future behavioural changes are also used as indicator of impact on attitude.

Impact on behaviour normally refers to changes in consumption, i.e. changes in the actual level of intake of specific food items (e.g. fruit and vegetables or milk) or nutrient. Possible behavioural changes are sometimes assessed recording daily eating habits (e.g. snacking, having or skipping breakfast, consuming at least 5 portions of fruit and vegetables per day, etc.). Finally, claims of behavioural changes are often used as indicators of actual changes.

The most common way to evaluate the impact on health is to look at prevalence levels of overweight and obesity, derived from Body-Mass-Index (BMI). Only in one case (North Karelia Project in Denmark) impact on health has been measured by referring to Cardio-Vascular Disease (CVD) mortality reduction.

When official evaluations are implemented the common practice is to compare pre-post level of the chosen indicators. In some cases control group are defined and used for rigorous impact assessment<sup>3</sup>. When control groups do not exist pre-post outcome comparison of risk is an inappropriate indicator of the effect of an intervention. In the absence of some estimate of the counterfactual outcome level, possible changes due to external factors (and independent of the policy) might mitigate or magnify the perceived effect of the intervention. For example the North Karelia Project claimed success because of sharp reductions in saturated fat consumption and

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<sup>3</sup> Theoretically individuals should be assigned randomly to the treated group or to the non-treated group, so that there is no selection bias. From this condition will follow that the non-exposed group is not systematically different from the treated group and the former can be considered as a *control group*. This is the case of experimental data.

reductions in heart disease deaths, but since these also occurred in a number of other countries with no equivalent programme, they were most likely caused by some other external environmental influences.

The summary results which follow are drawn from the evaluations conducted in Member States, as reported in Appendix 2, and the review of literature (Appendix 3).

## **1. Supporting more informed choice**

### ***1.1 Advertising controls***

Under this heading, the survey focused on advertising controls explicitly targeted at healthy eating. Within the survey, only 4 cases of advertising control were selected. All over Europe advertising regulations are common in reference to minors and regardless the kind of product that is promoted (e.g. restrictions on the timing and the content of television advertising to children exist almost everywhere). Also with regard to the food area advertising regulation is mainly meant to protect minors. Special rules on food advertising to children exist in the UK, Belgium, France, Denmark, Finland, Ireland, Netherlands, Portugal and Spain (in these last two cases they are “self-regulatory codes”, see following sections). The recent French law on food advertising (regardless of age) is an example of generic advertising control and provides that each food advertisement has either to be followed by public health messages or companies are subject to a 1.5% tax on their overall food advertising budget.

Finally the Quebec ban on advertising to children under 13 has been highlighted. It dates back to 1980<sup>4</sup> and is especially interesting, because it constitutes an ideal natural experiment for testing the policy effects, as the neighbouring province of Ontario has not been subject to similar restrictions.

Thanks to the particular geographical setting the Quebec ban has been evaluated by matching similar individuals between the two regions and adopting a difference-in-difference approach. Baylis and Dhar (2007) estimate a magnitude of the policy impact ranging from a decrease of 11 to 22 million fast food meals per year due to the ban. This amount translates into 8.9 to 23 billion calories, and the authors show some persistence of the effect as young children grow into adulthood.

The effects of British Ofcom code on children have been evaluated in terms of children’s exposure to advert messages on TV<sup>5</sup>, while the French law on food advertising has been evaluated (through a survey conducted in October 2007 by the National Institute of Prevention and Health Education) in terms of the understanding of the messages, and the incentive to change behaviour (self-reported behaviours): 21% of individuals above 15 have changed their eating habits and 17% their food purchasing habits in response to the health messages included in the food advert<sup>6</sup>.

The general view from the literature is that banning unhealthy food advertising to children is effective, but the impact could be diluted if the food industry substitutes food advertising other forms of marketing.

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<sup>4</sup> See Baylis & Dahr (2007), <http://www.aae.wisc.edu/events/papers/AppEcon/2007/baylis.11.07.pdf>.

<sup>5</sup> See <http://www.ofcom.org.uk/media/speeches/2008/12/hfssslides.pdf>

<sup>6</sup> <http://www.inpes.sante.fr/70000/dp/08/dp080204.pdf>

## 1.2 Public information campaigns

Public information campaigns are understood here as interventions which exploit media communication and other social marketing tools to improve individual and social knowledge about health issues connected to food habits, and directed to any kind of target population. It is by far the most common healthy eating policy, together with education interventions.

Information policies specifically developed to address rising obesity rates are common (e.g. the British Change4Life) and widespread information actions are also planned within generic policy frameworks like those of the Portuguese Platform Against Obesity or the German Platform for Diet and Physical Activity.

In other cases, healthy eating messages are provided in association with specific health risks like cancer, heart diseases or diabetes (as in the British “Take life on, one step at a time”, the Finnish North Karelia project, or the French National program to reduce cardiovascular risk).

The target may also be a specific food issue. There’s an increasing number of communication campaigns to reduce salt intakes (the UK salt campaign by the Food Standard Agency or the Italian “Salt in Food”), in Poland and Denmark there are also information campaigns to encourage fish consumption<sup>7</sup>. Yet, the most widespread action is the one emphasising the need to reach the target intake of fruit and vegetables, generally based on the “5 portion a day” message (as the UK “5 a day”). Public policies to promote fruit and vegetable consumption exist in most European countries (sometimes they are articulated slightly differently, e.g. “6-a-day” in Denmark or the East Finland Berry and Vegetable project).

Most of the interventions have been evaluated exclusively in terms of impact on *awareness*. With regard to the Italian “Feast of the colour of life” 77% of consumers who had seen the nutritional messages correctly remembered the name and content of the campaign after more than 10 days and 56% of those who stated to consume less than 5 servings of fruits and vegetables a day were willing to increase their consumption as direct consequence of the information received. Similarly, with reference to the Polish milk program, the advertisement was remembered by 27% of mothers and 44% of children; 73.4% of mothers said that the campaign increased their level of knowledge about milk and milk products and 89.4% of children declared their knowledge of milk and milk products increased. Moreover, awareness of the Polish information campaign “five servings of fruit, vegetables or juice” increased in time: the number of women declaring to know the campaign increased from 27% in 2008 to 41% in 2009.

Some other interventions have been evaluated also in terms of changes in *claimed behaviour* (e.g. Italian “Eat well, live healthy” with 37.8% respondents in the evaluation survey declaring to have improved their dietary habits as consequence of the campaign).

One of the most interesting official evaluations – at least in terms of impact on attitudes- refers to UK's Eat Well to keep well campaign in 1998. The intervention was evaluated in a sample of 602 people (older than 16). As result, 71% of respondents were aware of healthy eating advertising, and over 52% recognised the 'Eat well to keep well' campaign specifically. Over 80% had seen or heard advertising relating to fruit and vegetables and 69% of these said the advertising had increased their healthful behaviour.

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<sup>7</sup> These actions are primarily supported by Agriculture and Fishery authorities or the Fishery industry and the health objective is integrated with a generic product advertising objective.

Actual consumption levels have been used to assess effect on *behaviour* of campaigns promoting fruit and vegetable consumption. A detailed literature review of ex-post impact assessment of this kind of interventions in Europe and US has shown that the average effect on consumption is roughly between +0.2 and +0.6 portions per day (Pomerleau et al., 2005). Western Australian Go for 2&5 evaluation (based on a pre-post survey) has highlighted an increasing of 0.8 servings/day for adults during the program period, with a following decrease of 0.3 portions after the end of the campaign (Pollard et al., 2008).

In the US, the impact assessment of the worksite-based interventions included in the 5 a day for Better Health campaign has shown a pre-post increasing of 19% of consumption levels, reflecting a difference of one half serving (Sorensen et al., 1992). The evaluation of the whole US 5 a day program (which is made up of multiple initiatives, designed at national level and locally implemented) through two nationally representative pre and post surveys (in 1991 and in 1997) has shown a statistically significant improvement in consumption level from baseline to follow-up survey (from 3.75 to 3.98 per day for the total population). However the adjusted analysis revealed that the positive change was probably attributable to demographic changes between the two survey years, correlated with vegetable and fruit consumption. Nonetheless the same study points out that the program awareness (measured as the percentage of people aware of the 5 a day message) has significantly changed among the total population and all the demographic subgroups (Stables et al., 2002).

The evaluation of the Danish “6 a day” the campaign reported that 84% of respondents was aware of the campaign in 2007, and that the daily intake of fruits and vegetables in the same year was 3.42 compared to 2.87 portions in 1998 (highest 3.79 in 2002).

Official evaluations of the local community initiatives included in the British “5 a day” program has been carried out through a pre and post-intervention survey administered to both an intervention and a control group (Bremner et al., 2006). F&V consumption is measured through a 5-a-day index representing the number of portions consumed in a typical day. The pre-post survey highlighted an increase of the index from 3.36 to 3.64 for the programme areas and a slighter increase from 3.49 to 3.64 for the control areas. Although the change in the group involved in the local initiatives is not significantly different from the change in the control group, the overall positive change (across the entire group) is statistically significant (Bremner et al., 2006).

A classic example of a “community based” intervention that went from local to national, had follow-up and its impact evaluated is Finnish North Karelia Program. It was launched in Finland with the aim to tackle the high cardio-vascular mortality that occurred in the years 1970's. The Program included specific dietary changes like reduction of saturated fat consumption and increase in the consumption of unsaturated fat, fruits and vegetables. This comprehensive action included educational programs, actions via health services and schools and multi-sector collaboration (NGO's and private sector). The action was further implemented in the whole country.

In conclusion, while nationwide information campaigns have been widely evaluated through ad-hoc surveys or relying on secondary consumption or expenditure data, most official evaluations report increases in knowledge and awareness, but there is no strong evidence about their effectiveness in terms of changing actual behaviour, or health markers like body mass, cholesterol or blood pressure. This may be because social norms only change very slowly, over a period of decades, whereas evaluations tend to examine much more recent post-intervention data. Only Sassi et al (2009) have attempted to measure costs which they put at \$2.27 per target individual, but without an assessment of the value of benefits it isn't clear if the cost benefit ratio is favourable.

### 1.3 Nutrition education

Nutrition education measures are closely related to information campaigns as they aim to change knowledge and information levels. To distinguish between information campaigns and education measures, the following actions are included under the education heading:

- any policy action which deals directly with schools (i.e. involving pupils, teachers, or school officers)
- any policy action which exploits tools that are typical of education: training, seminars, lectures, etc.. regardless of the age of the target subjects.

School-level or workplace interventions which affect meals (e.g. the provision of free fruit) are not included under this heading and are discussed in a separate section.

Considering this classification, 35 nutrition education interventions were included in the survey, 31 of them targeted at schoolchildren and only 4 directed at society at large. Of these 35 interventions, 13 were in Italy, due to the regional policy decision-making structure for health interventions.

Some interesting evaluations which explore attitude and behavioural impact measurement exist, especially in Mediterranean countries which are suffering rising obesity rates, and even higher in childhood. Quite common is the assessment in term of rate of *participation* in the program (e.g. Danish “All about diet”: 51% of evaluated task-force visits found a policy of school food) and impact on attitudes (see the Italian “Fruit snack”, 67% of the students involved in the project, stated that their nutritional knowledge about the importance of fruit and vegetables consumption was improved). But also changes in *consumption* are investigated. Quite interesting, although very small, are the Italian “Nutritional education: an integrated intervention” and “Regional project for nutritional surveillance and education in schools”. With reference to the former the proportion of children reporting snack consumption (not fruit) at school was 16% among children involved in the project and receiving fruit at school, while it reached 76% among control children (not participating in the project and not receiving fruit at school). By contrast, there was no change in the number of children having breakfast every day (pre-intervention 71% - post-intervention 72%); the proportion of children who had healthy snacks 1-2 times a day rose marginally (pre-intervention 75.7% - post-intervention 78.6%).

The outcome of school-level interventions can be effectively monitored over time, but most of the interventions have a limited geographical scope and intensity which makes it difficult to generalise effectiveness findings<sup>8</sup>. The Portuguese (“Community weight”) and the Italian (“Piemonte Obesity Project”) interventions directed to adults with the aim of reducing obesity prevalence have been both positively evaluated the first in terms of reduction of calories (-6.3%), cholesterol (-9.2%) and saturated fat intake (-15.6%) and the second in terms of incidence of subjects with significant weight losses (38% of participants).

Again we must conclude that evaluation has been partial rather than systematic. Kan and Tsai (2004) for example show that, not surprisingly, the response to education about the impact of obesity on health is more significant among the overweight and obese than among those of normal weight, whereas most studies look, if at all, at mean responses.

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<sup>8</sup> For some programmes running at a large-scale (for example the Portuguese project Zero Obesity and Health against Obesity, the Spanish Perseo program, the French Epode program) there’s an explicit plan of monitoring BMI and lifestyle variables and the evaluations that will be produced in the forthcoming years might be very informative.

## 1.4 Nutritional labelling

By ‘nutritional labelling intervention’ we mean any regulation covering general labelling on food (which foods have to carry nutritional information, what type of nutrition information should be reported, etc.).<sup>9</sup> The debate over nutrition labels is quite active in Europe<sup>10</sup> where labelling is regulated through the Council Directive of 24 September 1990 on nutrition labelling for foodstuffs (90/496/EEC) which specifies the labelling format to be used when, according to national norms, nutrition information is to be included on the packaging of a food product. This original Directive has been followed by some subsequent acts regarding further norms for labelling and health claims<sup>11</sup>.

Only 4 relevant labelling acts were found in our survey. The most prominent ones are certainly the ‘keyhole’ symbol adopted in Sweden, Norway and Denmark, and the heart symbol adopted in Finland. The use of health symbols in products which meet some specific nutritional characteristics is normally aimed at increasing consumer awareness, but also to encourage food processors to reformulate products in order to be eligible. The UK Food Standard Agency is currently encouraging on a voluntary basis the use of the so-called “traffic light” system for classifying foods in term of nutritional content. A long history of labelling regulation is also associated with the US Nutrition Labelling and Education Act (NLEA), introduced in 1990 and followed by labelling norms in 1993.

There have been several economic evaluations of the costs and benefits of the US NLEA and a positive balance was found especially with higher estimates of misleading claims prior to the introduction of the regulation. Cowburn and Stockley (2005)<sup>12</sup> found evidence that consumers who actually make use of the nutrition labels seem to understand some of the terms reported within the labels, but tend to get confused by others. Nevertheless, their study found evidence that improving nutritional labelling could make a small contribution allowing the point-of-purchase decision more favourable towards the selection of healthy foods.

From an economic perspective there is an ongoing debate in the literature about the costs and actual health benefits or improvements in nutrition due to nutritional labelling. Some studies show that in general, labelling helps or induces people to avoid bad nutrients, however it does not necessarily encourages people to buy good nutrients (e.g. information on fiber contents, see **Garretson and Burton, 2000**). On the other hand, **Golan et al. (2001)** support that social benefits of labelling offset the costs. In either case, what is clear is that consumers tend to use nutritional labels, and the easier and more concise the information is, the higher the probability they will have an impact on food choices. Furthermore, once nutrition labelling regulation is in place, those consumers who tend to use the labelling are more likely to increase fruit and vegetable consumption while decreasing fat intake (see **Variyam, 2008**).

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<sup>9</sup> Labelling requirements can also be an accompanying feature of information campaigns, as is the case of the UK 5-a-day campaign with the development of a specific logo for those products which contribute to the target.

<sup>10</sup> See the FLABEL EU project, [www.flabel.org](http://www.flabel.org)

<sup>11</sup> Regulation (EC) No 1925/2006 of the European Parliament and of the Council specifies cases in which nutrition labelling is compulsory. Regulation (EC) No 1924/2006 of the European Parliament and of the Council harmonises Member States’ provisions on the labelling of nutrition claims, including those relating to health.

<sup>12</sup> Cowburn and Stockley findings are based on a systematic review of consumer perceptions of food labelling.

From an economic perspective, nutrition information is vital to informed choice which is the basis of economic decision making. However, informed choice is not necessarily healthier as pointed out in **Mazzocchi et al. (2009)**—labelling may improve consumers’ economic welfare by enabling them to make informed choice while yielding no improvements in diet and health.

Our Sister project, FLABEL, is examining in depth all aspects of the use and impact of various types of nutrition label.

### ***1.5 Nutrition information on menus***

While there are cases in Europe where the of nutritional information on menus in restaurants or canteens is part of wider information programs or labelling systems (this is the case of the Portuguese Platform against obesity, or the Swedish Keyhole), specific policy actions in this direction are not common in Europe. Some voluntary schemes or local initiatives<sup>13</sup> do lead to the provision of nutrition information, but no systematic intervention which fits with our definition of policy was found.

Outside Europe, the regulation of nutrition information provided in menus is gaining increasing popularity in the US, to the point that the recent reform of the health system in 2010 includes a measure which requires restaurant chains (20 or more locations across the country) to display calorie content of foods in menus, menu boards, and any posters. State-level regulations which require mandatory nutrition information on menus have already been implemented for some years in various US states (see Annex of mapping report).

The empirical evidence about the actual eating outcomes is weak<sup>14</sup>, although it is accepted that consumers often ignore the presence of unhealthy nutrients in menu items, so that this type of policy goes towards the promotion of informed choice and readdressing an information asymmetry, regardless of the actual benefits in terms of healthy eating. Costs of widespread regulation would need careful consideration, as they may be prohibitive for single or low-outlet restaurants

## **2. Policies aimed at changing the market environment**

### ***2.1 Fiscal measures: tax/subsidies on foods to the population at large and subsidies to disadvantaged consumers***

While there is an ongoing debate in Europe about the adoption of fiscal measures to improve eating habits, no major fiscal measures have been adopted in the European Union<sup>15</sup>. Thus, the only fiscal intervention for the population at large selected in our survey is based on the US policy experience, where the so-called “twinkie-taxes” have been implemented in thirty states. These taxes are generally very small levies applied to foods and drinks of low nutritional values, especially sodas.

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<sup>13</sup> See for example the English Heartbeat Award (Holdsworth et al., 2004)

<sup>14</sup> See Mazzocchi, Traill and Shogren (2009, p. 130) and references therein

<sup>15</sup> A recent exception is the Romanian announcement (January 2010) towards the adoption of a “fat tax” on fast food, soft drinks and sweets, with the objective of raising tax revenues for health programmes. The new tax was expected to be introduced on 1 March 2010, but its implementation has been delayed.

There are estimates that the twinkie taxes generate every year about \$ 1 billion for the states' coffers.

Health-targeted price subsidies for the population at large are practically nonexistent, and price measures are mainly confined to agricultural support, with a strong push by the World Trade Organisation to reduce any form of price intervention.

More common is the institution of subsidies to support healthy eating of target groups and three cases were selected in our survey: the Polish scheme to support children nutrition in disadvantaged families, the Polish program providing price-reduced (or even free) milk to all schoolchildren<sup>16</sup>, and the Healthy Start programme in the UK, explicitly targeted at improving nutrition habits for disadvantaged households, who receive free vouchers which can be swapped for healthy foods or free vitamins. Similar programmes exist in the US (e.g. WIC). All of these programs are too new to have been evaluated, but the schemes are well-targeted and promising,

In the absence of concrete policy interventions of this type, evaluations have been based on simulation using data on the known responsiveness of consumption of different foods to prices. The literature is discussed at some length in Appendix 3 (Literature Review). A shortfall with much of the analysis is that it has to use aggregate-level data from household surveys, whereas many of the interesting substitution opportunities are between healthy and unhealthy options within product categories. Increasing availability of check-out data is leading to more interesting work in this field.

So far the consensus view is that fiscal interventions are a direct way to make individuals pay the social costs of their food. Also that a small tax on certain foods, even if not inducing behaviour change, could raise valuable funds for health promoting interventions. While *fat taxes'* distributional effects might be regressive<sup>17</sup>, their health effects are progressive (the poor change their diets most in response to fiscal incentives). Targeting disadvantaged consumers with vouchers which can only be used for healthy foods is a new and promising intervention which will need to be evaluated—in particular there is an issue as to how much it increases consumption of healthy foods as opposed to displacing existing expenditure on those foods and enabling increased consumption of non-healthy foods and non-foods

## **2.2 Regulation of meals: school meals and workplace meals**

Among the group of “market measures” the regulation of catered meals (schools, workplaces, hospitals, etc.) is the most common, with 14 interventions within the EU which were selected in this survey. Almost all interventions (all but one) are at school-level and are strictly associated with education measures. These thirteen cases are evenly distributed between Nordic and Mediterranean countries. The popularity of school meal interventions can be explained by the level of public support for interventions aimed at child health. The only documented policy-driven intervention in the workplace in Europe (with the exception of a pilot component of the 6-a-day programme in Denmark) has been in Finland. Outside Europe, in Canada the “Eat Smart!” programme<sup>18</sup> has been found which certifies those workplace canteens which meet the required standards for healthy eating. Again, while this intervention can be classified as “meal regulation”, it provides a clear incentive to industries to promote their health orientation and support their brand image.

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<sup>16</sup> It is worth noting that the Polish milk programme combines the health benefits of milk in childhood with the support to milk farmers and is in fact funded by the Agricultural Market Agency and the Milk Promotion Fund. This is quite common also for the other milk programs active in Europe.

<sup>17</sup> Appropriate subsidises may compensate for this, see Smed et al. (2007).

<sup>18</sup> A similar intervention in Europe is the English Heartbeat Award Scheme.

A major recent trend in Europe concerns the regulation of vending machines in schools and public places, which constitute a relevant business activity. A ban of vending machines in schools is now in place in the UK and France, while in Italy a project consisting of providing fresh fruit and healthy foods through vending machines in school has started at regional level.

Another common intervention (often associated with nationwide fruit promotion campaigns) is the provision of free fruit at school, with surveyed interventions in the UK, France, Denmark, Norway, Italy and France. Other types of action include the provision of nutrition guidelines for school meals.

Outside Europe, since 2003, most US states have enacted regulations concerning vending machines in school while in Japan school meals have been subject to food standards since 1954, with strict limits on fats and a ban on vending machine.

Most of this actions have been evaluated in terms of effects on people's behaviour (Belgian "Tutti frutti program" making use of a control group had a positive impact on general fruit consumption by students, Italian "Aware break: nutrivending" has caused an increase in healthy snacks consumption in school of 21%, UK "Fuel zone" increased the healthy food intake among children, etc.).

### **2.3 *Nutrition-related standards***

The imposition of mandatory food standards on nutrients other than those regulated by food safety law has not yet been considered in Europe, except for Denmark where a ban on trans fat took effect on 1st January 2004 making it illegal for any food to contain more than 2 percent trans fats. This type of regulation has heavy financial implications for the private sector and major implications in terms of monitoring costs and international trade, besides major difficulties in adapting the standards to the different products and their use. The impact on consumption is unknown: a single country like Denmark can regulate the quality of its home-produced food, but not of imports from other EU countries. Substitution opportunities are also unknown—if eliminating trans-fats is expensive and raises the cost of specific foods, consumers may switch to cheaper alternatives—what these are and their health properties would need investigation.

There are several voluntary schemes encouraging the food industry to reformulate their products to meet healthier standards, but these are discussed separately in the following section.

### **2.4 *Government action to encourage private sector action***

The role played by the private sector in addressing unhealthy eating behaviour has been widely acknowledged, and the participatory approach to developing effective nutrition policies is the priority route in the European Union and in most countries.

Apart from the EU Platform for Action on Diet, Health, and Physical Activity<sup>19</sup> involving 33 organisations ranging from food industry to consumer associations, the survey recorded 10 actions

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<sup>19</sup> [http://ec.europa.eu/health/ph\\_determinants/life\\_style/nutrition/platform/platform\\_en.htm](http://ec.europa.eu/health/ph_determinants/life_style/nutrition/platform/platform_en.htm)

aimed at developing voluntary schemes and private-public partnership (9 of them in Europe and 5 of them in Spain). Product reformulation is probably the private sector action which might bring the most relevant benefits (a major example is the reduction of the salt content in processed foods) and which can be hardly governed by a regulation.

### ***2.5 Availability measures for disadvantaged consumers***

Availability measures for specific population sub-groups refer to those interventions which aim at addressing obstacles to access healthy foods in disadvantaged areas, for low-income consumers or for consumers facing difficulties (e.g. mobility) in accessing points of purchase with larger availability or affordable healthy foods. This refers mainly to fruit and vegetables in disadvantaged areas where access to supermarkets is poor, especially for those without cars, and where fruit and vegetable quality, variety and price in small neighbourhood shops make them unattractive.

While availability issues have been emphasised in the US, the issue seems less relevant in Europe. Two social care programs for economically and socially disadvantaged consumer have been identified in this survey in Scotland (now extended to parts of England) and Denmark. Evaluation is premature. A major issue is whether there is latent demand for the products or if lack of availability is caused by a lack of demand.

### ***2.6 Liability laws***

Liability laws are those which ascribe the responsibility for adverse health outcomes of consuming a product to the producers, the most notable case being the recent lawsuits against tobacco companies which have been found responsible to withhold relevant information on smoke-related diseases. The legal liability approach to allocate financial responsibility between producers and consumers is common in the US system, although obesity cases against fast food companies have been dismissed and a recent bill forbids similar lawsuits against food producers (which followed the *Pelman v. McDonald's*). This model of dealing with “product failure” is not transferable to the EU system, which is ruled by the precautionary principle where a regulatory approach is followed.

### ***2.7 Policy interventions not explicitly targeted at healthy eating but relevant***

Under this heading we have classified those interventions (mainly related to farm policy or VAT regimes) which are not explicitly developed to influence the healthiness of diets, but that may have a major role as they do alter relative prices or food supply.

The effects of the Common Agricultural Policy (CAP) on dietary quality are largely through their impact on prices. Although the impact on consumers depends on the transmission rate of farm to retail prices, it is generally accepted that bias has been (accidentally) in the direction of healthy eating since prices of red meat, dairy products and sugar have been increased more than prices of white meat and fruit and vegetables. Other aspects of the CAP such as subsidised butter disposal likely have adverse implications for levels of saturated fat consumption.

Discrepancies in VAT rates between healthy and unhealthy products are likely to have an effect on healthy eating and two examples of relevant policies are VAT rates set in Poland and the UK, where the differentiation of the VAT rate is broadly related to the health level of the food product. However, it is widely believed that differences in VAT rates are insufficient to cause major switches to healthy eating.

## 2.8 *Generic policies*

Some broad-scope interventions towards healthy eating not classified under other headings or with multiple measures have been considered in the generic category. This is the case for the English “Healthy Towns’ programme”, the Portuguese “Platform against obesity”, the “Strategy for Nutrition, Physical Activity and the Prevention of Obesity”, the German “Platform for Diet and Physical Activity”.

Among generic policies the Finnish North Karelia project has to be mentioned, as probably the most well-known example of “community-based” action with involvement of government and the private sector. Assessment of impact on *behaviour* has shown that butter consumption fell from 90% in the 70’s to 5% by 2000, while the use of vegetable oils increased from zero to reach 50% of the population. Fruit and vegetable consumption has increased and salt intake diminished. Furthermore, with regard to effects on *health*, dietary changes caused remarkable reduction in blood cholesterol and blood pressure and 80% reduction in the yearly CVD mortality rate and about 10 years increase in life expectancy. However, similar changes have been observed in a number of other countries over this same period, so it is not strictly possible to attribute the benefits to the North Karelia project.

### **Selection of cases studies**

The final step of WP1 is the selection of country or cross-country cases where there are gaps in evaluation, and where suitable data are available to enable further analysis and in particular *econometric* evaluation to be performed in WP2. In other words, WP2 is aimed to apply mainly *econometric* techniques on *large-scale, nationally representative secondary* data to estimate the impact of policies. This can be contrasted with the predominant approach in the public health literature on policy evaluation, involving *primary, typically smaller scale, purposively collected* data.

The selection of case studies is intended to represent a diversity of policy types. We also had the objective of attaining a reasonable spread of EU countries represented in the case studies. Starting with these constraints, we considered the intersection between policies, available data and methods. The following case studies have been chosen for WP2. Some of these case studies (Task 3 of WP2) will be evaluated in terms of consumption and health outcomes, while for others the evaluation will be limited to attitudes, awareness and behavioural intentions (Task 2 of WP2). Where possible, cost-effectiveness of alternative strategies will be derived (Task 4 of WP2). The list at this stage is still preliminary and may change if unforeseen data or methodological problems arise.

## 3. Group 1 – Evaluation of consumption/health outcomes

### *3.1 Food Standards Agency’s Salt Campaign, UK*

The Food Standards Agency in the UK launched its salt campaign in September 2004. The main policy tools of the campaign were increasing awareness via social marketing, and working with industry to encourage reformulation of products.

*Data and methods proposed for evaluation:* Spot urinary sodium levels have been measured by the Health Survey for England (HSE) since 2003.<sup>20</sup> Our proposal is to use the HSE individual data from 2003 onwards to econometrically estimate the determinants of urinary sodium measurements. Data are available for two years before the intervention (2003 and 2004) and several years of data are available post-intervention. Our proposal is to estimate regression models that express urinary sodium levels as functions of various socio-economic and demographic characteristics as well relative food prices. Having estimated models using pre-policy data (2003 and 2004), we would forecast future urinary sodium levels for post-intervention periods (*eg.* 2005) based on prices and socio-economic/demographic values from the post-intervention period. Then, the difference between the urinary sodium levels forecast by the model and the actual levels prevailing will provide an estimate of the effect of policy intervention.

Instead of using individual data, we may decide to form ‘pseudo-panels’ wherein we aggregate individuals into groups (*eg.* individuals from a certain gender, geographical region and age-category would be aggregated into one group). Aggregation into such groups mimics ‘panel’ or longitudinal data in that observations are available for the same set of groups over several points in time. In addition, since food prices are not available within the HSE, we propose grafting price information derived from the Expenditure and Food Survey for the relevant years into the HSE. Relative prices (of salty versus non-salty foods) can be derived on a geographical basis using the EFS, and matched to the corresponding data points in the HSE.

In addition to urinary sodium analysis, the HSE since 2003 has been reporting ordinal responses to questions about salt added by individuals to cooking and salt used at the table (always/sometimes/never, *etc.*). Modelling the extent to which these trends have changed post salt-campaign will provide insight on demand-side behaviour, complementing urinary sodium modelling, which provides insight into a combination of demand-side and supply-side (reformulation) factors.

### 3.2 Healthy Start Vouchers, UK

The Healthy Start vouchers scheme, essentially a healthy food subsidy scheme for low income families, was launched in November 2006. Healthy start targets the nutrition of pregnant women and families with small children, and provides vouchers of up to £3.10 per week that can be exchanged for fruit, vegetable, milk and infant formula. Those enrolled are also provided information about good nutrition and lifestyles.

*Data and methods proposed for evaluation* The National Diet and Nutrition Survey (NDNS) in the UK is now scheduled to be conducted on a rolling, yearly basis. A round of data under the new rolling scheme has already been collected for 2008-09 and is expected to be available to the public in summer 2010. The new NDNS includes a question for pregnant mothers and those with young children asking them about their use of Healthy Start vouchers, which provides an entry point into evaluation of the scheme. We propose to compare the nutritional intakes of young children whose families use healthy start vouchers with those whose families are eligible, but do not use the

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<sup>20</sup> It is well known that spot urinary sodium measurement is prone to error due to substantial variation of urinary sodium levels of individuals within a day. However, a study by the Health Survey of England and another by the Joint Health Surveys Unit in Scotland investigating this issue find that spot urinary sodium levels do correlate significantly with 24-hour measurements, and that ‘spot urine samples may be used to monitor trends in dietary sodium and to compare subgroups of the population, even if they do not exactly replicate the electrolyte levels of 24-hour samples’

vouchers.

The problem of assigning families into voucher users (treatment group) and non-users (control group)<sup>21</sup> might be faced by a number of econometric techniques (propensity score matching, regression control, Heckman correction, etc.).

### *3.3 Heart Symbol Nutrition Labelling , Finland*

Finland introduced a new healthy food labelling system in 2000, in which products bearing the ‘heart’ symbol would indicate that their nutrient profiles passed criteria set by the Finnish Heart Agency and the Finnish Diabetes Agency. Currently there are in excess of 370 products bearing the symbol in the Finnish market. Recent research shows that over 76% of Finnish adult population recognises the symbol. The effect of symbol introduction on population-wide dietary choices remains an open question, however.

*Data and methods proposed for evaluation:* FINDIET, the main Finnish large-scale dietary intake survey, collects information only once every five years. This substantial discontinuity in data collection makes the estimation of policy effects on nutrient intakes difficult.

We propose instead to use the Finnish annual survey of health behaviour to examine the impact of heart symbol introduction on changes in choices between food versions (*eg.* full vs low-fat cheese, fried vs boiled potatoes, *etc.*). The objective of the econometric analysis would simply be to test if the introduction of the heart symbol has led to a significant shift in terms of healthier choices being preferred over less-healthy alternatives, once changes in prices, time trends and other influencing variables are accounted for. The analysis would be cast in terms of a dietary quality choice theoretical framework, and estimation would involve limited dependent variable techniques.

### *3.4 Vending machine restrictions in schools (Suppression des distributeurs automatiques dans les ecoles), France*

A law passed in late 2004 in France introduced a ban on vending machines for drink and food in all schools (primary and secondary schools and colleges) from September 2005. Arguments raised against it noted that students would simply get their snacks from outside the school, and that no research existed demonstrating a link between vending machine use in schools and child obesity.

*Data and methods proposed for evaluation:* We propose to evaluate this policy via regression models explaining school-going child nutritional outcomes (*eg.* fat density of diets; sugar intake) and/or child BMI as a function of several control variable. Having estimated models using pre-policy data, we would forecast future nutritional outcome levels for post-intervention periods (*eg.* 2006) based on prices and socio-economic/demographic values from the post-intervention period. Then, the difference between the nutritional outcomes forecast by the model and the actual levels prevailing will provide an estimate of the effect of policy intervention. The data used will be the INCA food consumption survey on individuals carried out by CREDOC, with the sample restricted to children of school-going age.

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<sup>21</sup> Selection is not random, *i.e.* families self-select themselves into such groups. Simply regressing nutrient intakes on voucher use can then produce biased and misleading results.

### *3.5 Impact of large-scale campaigns promoting F&V consumption in three countries*

A detailed literature review of ex-post impact assessment studies for policies promoting fruit and vegetable consumption in Europe and US has shown that the average effect on consumption is roughly between +0.2 and +0.6 portion per day (Pomerleau et al., 2005). This case study will compare the impact of campaigns to promote F&V vegetables consumption in various countries, based on household budget surveys and health surveys. The case study will include an evaluation of the 5-a-day campaign in the UK, an evaluation of 6-a-day in Denmark, and an evaluation of 5-a-day in Spain.

*Data and methods proposed for evaluation:* Evaluation will be based on difference-in-difference model-based estimators. Based on household budget surveys (possibly restructured into panel data) from the three countries, we will estimate purchasing behaviours conditional to prices and income prior to the intervention. Post-intervention consumption will be projected using the pre-intervention model and post-intervention prices and incomes to derive a counterfactual estimate of consumption in absence of intervention. Data from health surveys will be used to integrate HBS data where possible/useful. Any significant consumption impact will be then translated into potential (projected) health outcomes.

### *3.6 Reformulation to remove 'harmful' nutrients from food: proposed qualitative case study based on various countries*

Reformulation of foods to remove harmful ingredients may follow mandatory regulation, coercion of food manufacturers by regulators or voluntarily by manufacturers wishing to promote sales of their products. Mandatory regulation is rare, Denmark's banning of all but trace-levels of trans fats from food in 2003 being a rare example. Coercion is much more common; for example in the UK the Food Standards Agency has been 'persuading' manufacturers to remove salt and saturated fatty acids from processed foods. There is considerable disagreement over the costs of reformulating. Again, based on UK experience, manufacturers claim the FSA seriously underestimates costs in cost-benefit type studies. FSA estimated the cost of reducing sat fats in meat products at £1000 to £3000 per product whereas industry claim the cost for packaging alone would be greater than this, and citing the cost to United Biscuits of £6m (and taking 3 years) for reformulating 3 biscuit lines and for Mars a cost of £9m (over 5 years) for reformulating its chocolate products (The Grocer 5 Dec 2009; 16 Jan 2010). The FSA claims much of this reformulation would be undertaken by firms for purely commercial reasons and therefore shouldn't be included in any social cost-benefit study.

A set of interesting research questions follows:

- What are the various costs to industry of reformulation? (research, ingredients, packaging....)
- What factors determine the cost (functional importance of the ingredient and its impact on taste)?
- What are the impacts of firm size on unit reformulation costs (SMEs, global firms)?
- What are the views of industry on compulsory standards vs voluntary reformulation?
- Are there first mover advantages?
- Are there any harmful effects e.g. on international competitiveness?
- What are the costs (through higher prices) and benefits (health) to consumers?
- Are there general lessons to be learned?

*Data and methods proposed for evaluation:* Based on in-depth semi-structured interviews with manufacturers (e.g. Mars, Kraft, UB) and their representatives (e.g. CIAA, FDF), with national and EU regulators and with consumer and other stakeholders in the UK, Denmark (and Poland?).

#### 4. Group 2– Evaluation of impact on attitudes. knowledge, values, social norms, efficacy and behavioural intentions (WP2 – Task 2)

##### *4.1 Fish affects all and everything, Poland*

The public information campaign "***Fish affects all and everything***", was launched in Poland in order to promote fish consumption. It used mass media (TV spots), and claims to have induced higher fish consumption in Poland.

*Data and methods proposed for evaluation:* SeaFoodPlus<sup>22</sup> carried out two cross-sectional online consumer surveys in 2004 and 2008. Questionnaire included socio-demographic information and attitudinal data. Self-reported heights and weights were registered which allows to classify respondents according to their nutritional status. Data allows hence evaluating changes (or lack thereof) in general attitudes, subjective health and nutritional status.

Analysis can be done applying General Linear Model (Regressions) to compare attitudinal scales scores at population level, controlling for the effects of socio-demographic characteristics and mutually adjusting for other attitudes. Selected scales will be introduced in the model as continuous dependant variables, while socio-demographics and nutrition status as independent variables. Furthermore, for the study of extremes, selected scales could be further dichotomized for logistic regression analysis. Although time effects cannot be estimated with two points in time, it is still possible to describe changes occurred between the two measurements.

##### *4.2 Five-a-day campaign 2004-2007, Spain*

The public information campaign "***Five-a-day***" aimed at promoting fruit and vegetables consumption in Spain. Outcomes of this evaluation will be associated with results from the case studies on campaigns promoting F&V consumption.

*Data and methods proposed for evaluation:* Same as previous, SeaFoodPlus cross-sectional online datasets with the two waves in Spain. Similar to the Polish study, analysis can be done applying regression methods to compare attitudinal scales scores at population level, controlling for the effects of socio-demographic characteristics and mutually adjusting for other attitudes. A nominal variable will be created to account for the year of survey (a dummy for a pseudo time effect). Selected attitudinal scales will be introduced in the model as continuous dependant variables, while socio-demographics, nutrition status and survey year as independent variables. Furthermore, for the study of extreme cases, the scales of interest could be further dichotomized for logistic regression analysis.

##### *4.3 Platform on Diet and Physical Activity, Germany*

The Platform Diet and Physical Activity (peb) combines a variety of social forces that are active for balanced nutrition, exercise and relaxation involved as key ingredients for healthy lifestyle of children and adolescents.

*Data and methods proposed for evaluation:* The German Nutrition Survey is carried out regularly by the Department of Nutritional Behaviour at the Max Rubner Institute. Repeated surveys analysis, age, cohort and time effects could be controlled for. For contrasting extremes, attitudinal variables of interest could be dichotomized and included in binary logistic models as high vs. low scores. This procedure will allow to mutually adjust for the effects of socio-demographics and anthropometrics on attitudes.

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<sup>22</sup> The first wave was carried out in Nov-Dec 2004 in Belgium, Denmark, the Netherlands, Poland and Spain; whereas the second wave in May 2008 in France, Poland and Spain.

# Appendix 1

## Mapping of past interventions



Grant agreement no.: 226713

## **Work Package 1**

Benchmarking nutrition policies in Europe, their evaluation and identification of successes and failures

### **Mapping of past interventions**

**Input to deliverable D1.1  
Milestone 1.2**

**Internal report**

Date due: Month 9  
First draft delivered: Month 9  
Revision finalised: Month 12

Main responsibility for this document: UNIBO  
with input from AU, UGENT, UREAD, INRAN, JUMC, KRAFT and EUFIC

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## Report: Mapping of policy interventions

### Abstract

**Objectives:** Identify policy interventions in European Member States and elsewhere that may have affected healthy eating, including policies based on objectives other than healthy eating outcomes.

**Design:** We define *healthy eating* as the adherence to the nutrition recommendations of the World Health Organisation (WHO) and by *policy intervention* we refer to any government action which can affect people's healthy eating behaviour by (a) supporting more informed choice; (b) changing the market environment. A list of 16 policy intervention types to promote healthy eating consistent with these definitions is provided. Based on this list, we select relevant interventions using the following procedure: (1) perform an exhaustive search on selected EU countries; (2) integrate the mapping of interventions with a further search on all EU countries not included in the above list and non-EU countries in order to generate an exhaustive mapping in terms policy types (i.e. at least one case for each policy type); (3) we integrate the mapping considering previous reviews, such as the WHO database of policy measures, OECD reviews, HOPE project results, EuroHealthNet. For each policy intervention, we have recorded the name of the intervention, the geographical scope, a short description, timing and duration of the intervention, the expected and potential health or behavioural outcomes, any information on evaluation and/or perceived success.

**Setting:** the survey was first based on documented policy actions in the following European countries: Belgium, Germany, Denmark, Spain, Finland, France, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Sweden, United Kingdom, then extended to relevant interventions in other countries, where this was necessary to achieve an exhaustive mapping by policy intervention type.

**Results:** 127 policy interventions were selected for inclusion in the survey, 119 of them in European countries. Considering EU countries only, 80 policy actions are classified in category "(a) supporting more informed choice" and 29 in the "changing the market environment" category. Public information campaign and education measures are by far the most common type of action (73 interventions). Within the policies that operate at the market level, these mainly concern regulating school environments (13 out of 29) and government actions targeted at prompting private sector response (10 out of 29), mainly through public-private agreements. While information campaign and education measures are by far the most exploited policy actions, no clear evidence exists that a more informed choice and better knowledge translate into healthier behaviour. There's a growing emphasis on controls at the catering level, especially for school meals and vending machines in schools. Among intervention on vending machines, other than a complete ban, the introduction of fresh and healthy products has been shown to be potentially effective in some pilot projects. While "fat taxes" are now being considered in some European countries, they are unlikely to make a substantial difference in terms of consumption, but they might generate high tax revenues which could in principle be ring-fenced to fund other healthy eating measures. Other than developing new fiscal policies, action to adjust relative VAT rates for different types of foods, may also act as incentives towards a healthier diet. In Europe there's a successful history of co-operation between the public and private sectors to avoid an excess of regulations which may bring unnecessary burden to firms and public authorities. In several countries agreements have been reached to lead to product reformulation, in particular with regard to the reduction of salt content.

## 1. Introduction

The general aim of this report is to provide a survey of relevant policy interventions aimed at healthy eating, with the following specific objectives:

- i) Provide an up-to-date picture of the policy options currently implemented in Europe
- j) Integrate the above mapping with the most prominent policy experiences outside Europe, with a special focus on instruments not yet adopted in Europe
- k) Collect any information on existing ex-post evaluations of the effectiveness of these policy actions
- l) Explore the feasibility of additional indirect ex-post evaluations based on the availability of appropriate secondary data

Given the multiplicity of small-scale interventions and the variety of actions which may affect people's diets, we adopt two definitions to confine the scope of our survey. First, we consider as *healthy eating* the adherence to the nutrition recommendations of the World Health Organisation (WHO). Second, by *policy intervention* we refer to any government action which can affect people's healthy eating behaviour by (a) supporting more informed choice; (b) changing the market environment. While government interventions are not necessarily limited to the national-level, but may include support to policies that are regional or city-level in scope (often scalable to a higher level), this definition rules out micro-level actions promoted by other public or private bodies. We also exclude broad policy documents (e.g. white papers) who are not associated to specific actions which can be included in the above definition. Finally, some policies may be articulated in several interventions, in which case they are listed as separate policy actions, although the reference to the broader policy umbrella will be provided.

The above definitions generates the list of policy actions to be considered in the survey shown in Table 1, which extends the list provided in Mazzocchi, Traill and Shogren (2009).

**Table 1. Classification of healthy eating policy actions**

<b>Supporting more informed choice</b>
Advertising controls - <i>On advertising to children</i> - <i>On general advertising</i> Public information campaigns (e.g. to promote healthy eating, e.g. fruit and vegetable consumption, reduce salt intake) Nutrition education - <i>For children at school</i> - <i>For adults (e.g. at workplace)</i> Nutritional labelling Nutritional information on menus
<b>Policies aimed at changing the market environment</b>
Fiscal measures - <i>Tax/subsidies on foods to the population at large</i> - <i>Subsidies (e.g. vouchers) to disadvantaged consumers</i> Regulate meals - <i>School meals (including vending machine bans and provision of free fruit and vegetables)</i> - <i>Workplace meals</i> Nutrition-related standards (e.g. limits on unhealthy nutrient content for certain foods, portion sizes, etc.) Government action to encourage private sector action without formal regulation (e.g. reformulation to reduce unhealthy nutrients in processed foods) Availability measures for disadvantaged consumers (e.g. UK DOH promote availability of f&v in disadvantaged areas) Liability laws Policy interventions not explicitly targeted at healthy eating but relevant (e.g. VAT rates, agricultural policy, etc.)

Source: adapted from Mazzocchi, Traill and Shogren (2009)

**Table 2. Selected interventions**

Policy classification	Total	EU	Country																		
			AU	BE	DE	DK	ES	FI	FR	IE	IE & NI	IT	NO	PL	PT	SE	UK	CA	JP	US	
<b>Supporting more informed choice</b>	<b>84</b>	<b>80</b>	1	3		7	4	2	5	2		1	21	2	10	8	3	11	2	2	
<b>Advertising controls</b>	<b>4</b>	<b>3</b>							1	1								1	1		
<i>On advertising to children</i>	3	2								1								1	1		
<i>On general advertising</i>	1	1							1												
<b>Public information campaigns</b>	<b>39</b>	<b>38</b>	1	3		4	2	1	2	1		1	8	1	2	2	2	8	1		
<b>Nutrition education</b>	<b>35</b>	<b>35</b>				3	2		2				13	1	7	6		1			
<i>For children at school</i>	31	31				3	2		2				12	1	5	5		1			
<i>For adults / generic public (e.g. at Workplace)</i>	4	4											1		2	1					
<b>Nutritional labelling</b>	<b>5</b>	<b>4</b>						1							1		1	1		1	
<b>Nutritional information on menus</b>	<b>1</b>	<b>0</b>																		1	
<b>Changing the market environment</b>	<b>33</b>	<b>29</b>		1		4	6	1	3				4	2	3	1	1	3	1	1	2
<b>Fiscal Measures</b>	<b>4</b>	<b>3</b>													2			1		1	
<i>Tax/subsidies on foods to the population at large</i>	1	0																		1	
<i>Subsidies to disadvantaged consumers</i>	3	3													2			1			
<b>Regulate meals</b>	<b>15</b>	<b>14</b>		1		2			3				4	2				1	1	1	
<i>School meals</i>	13	13		1		1			3				4	2				1	1		
<i>Workplace canteen meals</i>	2	1				1														1	
<b>Nutrition-related standards</b>	<b>1</b>	<b>1</b>				1															
<b>Government action to encourage private sector action</b>	<b>10</b>	<b>9</b>				1	6	1							1					1	
<b>Availability measures for disadvantaged consumers</b>	<b>2</b>	<b>2</b>				1													1		
<b>Liability laws</b>	<b>1</b>	<b>0</b>																		1	
<b>Not explicitly targeted at healthy eating</b>	<b>4</b>	<b>4</b>													3				1		
<b>Generic</b>	<b>6</b>	<b>6</b>			1	1	1		1							1		1			
<b>TOTAL</b>	<b>127</b>	<b>119</b>	1	4	1	12	11	3	9	2		1	25	4	16	10	4	16	3	1	4

The survey has been developed in various stages. In the first stage, an exhaustive search for documented policy actions has been conducted on the following European countries: Belgium, Germany, Denmark, Spain, Finland, France, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Sweden, United Kingdom. For each policy intervention, we have recorded the name of the intervention, the geographical scope, a short description, timing and duration of the intervention, the expected and potential health or behavioural outcomes, any information on evaluation and/or perceived success. Once this step has been completed, the list has been polished to ensure consistency with the adopted definitions. Then, following the classification of interventions shown in Table 1<sup>23</sup>, a further search on all EU countries not included in the above list and non-EU countries has been conducted with the main objective of providing an exhaustive mapping in terms of policy classification, while the survey cannot be considered exhaustive in terms of geographical coverage. Finally, the mapping has been integrated through direct consultation with policy makers and local public servants in the selected countries and considering previous reviews, such as the WHO database of policy measures, OECD reviews, HOPE project results, EuroHealthNet results.

The report is structured as follows. The next section provides a summary description of the interventions included in the mapping. Section 3 reviews each type of policy intervention, providing references to existing or potential evaluations and where possible an assessment of the evidence on its policy effectiveness. Some conclusions are drawn in section 4.

## **2. Summary results of the mapping**

Following the criteria and the procedure described in Section 1, the survey resulted in 127 policy interventions (119 in Europe) selected for the mapping. Table 2 shows the distribution of the interventions by policy action typology and country, while the complete list of interventions is in the Appendix.

By no means the distribution by country reflects the level of public intervention in the nutrition arena, as – depending on the national health systems – policy actions may be co-ordinated at the national level (e.g. Department of Health in England) or regional level (e.g. the Italian health system is structured into regional Health Departments). Furthermore, the definition of policy interventions allows to break down interventions with a large scope (e.g. 5-a-day) into several actions within the same policy (information actions, school meals, education actions, etc.). In general, consolidated and systematic healthy eating policy actions other than information campaigns examples in Europe are confined to few cases in Scandinavian Countries and the UK, with France as a newcomer. Instead, Mediterranean countries and other countries considered in this survey have only a recent history of policy actions and mostly confined to information and education measures.

The bias towards less controversial information and education actions compared to market-level interventions which usually generate direct costs for economic agents is clear from the distribution between policies supporting “more informed choices” and those aimed at changing the market environment. In our survey, considering EU countries only, 80 policy actions are classified in the first category and only 29 in the latter. Public information campaign and education measures are by far the most common type of action (73 interventions), as even within the information support policies there seems to be less inclination towards policies affecting market behaviours, like advertising controls (3 cases listed in Europe) or labelling regulations (4 cases, although the EU implements a EU-wide policy for health claims). Similarly, within the policies that operate at the market level, these mainly concern regulating school environments (13 out of 29) and government actions targeted at prompting private sector response (10 out of 29), mainly through public-private agreements.

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<sup>23</sup> For each policy action, a main classification and – where necessary – a secondary classification into one of the policy typologies of table 1 were chosen.

For a few policies we were unable to find measures in Europe. These are fiscal measures for the population at large and liability laws. While the former are now being considered in some countries and are the subject of a growing policy and academic debate, liability laws are unlikely to be a realistic instrument given the European law system.

### **3. Supporting more informed choice**

#### *3.1 Advertising controls*

Under this heading, the survey focused on advertising controls explicitly targeted to healthy eating, although general laws have been in place for many years in several countries to restrict – for example – advertising to children, but not limited to food. While advertising bans and regulations for children-targeted foods are often considered as a viable option, much less emphasis is given to restrictions to advertising to the broader audience. This is easily explained by the major economic implications for the food and advertising industry, and to the debatable policy rationale even under an economic perspective, since advertising cannot be seen as a source of market failure except in the case it creates a market barrier and adults are seen as rational economic agents which can freely use the advertising information to make their welfare-optimising choices. In the US, political decisions limited the adoption of advertising control because of conflicts with the First Amendment (freedom of speech)<sup>24</sup>.

Within the survey, only 4 cases of advertising control were selected, one of which outside Europe, the Quebec ban on advertising to children under 13 which dates back to 1980<sup>25</sup>. The Quebec ban is especially interesting, because it has been in place for a long time during the decades of the “obesity epidemics” in North America, but especially because it constitutes an ideal natural experiment for testing the policy effects, as the neighbouring province of Ontario has not been subject to similar restrictions. By matching similar individuals between the two regions and adopting a difference-in-difference approach (i.e. how the difference between matched samples changes over time), Baylis and Dhar (2007) estimate a magnitude of the policy impact ranging from a decrease of 11 to 22 million fast food meals per year due to the ban. This amount translates into 8.9 to 23 billion calories, and the authors show some persistence of the effect as young children grow into adulthood.

All over Europe advertising regulations are common in reference to minors and regardless the kind of product that is promoted. For example many restrictions on the timing and the content of television advertising to children exist. Also with regard to the food area advertising regulation is mainly meant to protect minors. Special rules on food advertising to children exist in the UK, Belgium, France, Denmark, Finland, Ireland, Portugal, Netherlands and Spain. Most of them are laws, some of them (like the Spanish and the Portuguese ones) are “self-regulatory codes”, although companies adhering to the voluntary code may still be subject to fines in case of violation, like in Spain. The effects of British Ofcom (formerly Independent Television Commission) Advertising Standards code on children have been evaluated, mostly in terms of children’s exposure to advert messages on TV<sup>26</sup>. A similar ban has been introduced in 2008 in Ireland.

The recent French law on food advertising (regardless of age) is an example of generic advertising control and provides that each food advertisement has either to be followed by public health messages or companies are subject to a 1.5% tax on their overall food advertising budget. A survey

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<sup>24</sup> See Mazzocchi, Traill and Shogren (2009, p. 125) and references therein

<sup>25</sup> See Baylis & Dahr (2007), <http://www.aae.wisc.edu/events/papers/AppEcon/2007/baylis.11.07.pdf>.

<sup>26</sup> See <http://www.ofcom.org.uk/media/speeches/2008/12/hfssslides.pdf>

conducted in October 2007 by the National Institute of Prevention and Health Education has been used to assess the understanding of the messages, their impact and their incentive to change behaviour. This evaluation – which however has been questionably based on questionnaire with self-reported behaviours – concluded that 21% of individuals above 15 have changed their eating habits and 17% their food purchasing habits in response to the health messages included in the food advert<sup>27</sup>.

### 3.2 *Public information campaigns*

Public information campaigns are intended here as interventions which exploit media communication and other social marketing tools to improve individual and social knowledge about health issues connected to food habits, and directed to any kind of target population. It is by far the most common healthy eating policy, together with education interventions.

Information measures are often an accompanying measure for other types of intervention, but in the present survey 39 information campaigns (38 in Europe) have been selected where the information action was the core objective of the policy, and only in 4 cases a secondary classification was adopted to reflect other types of actions within the same policy umbrella. This type of policy exists in all countries included in the survey, and for those countries like Italy where policy initiatives are at a regional level, most regions implement their own information campaign.

Information policies specifically developed to address rising obesity rates are common (for example the British Change4Life) and widespread information actions are also planned within generic policy frameworks like those of the Portuguese Platform Against Obesity or the German Platform for Diet and Physical Activity. In other cases, healthy eating messages are provided in association with specific health risks like cancer, heart diseases or diabetes (as in the British “Take life on, one step at a time”, the Finnish North Karelia project, or the French National program to reduce cardiovascular risk). The target may also be a specific food issue, and there’s an increasing number of communication campaigns to reduce salt intakes (the UK salt campaign by the Food Standard Agency or the Italian “Salt in Food”), but the most widespread action is the one emphasising the need to reach the target intake of fruit and vegetables, generally based on the “5 portion a day” message (as the UK “5 a day”), but sometimes articulated differently (“6-a-day” in Denmark or the East Finland Berry and Vegetable project). Public policies to promote fruit and vegetable consumption exist in most European countries (see the Appendix), although in some countries (e.g. Portugal and Spain) they are primarily targeted at schoolchildren and implemented as education interventions. In Poland and Denmark there are also information campaigns to encourage fish consumption, although these are primarily supported by Agriculture and Fishery authorities or the Fishery industry and the health objective is integrated with a generic product advertising objective.

While nationwide information campaigns have been widely evaluated through ad-hoc survey or relying on secondary consumption or expenditure data, there is no strong evidence about their effectiveness in terms of changing actual behaviour. Most official evaluations report increases in knowledge and awareness, but there’s scarce evidence of positive outcomes in terms of changing intakes or health markers like body mass, cholesterol or blood pressure.

Low effectiveness of traditional media campaigns may be easily explained by the low budgets compared to the large investments usually involved in product advertising, but they also depend on the originality of the message, and innovative social marketing tools (possibly based on private sector best practices) may produce better outcomes. Some examples are city-level interventions the Veggie Day in the city of Ghent (which “goes vegetarian” every Thursday), the loyalty card system

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<sup>27</sup> <http://www.inpes.sante.fr/70000/dp/08/dp080204.pdf>

in Manchester (where points may be gained by improving lifestyles and spent into healthy products and services) or the “challenge” to lose weight in Liverpool.

### 3.3 *Nutrition education*

Nutrition education measures are strictly related to information campaign as they aim to change knowledge and information levels. To distinguish between information campaigns (intended as media communication and social marketing as defined in the previous section) and education measures, the following actions are included under the education heading:

- Any policy action which deals directly with schools (i.e. involving pupils, teachers, or school officers)
- Any policy action which exploits tools that are typical of education: training, seminars, lectures, etc.. regardless of the age of the target subjects.

School-level or workplace interventions which affect meals (e.g. the provision of free fruit) are not included under this heading and are discussed in a separate section.

Considering this classification, 35 nutrition education interventions were included in the survey, 31 of them targeted at schoolchildren and only 4 directed at the society at large. Of these 35 interventions, 13 were selected in Italy, again due to the regional policy decision-making structure for health interventions. The school-level implementation also favours the local dimension and the enforcement in individual municipalities or regions. Some interesting evaluations which explore attitude and behavioural impact measurement exist, especially in Mediterranean countries which are suffering rising obesity rates, and even higher in childhood. The outcome of school-level interventions can be effectively monitored over time, but most of the interventions have a limited geographical scope and intensity which makes it difficult to generalise effectiveness finding. However, for some programmes running at a large-scale (for example the Portuguese project Zero Obesity and Health against Obesity, the Spanish Perseo program, the French Epode program) there's an explicit plan of monitoring BMI and lifestyle variables and the evaluations that will be produced in the forthcoming years might be very informative.

Education intervention targeted to the wider population outside schools are less frequent and less manageable, but some example exists in Portugal (“Community Weight Program” and “For Us”) and Italy (“Piedmont Obesity Project”). These interventions generally develop in the workplace with the co-operation of employers, thus they are often limited to public sector employees.

The first evaluations of the Piedmont Obesity Project, started in 2005 and targeted to overweight and obese adults (only 1,400 were involved out of more than 300,000 obese adults in the region), showed significant losses of excess weight, without regaining it (38% of participants), through support by diet and nutrition specialists and the family doctor. A particularly strict and original intervention outside Europe is the one promoted in Japan, where weight-loss programs are implemented in the workplace and companies face financial penalties if their collective workforce falls short of the targets within the allotted time.

### 3.4 *Nutritional labelling*

By ‘nutritional labelling intervention’ we mean any regulation covering general labelling on food (which foods have to carry nutritional information, what type of nutrition information should be reported, etc..). Labelling requirements can also be an accompanying feature of information campaigns, as is the case of the UK 5-a-day campaign with the development of a specific logo for those products which contribute to the target.

The debate over nutrition labels is quite active in Europe<sup>28</sup> where labelling is regulated through the Council Directive of 24 September 1990 on nutrition labelling for foodstuffs (90/496/EEC) which specifies the labelling format to be used when, according to national norms, nutrition information is

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<sup>28</sup> See the FLABEL EU project, [www.flabel.org](http://www.flabel.org)

to be included on the packaging of a food product. This original Directive has been followed by some subsequent acts regarding further norms for labelling and health claims<sup>29</sup>.

Only 4 relevant labelling acts were found in our survey. The most prominent one is certainly the ‘keyhole’ symbol adopted in Sweden in 1989 which has recently become a common label also in Norway and Denmark, while Finland has adopted since 2000 the heart symbol. The use of the keyhole and heart symbol labels is only allowed for products which meet some specific nutritional characteristics (e.g. less than 2 grams of trans-fatty acids, or given level of sodium and fats depending on the product) and is aimed at increasing consumer awareness, but also encourage food processors to reformulate products in order to be eligible. Most evaluations have shown awareness of the meaning of the symbol, although the actual influence of purchasing behaviours has not yet been quantified. The UK Food Standard Agency is currently encouraging on a voluntary basis the use of the so-called “traffic light” system for classifying foods in term of nutritional content, while Poland has a general regulation on food labelling which concerns food additives as well as nutrient contents. A long history of labelling regulation is also associated with the US Nutrition Labelling and Education Act (NLEA), introduced in 1990 and followed by labelling norms in 1993. There have been several economic evaluations of the costs and benefits of the NLEA and a positive balance was found especially with higher estimates of misleading claims prior to the introduction of the regulation.

### 3.5 Nutrition information on menus

While there are cases in Europe where the of nutritional information on menus in restaurants or canteens is part of wider information programs or labelling systems (this is the case of the Portuguese Platform against obesity, or the Swedish Keyhole), specific policy actions in this direction are not common in Europe. Some voluntary schemes or local initiatives<sup>30</sup> do lead to the provision of nutrition information, but no systematic intervention which fits with our definition of policy was found. Outside Europe, the regulation of nutrition information provided in menus is gaining increasing popularity in the US, to the point that the recent reform of the health system in 2010 includes a measure which requires restaurant chains (20 or more locations across the country) to display calorie content of foods in menus, menu boards, and any posters. State-level regulations which require mandatory nutrition information on menus have already been implemented for some years in various US states (see Appendix). The empirical evidence about the actual eating outcomes is weak<sup>31</sup>, although it is accepted that consumers often ignore the presence of unhealthy nutrients in menu items, so that this type of policy goes towards the promotion of informed choice and readdress an information asymmetry, regardless of the actual benefits in terms of healthy eating.

## 4. Policies aimed at changing the market environment

### 4.1 Fiscal measures

While there is an ongoing debate in Europe about the adoption of fiscal measure to improve eating habits and reduce the burden of nutrition-related diseases, no major fiscal measures have been adopted in the European Union. A recent exception is the Romanian announcement (January 2010) towards the adoption of a “fat tax”<sup>32</sup> on fast food, soft drinks and sweets, with the objective of

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<sup>29</sup> Regulation (EC) No 1925/2006 of the European Parliament and of the Council specifies cases in which nutrition labelling is compulsory. Regulation (EC) No 1924/2006 of the European Parliament and of the Council harmonises Member States’ provisions on the labelling of nutrition claims, including those relating to health.

<sup>30</sup> See for example the English Heartbeat Award (Holdsworth et al., 2004)

<sup>31</sup> See Mazzocchi, Traill and Shogren (2009, p. 130) and references therein

<sup>32</sup> Romanian Health Minister Attila Cseke to introduce ‘fat tax’ in battle against obesity, *Times on-line*, 16 January 2010, <http://www.timesonline.co.uk/tol/news/world/europe/article6990411.ece>

raising tax revenues for health programmes. The new tax was expected to be introduced on 1 March 2010, but its implementation has been delayed<sup>33</sup>. Funds raised will be paid into a state treasury account for the exclusive use of the Ministry of Health. This measure is not included in our survey, as only currently running measures were eligible, but it can be regarded the first national-level fiscal policy directed to the population at large in Europe, and would be probably the most far-reaching in the world.

Thus, the only fiscal intervention for the population at large selected in our survey is based on the US policy experience, where the so-called “twinkie-taxes” have been implemented in thirty states. These taxes are generally very small levies applied to foods and drinks of low nutritional values, especially sodas. The small size of these taxes, combined with rather inelastic demand, makes them quite ineffective in terms of readdressing behaviour, but allow to generate very large tax revenues which are often used to fund alternative health and nutrition interventions. There are estimates that the twinkie taxes generate every year about \$ 1 billion for the states’ coffers. Health-targeted price subsidies for the population at large are practically nonexistent, and price measures are mainly confined to agricultural support which is discussed in a separate section, with a strong push by the World Trade Organisation to reduce any form of price intervention.

More common is the institution of subsidies to support healthy eating of target groups and three cases were selected in our survey. In Poland, there’s a scheme to support children nutrition in disadvantaged families, as well as another scheme providing price-reduced (or even free) milk to all schoolchildren. This latter measure combines the health benefits of milk in childhood with the support to milk farmers and is in fact funded by the Agricultural Market Agency and the Milk Promotion Fund. Instead, the Healthy Start programme in the UK is explicitly targeted at improving nutrition habits for disadvantaged households, who receive free vouchers which can be swapped for healthy foods or free vitamins. The scheme is limited to disadvantaged families with children under 3 years old, and pregnant mothers. The scheme replaces the Welfare Food Scheme, which supported food consumption with volume-based vouchers.

The evaluation of the trade-offs (not least in terms of inequalities) of fiscal measure to encourage healthy eating are a top priority, as well as the balance of costs and benefits of taxes compared to subsidies (potentially for the population at large) to encourage dietary changes. So far, this has been mainly an academic exercise, but the growing interest of EU governments for this type of policy option (besides Romania, France has been considering a “fat tax” in recent years) emphasises the need for reliable assessments.

#### 4.2 *Regulate meals*

Among the group of “market measures” towards healthy eating, the regulation of catered meals (schools, workplaces, hospitals, etc.) is the most common, with 14 interventions within the EU which were selected in this survey. Almost all interventions (all but one) are at school-level and are strictly associated with education measures, but were included under this heading because they imply restrictions on school meals. These thirteen cases are evenly distributed between Nordic and Mediterranean countries. Instead, there are no documented policy-driven interventions at the workplace level, with the exception of a component of the 6-a-day programme in Denmark (but still at the piloting stage) and a trade-union driven experiment in Austria. A successful and relevant approach to improve workplace meals was found in Canada with the “Eat Smart!” programme<sup>34</sup>, which certifies those workplace canteens who meet the required standards for healthy eating and

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<sup>33</sup> How to solve the junk food problem: tax, *Independent on-line*, 3 April 2010, <http://www.independent.co.uk/life-style/health-and-families/health-news/how-to-solve-the-junk-food-problem-tax-1934716.html>

<sup>34</sup> A similar intervention in Europe is the English Heartbeat Award Scheme.

allow them to display a logo and provide further informative material. Again, while this intervention can be classified as “meal regulation”, it provides a clear incentive to industries to promote their health orientation and support their brand image.

The popularity of school meals interventions can be explained by the level of public support for interventions aimed at child health. A major recent trend in Europe concerns the regulation of vending machines in schools and public places, which constitute a relevant business activity. A ban of vending machines in schools is now in place in the UK and France, while the Italian “Nutrivending” project – consisting in providing fresh fruit and healthy foods through vending machines in school – started at regional level with public funding and the participation of vending machines businesses and organic farmers is currently being transferred to other regions and potentially scalable to the National level. Preliminary evaluation shows a significant increase in purchases of healthy foods in those schools which participated to the project. Another common intervention (often associated with nationwide fruit promotion campaigns) is the provision of free fruits at school, with surveyed interventions in the UK, France, Denmark, Norway, Italy and France. Other types of action include the provision of nutrition guidelines for canteens.

Outside Europe, in 2000 43% of the US elementary schools, 89.4% of middle/junior high and 98.2% of senior high schools had either a vending machine or a school store, canteen, or snack bar where students could purchase competitive foods or beverages. Since 2003, most US states have enacted regulations concerning vending machines in school. In Japan school meals have been subject to food standards since 1954, with strict limits on fats and a ban on vending machine. Japan has one of the lowest obesity rates among OECD countries.

#### *4.3 Nutrition-related standards*

The imposition of mandatory food standards on nutrients other than those regulated by food safety law has not yet been considered in Europe, except for Denmark where a ban on trans fat took effect on 1st January 2004 making it illegal for any food to contain more than 2 percent trans fats.

This type of regulation – as the wide experience of food standard laws has taught – has major implications in terms of monitoring costs and international trade, besides major difficulties in adapting the standards to the different products and their use. Nonetheless there are several voluntary schemes encouraging the food industry to reformulate their products to meet healthier standards, but these are discussed separately in the following section.

#### *4.4 Government action to encourage private sector action*

The role played by the private sector in addressing unhealthy eating behaviour has been widely acknowledged, and the participatory approach to developing effective nutrition policies is the priority route in the European Union and in most countries. There are a multitude of platforms and venues where public and private decision maker meet and discuss the potential of shared efforts to tackle the adverse consequences of unhealthy diets, with an inclination towards voluntary schemes and agreements which may avoid the regulatory option and some of the private and public policy costs (not least those associated with implementing and monitoring policy actions).

The most notable example of this type of action is the EU Platform for Action on Diet, Health, and Physical Activity<sup>35</sup>, which involves 33 organisations ranging from food industry to consumer

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<sup>35</sup> [http://ec.europa.eu/health/ph\\_determinants/life\\_style/nutrition/platform/platform\\_en.htm](http://ec.europa.eu/health/ph_determinants/life_style/nutrition/platform/platform_en.htm)

associations. To date, the Platform has generated 196 commitments to action<sup>36</sup>, which include – for example – the participation of large food industries to the EPODE programme (see Educational interventions), the creation of a Pan-European Logo for the promotion of fruits and vegetables consumption by the European Fresh Produce Association, private industry funding of TV programmes promoting healthier lifestyles, as well as the design of TV adverts by the European Association of Communication Agencies in collaboration with the European Food and Drink Federation, but also voluntary provision of nutrient information, product reformulation, and even the reduction of advertising charges by the Association of television and radio sales houses.

The survey recorded 10 actions aimed at developing voluntary schemes and private-public partnership (9 of them in Europe). Product reformulation is probably the private sector action which might bring the most relevant benefits (a major example is the reduction of salt content in processed foods) and which can be hardly governed by a regulation. Spain is at the forefront in this type of action, with 5 agreements signed by the Ministry of Health with the Spanish Baker Confederation (to reduce salt content in bread), with Vending Machine Providers (to limit provision of vending machine to schools and redress the balance between unhealthy and healthy product), the Food and Drink Federation (for product reformulation and labelling), retailers (for promoting healthy own-products) and the Restaurants and Hotels Federation (to provide nutritional information in menus and for meal reformulation). Beyond this, Spain has promoted a self-regulatory code on food advertising to children.

Other selected examples of private sector action prompted by government action include an advertising code in Portugal and the Danish “Whole Grain” campaign, while outside Europe a noticeable case (more towards coercion than encouragement) is the Japanese national anti-obesity campaign, which involves local companies by asking them to provide guidance, education (and possibly workplace measure) to achieve weight-reduction targets. Although individuals will not be penalized for surpassing government limits, companies face financial penalties if their collective workforce does not meet the required targets.

#### *4.5 Availability measures for disadvantaged consumers*

Availability measures for specific population sub-groups refer to those interventions which aim at addressing obstacles to access healthy foods in disadvantaged areas, for low-income consumers or for consumers facing difficulties (e.g. mobility) in accessing points of purchase with larger availability or affordable healthy foods.

While availability issues have been emphasised in the US, with the definition of “food deserts” to indicate rural or urban areas with scarcity of retailers or where prices of healthy foods are too high for low-income consumers, the issue seems less relevant in Europe. Two social care programs for economically and socially disadvantaged consumer have been identified in this survey. The first has been promoted by the Scottish government with investment to promote the sale of fresh fruit and vegetables in shops located in low-income areas. This has recently been extended to England, in collaboration with the Society of Convenience Stores. The second is a Danish project to provide a healthier food choice to children and youngsters who practice sports, in order to overcome more traditional but less healthy eating habits.

#### *4.6 Liability laws*

Liability laws are those which ascribe the responsibility for adverse health outcomes of consuming a product to the producers, the most notable case being the recent lawsuits against tobacco

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<sup>36</sup> The up-to-date database is available at [http://ec.europa.eu/health/ph\\_determinants/life\\_style/nutrition/platform/database](http://ec.europa.eu/health/ph_determinants/life_style/nutrition/platform/database)

companies which have been found responsible to withhold relevant information on smoke-related diseases. The legal liability approach to allocate financial responsibility between producers and consumers is common in the US system, although obesity cases against fast food companies have been dismissed and a recent bill forbids similar lawsuits against food producers. This model of dealing with “product failure” is not transferable to the EU system, which is ruled by the precautionary principle where a regulatory approach is followed. The only case of liability law included in our data-set is thus the US House of Representatives bill which followed the *Pelman v. McDonald's* case and prohibited people from suing firms for their obesity, hence recognising personal responsibility in obesity outcomes.

## **5. Policy interventions not explicitly targeted at healthy eating but relevant**

Under this heading we have classified those interventions (mainly related to farm policy or VAT regimes) which are not explicitly developed to influence the healthiness of diets, but that may have a major role as they do alter relative prices or food supply. An intense debate has developed about the effects of the Common Agricultural Policy (CAP) on dietary quality, with arguments that farm support leads to a higher price for fruit and vegetables and that price subsidies increase the production and availability of sugar and fats. However, it has been shown<sup>37</sup> that CAP is actually beneficial to diets, as the price support system make calories more expensive to consumers and in relative terms healthy foods like fruit and vegetables have a lower premium compared to dairy products or sugar, so that they are made relatively more attractive by the policy.

At the national level, four policies were selected as relevant in Europe, three of them from Poland. In Poland, the “Act on the health conditions of food and nutrition” which is basically a food safety law (which includes liability principles) may be relevant in terms of labelling requirements and inspection powers.

Discrepancies in VAT rates between healthy and unhealthy products are likely to have an effect on healthy eating and two examples of relevant policies are VAT rates set in Poland and the UK. In Italy the VAT on food products is 10% compared to 20% for all other products. In the UK no VAT is applied to foodstuffs, and in Poland the rate on food is between 3% and 7%. In the UK, the differentiation of the VAT rate is broadly related to the health level of the food product, as most foods are zero-rated, but several items are standard-rated. These include alcoholic drinks, confectionery, crisps and savoury snacks, food for catering or hot takeaways, ice cream and soft drinks.

## **6. Generic policies**

While broad policy documents are generally excluded from this survey, there are a few broad-scope interventions towards healthy eating which develop into specific policy actions not classified under other headings or with multiple measures. In England, the “Healthy Towns' programme” provides funds to nine towns (see Appendix for a list) to support testing and evaluation of initiatives for healthier lifestyles. The program – which is thus not confined to any type of specific action – is also under the broader umbrella of the Change4Life program, with stakeholder involvement. In Portugal there is a “Platform against obesity” which affects the way nutrition information is displayed in food labels, but also awards to restaurants which reformulate their menus in a healthier way. Spain has also adopted a global “Strategy for Nutrition, Physical Activity and the Prevention of Obesity” which also drives the private-public agreements described in a previous section. The strategy is multisectoral which affects families, schools, industries and the health system. Germany has also set up a “Platform for Diet and Physical Activity” which develops “good practices” in general, includes

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<sup>37</sup> See Mazzocchi, Traill and Shogren (2009, p. 140) and references therein.

training and information actions and provides the support to test novel actions to reduce overweight and obesity. The French programme to reduce cardiovascular risks allocates about € 30 millions to a number of actions including information provision, monitoring of factor risks in schoolchildren, involvement of the private sector to reduce salt content in food products, and flour fortification. In Denmark the program “Taste for Life” relies on a mobile task force which supports schools and institutions in promoting healthier food habits.

Finally, Finland has probably the most well-known examples of “community-based” action with involvement of the private sector, as the North Karelia project which ran between 1972 and 1997 is often cited as one of the most effective interventions to reduce the burden of lifestyle-related disease. In fact, the region of North Karelia showed a significantly greater decline in mortality from circulatory and heart diseases than the rest of Finland in the 1970s (although starting from a higher level), although this gap eventually levelled. Other risk factors like blood pressure or smoking levels also showed a decline, but it is not straightforward to ascribe these results to the project.

## 7. Conclusion

This report provides a survey of policy interventions towards healthier eating, based on a specific definition of policy which rules out any micro-level action which is not promoted by a national or regional authorities. Although all efforts were made to ensure the inclusion of any relevant policy intervention, the survey does not aim to be a complete and exhaustive review of measures taken in Europe, but rather to provide a complete picture of existing typologies of policy action. To this purpose, the list of 119 interventions consistent with the preliminary definitions identified within Europe has been integrated with 8 major interventions outside Europe, so that at least one case for each typology has been considered.

While an assessment of existing evaluations goes beyond the purpose of this report, the mapping allows to draw some general point about the current status of healthy eating policies in Europe:

- Information campaign and education measures are by far the most exploited policy actions, although no clear evidence exists that a more informed choice and better knowledge translate into healthier behaviour
- There is some resistance to implement fiscal measures, because of their costs to taxpayers, but also because the actual health outcome and any potential regressive effects are still being investigated. While “fat taxes” are now being considered in some European countries, they are unlikely to make a difference in terms of consumption choices, but they might generate high tax revenues which could in principle be ring-fenced to fund other healthy eating measures.
- Rather than developing new fiscal policies, action to adjust relative VAT rates for different types of foods, may also act as incentives towards a healthier diet
- There’s a growing emphasis on controls at the catering level, especially for school meals and vending machines in schools. Among intervention on vending machines, other than a complete ban, the introduction of fresh and healthy products has been shown to be potentially effective in some pilot projects
- Restrictions on food advertising to children have been recently put in place in some European countries and some studies have shown their relative effectiveness in non-European countries
- In Europe there’s a successful history of co-operation between the public and private sectors to avoid an excess of regulations which may bring unnecessary burden to firms and public authorities. In several countries agreements have been reached to lead to product reformulation, in particular with regard to the reduction of salt content

As a general final remark, the survey has shown that macro-level policies to address unhealthy eating patterns are at an early stage in Europe and a thorough monitoring and evaluation effort is required to calibrate these actions towards success and select among alternative intervention. To this purpose, it is necessary to go beyond the mere measurement of awareness or knowledge changes following the intervention and monitor longer term behavioural and health consequences. Current data collection systems are not yet adequate to provide proper information for a comprehensive evaluation which covers economic determinants, attitude changes, behavioural and health outcomes.

## Appendix

Country	Name of the intervention	Geographical scope	Description	Primary classification	Secondary classification	Length-Duration
<b>Advertising controls</b>						
FR	Food advertising: mandatory health messages	France	The general objective is to regulate food advertising. Food products advertisements (in television, press, internet or radio) have to be followed by public health messages (law n° 2004-806 of August 9, 2004). There is a fee of 1.5% of the total advertising investment for failure to comply with the law.	Advertising controls (adults)		Since 2007
CA	Ban on all advertising to children under 13	Quebec region	In 1980, the Quebec Consumer Protection Act banned advertising directed to children under the age of 13. Products and programs are rated according to their appeal to children, and goods such as toys and children's food products cannot be advertised during children's programs. Adult advertising and public service announcements are allowed, but are highly regulated. The result is that child television advertising is banned on Saturday and Sunday morning, and during the weekdays after school.	Advertising regulation (children)		Since 1982
IE	Ban on television advertisements for sweets and fast food	Ireland	A new law prohibiting the use of celebrities and sports stars to promote junk food to kids.	Advertising regulation (children)		2005
UK	Ofcom Advertising Standards code	England	A package of rules aimed at reducing the impact of television advertising of high fat, salt and sugar (HFSS) food and drink to children.	Advertising regulation (children)		since 2007
<b>Availability measures</b>						
DK	Food in motion	Denmark	Food in Motion is a three-year project, initiated in 2005 by the Danish Cancer Society with the purpose of breaking away from these deep rooted food traditions by furthering the availability of healthy food and beverages for children and young people who practice sports in Danish sports clubs.	Availability measure		2005-2007

UK	Scottish Grocer's Federation (SGF) Healthy Living Programme. (Scottish Government , 2004)	Scotland	Established in 2004 by Robert Wiseman Dairies with the support of the Scottish Government and the five main convenience store operators in Scotland. Its objective was to encourage convenience stores to develop the fresh produce and the healthier products they offer in their local communities, to help improve the eating habits of people living in Scotland, especially in low-income areas. The programme was launched as a six-month pilot scheme in April 2004. In March 2005, Phase Two was launched involving 197 stores, with investment in equipment and refurbishment to allow retailers to move fresh fruit and veg displays to the front of their stores. Under Phase Three, companies already signed up will be encouraged to roll out the scheme to all their branches. The programme continues to receive the support of the Scottish Government who recognised its effectiveness particularly in neighbourhoods with low levels of car ownership and limited public transport. Together with the substantial inward investment of the retailers themselves, the programme has developed to include 600 stores.	Availability measure	Govmt encouraging private sector action	since 2004
<b>Education measures</b>						
PT	Community weight - Part of the Platform against Obesity (Municipality of Oreira (Lisboa District))	Municipality of Oreira (Lisboa District)	It is an obesity prevention program. It is made up of 15 lectures realized at FMH during post-work time. It is free and open to everybody. Objects are promotion of physical activity, healthy eating, behaviour strategies to self manage health and weight.	Education (adults)		2005- ongoing
IT	Piemonte Obesity Project (Piemonte)	Piedmont Region	The objective was to improve the health of overweight or obese population between 20 to 70 years old, through meetings chaired by specialist staff	Education (adults)		The project has been launched in 2005 and is still on. (3)
PL	The POLKARD Programme (POLKARD Narodowy Program Profilaktyki i Leczenia Chorób układu sercowo-naczyniowego)	Poland	The main objective of the programme is popularisation of modern prophylaxis of cardiovascular diseases. The particular goals include education of society on the prophylaxis methods and pro-health behaviours (intensification in physical activity, healthy diet, fight against hypercholesterolemia, arterial hypertension, metabolic syndrome, obesity, diabetes, addiction to tobacco) also among youth and children.	Education (adults)	Education (children)	1st edition 2003-2005, 2nd edition 2006-2008 to now
PT	5 a day - Part of the Platform against Obesity (Alentejo region)	Alentejo / Lisboa region	The program is aimed at promoting daily fruit and vegetable consumption ( 5 portion per day) among children (7-12 years old) and healthy lifestyles.	Education (children)		October 2007- ongoing
PL	Bet for milk and dairy products	Poland	Aimed at improving awareness of the role of milk in diets, especially for children. The campaign is directed at children and their parents and carers.	Education (children)	Information campaign	2008 up to now

DK	Children, food and motion, developed and implemented by The Region of Funen, 10 municipalities on Funen, Danish Cancer society, The Board of Health and Ministry of Health and interior.	Region of Funen	A pilot project. The purpose was to improve health and well-being among children in the Region of Funen. In order to do this a number of different activities was carried out in the schools in the area.	Education (children)		2002-2004
IT	Diet, physical activity, lifestyles: instruction for use (3 regions)	Piemonte Abruzzo, Calabria, Puglia (regions)	Addressed to students of 190 schools including primary and secondary schools The objectives of the project were: to analyze students eating habits and their physical activity and to improve their lifestyle; to develop useful action for obesity prevention in school population.	Education (children)		The project was implemented in the school years 2004/2005 and 2005/2006
IT	Eating together (Emilia Romagna)	9 cities of the Emilia-Romagna region	It is a pilot nutrition education intervention aimed at teachers, pupils and their families to promote a nutritionally balanced food consumption.	Education (children)		Three years (2002-2005)
ES	EDAL (Reul (city, Cataluna))	Reul (city, Cataluna)	Aimed at promoting health nutrition among children (8 years old in 2006-07)	Education (children)		3 years (starting in 2006-07 school year)
FR	EPODE (225 cities)	France, 225 cities	EPODE is a prevention program aimed at decreasing the prevalence of childhood overweight and obesity through the promotion of a balanced, diversified, affordable and pleasant diet and encouragement for children and families to be more active, play more and exercise on a regular basis.	Education (children)	Information campaign	The town commit for 5 years in the EPODE programme.
IT	Feeding culture	Italy	The main objectives of the program are:- to promote a balanced and healthy nutrition;- to develop awareness of a right food consumption;- to disseminate knowledge about the national agro- food system. Target: teachers and school children in infancy, elementary and secondary schools, families. A new edition of the project started in the year 2003.	Education (children)		Ongoing since 1998

FR	FLVS - Fleurbaix Laventie Ville Santé Study	France	Fleurbaix Laventie Ville Santé Study (FLVS) is a long-term intervention pilot programme conducted by FLVS NGO (a Non-Governmental Organization) in two cities in the north of France (Fleurbaix and Laventie). The FLVS study was designed in 1991-1992 and divided in two periods: 1) The first period, from 1992 to 2000, aimed to evaluate whether or not integrating some nutritional education into school programs could modify children's and their families' eating habits. It was a school-centred intervention designed by an educational board (teachers, scientists, nutritionists, school doctors) and focused on nutritional and practical lessons in and outside schools (cooking courses, visits to the market and supermarkets, tours of manufacturing or agricultural food production units). 2) The second one, from 2000 to 2004, had the objective to evaluate the influence of a program including local stakeholders to modify lifestyle. It aimed at the promotion of more physical activity and less sedentary behaviour through educational workshop in school and sport activities, family workshops and consumer educational events in cities. It involves a broader target (not only children but also the families) and health professionals (pharmacists, dieticians...). Moreover, it involved the mobilization of local stakeholders (politicians, media, associations and sport clubs ...) (2). In 2003, given successful results of the study, FLVS NGO decided to design, set up and implement an innovative methodology, consistent with the official French guidelines on nutrition, diet and physical activity: the EPODE program. The cost of the study covers intervention (2 euros per year per inhabitant) and scientific research and assessment (75 euros per year per inhabitant) and it is funded by public funds (20%) and private funds (80%).	Education (children)	Education (adults)	It was a twelve years study, from 1992 to 2004
UK	Fuel Zone	Scotland	Promotion of healthy eating in secondary school (introduction of a new healthy menu range, tariff incentives for healthier food items, introduction of a web based points reward scheme which further promotes the uptake of healthy options)	Education (children)	Meals regulation (schools)	Initially developed in Glasgow 1996. Fully implemented since 2004
DK	Get healthy having fun (part of Everything about nutrition.	Denmark	The purpose is to make children improve their health by having fun. This included different board games, a "festival", etc.	Education (children)		2008- ongoing
IT	Guidance activities in foods consumption and nutrition education (Emilia-Romagna Region)	Emilia Romagna	Education intervention on healthy food habits and food awareness. Targets: primary and secondary school students, teachers and parents; Public personnel who manage food school catering services.	Education (children)		From 2003 to 2008
PT	Health against Obesity - Part of the Platform against Obesity (Porto)	Porto	It is a health education program directed to parents and teachers of children in 1st and 2nd cycle of education. The objective is changing behaviours and lifestyle connected to physical activity and nutrition. Data on household lifestyles will be collected.	Education (children)	Education (adults)	3 years

IT	Healthy eating for your child	Emilia-Romagna Region	Involvement of the school catering in the promotion of organic food consumption.	Education (children)	Meals regulation (schools)	Academic year (2005-2006)
IT	I COLORI DEL CIBO (The colours of food) (Lazio)	Lazio (Roma, Viterbo, Frosinone, Latina, Rieti)	Education intervention on healthy food habits and food awareness. The target involved in the project are schoolchildren of 9-14 years and their teachers	Education (children)		Academic year 2007/2008
PL	I know what I eat (City of Warsaw)	Warsaw	Objectives: introduction of health education and improvement of children nutrition in kindergartens and schools. Target: preschool children, pupils of primary schools, parents, directors of schools.	Education (children)		2006 up to now
PL	Keep Fit !	Poland	The objective is the promotion of healthy habits (lifestyle and nutritional habits). Target: adolescents (5000 secondary schools)	Education (children)		2006 up now
IT	Know the flavours	Lazio Region	Education intervention on healthy food habits and food awareness. Targets: Schoolchildren of primary and secondary school, teachers.	Education (children)	Information campaign	Ongoing since 2003
IT	L'ORTO A SCUOLA (The school vegetable garden yard)	Emilia-Romagna Region	The project was promoted by Emilia Romagna Region and involved children in nursery, primary and secondary schools. The main objective was to promote a higher vegetables consumption in pupils through the creation of a vegetable garden near the school, with the help of teachers, parents and grandparents. 109 schools participate to the initiative. The project focused on the didactic value of practically attempting the cultivation of fruits and vegetables: children planted, fertilized, harvested organic products, and these activities offered them a starting point to reflection. Didactic tools were distributed to teachers. The basic project was supported and integrated with other activities such as: exhibition, events and tasting experiences of cultivated products, laboratory activities associated with scientific deepening about land, design of educational stories for nursery children.	Education (children)		From 2006 to 2008
PL	National Cholesterol Prevention Programme (Narodowy Program Profilaktyki Cholesterolowej)	Poland		Education (children)		1986 up to now ?
IT	Nutritional education: an integrated intervention (Lombardia)	Lombardia (21 municipalities)	A nutritional education action carried out in primary schools, new diets introduced in schools including fruit for the mid-morning snack, nutritional education given to families through meetings and an educational booklet.	Education (children)		The project lasted from 1993 to 1996

ES	PERSEO program - NAOS strategy ( 7 regions)	Andalucía, Canarias, Castilla y León, Extremadura, Galicia, Murcia, Ceuta y Melilla	The PERSEO program reaches 67 schools and more than 12.000 children (6-10 years old). It teaches pupils about health eating and it promotes physical activity during and after school hours. The targeted schools are all public schools and a large number are located in low socio-economic districts.	Education (children)		2008-09
NO	Physical activity and meals in schools.	Norway	Aimed to promote healthier eating and increase physical activities in schools.	Education (children)		2004-2006
PT	Programa Educativo "apetece-me"- Part of the Platform against Obesity	Portugal	It is a Nestlé Portugal initiative with the Minister of Education. It is aimed at providing information about food, nutrition, health and well-being in school. It is targeted to teachers and children of 1st , 2nd and 3rd cycle of education.	Education (children)		2008
PT	Project Zero Obesity (POZ)- Part of the Platform against Obesity (6 Municipalities)	6 Municipalities (Melgaço, Mealhada, Cascais, Beja, Silves e Faro)	The principal aim is promoting health and health education among children (6-10 years old) who lives in family with overweight issues. The main objective is to promote a healthy cooking program and a food advice program in families with overweight children	Education (children)	Education (adults)	1 year (starting September 2009)
PT	Projecto com Peso e Medida - Part of the Platform against Obesity (Municipality of Santa Maria da Feira)	Municipality of Santa Maria da Feira	The project has these two main general objective: 1) To promote and protect general health and prevent disease within the educational community. 2) To diagnose the problem of obesity within the educational community in the council of Santa Maria da Feira. Target Population: Students from the 7th to 12th grade of Education of the council.	Education (children)		School year 2008-09
IT	Regional project for nutritional surveillance and education in schools (Marche)	Marche region	Aiming at promoting in the school population a healthy and balanced nutrition.The target: children of the nursery school, primary school ,teachers, families, staff .	Education (children)		School year 2004-2005
DK	School fish (part of Fish twice a week) (Region of Copenhagen)	Region of Copenhagen	An education programme for children. School fish consists of a webpage with information on fish and recipes on fish dishes. Closed down.	Education (children)		2006
IT	Snack agreement (City of Udine)	Udine (city of Friuli-Venezia Giulia region)	The agreement lied in undertaking at educating children about healthy, tasty and nutritionally adequate snacks.	Education (children)		School Year (from 2003 to 2009)
PL	The National Primary Prevention Programme of Neural Tube Defects in Poland Program Pierwotnej Profilaktyki Wad Cewy Nerwowej	Poland	The programme aims at popularisation of knowledge on folic acid and its connection to the Neural Tube Defects in children among all social groups, at change of attitudes and at formation of appropriate behaviours regarding folic acid. Its goal is to increase folic acid intake 0,4 mg of folic acid on a daily basis among all women in childbearing age capable to be pregnant, to reduce a risk of NTD in their babies.	Education (children)		1997 up to now

IT	The scarecrow (City of Cremona)	Cremona (city of Lombardia)	Education intervention on healthy food habits and food awareness. The target are the students of primary schools and secondary schools, their teachers, and their parents	Education (children)		Ongoing since 1999
<b>Fiscal measures</b>						
US	Twinkie Taxes (Local Governments)	31 states:	Thirty states and D.C. currently have laws that tax foods of low nutritional value such as soda, chips, pretzels, ice cream, gum, and candy. These states are California, Colorado, Connecticut, D.C., Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Minnesota, Mississippi, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.	Fiscal measure (population at large)		various years
UK	Healthy Start (Department of Health)	England	Eligible families get free vouchers every week which they can swap for milk, fresh fruit, fresh vegetables and infant formula milk. They can also get free vitamins. Healthy Start replaces the Welfare Food Scheme.	Fiscal measures (target groups)		since 2004
PL	State aid for feeding program	Poland	The aim of the program is to, inter alia, support communities in fulfilling their tasks on a compulsory for feeding children and provide meals to persons deprived, in particular from areas of high unemployment.	Fiscal measures (target groups)		2005 up now
PL	The school milk program	Poland	The School Milk Program is administered by Agricultural Market Agency (ARR) since 2004. It has been co-financed by the Milk Promotion Fund. Milk and milk products are supplied to schoolchildren at a lower price or free of charge for families.	Fiscal measures (target groups)		2004 up to now
<b>Generic / multi-action measures</b>						
DK	Everything about nutrition - taste for life	Denmark	Objectives: -To improve the eating habits of children and adolescents in schools and institutions. -To provide the common Danish citizen with trustworthy information on healthy food and Among the tools there is a mobile task force helping communes, schools and institutions improving healthy food.	Generic / multi-action		The overall intervention was initiated 2002. It is an ongoing intervention. The sub-interventions has a stricter defined time limit.

UK	Healthy Towns' programme (cross-government strategy for England between 2008/09 and 2010/11 )	England	<p>The Healthy Community Challenge Fund (HCCF) provides funding to a nine local areas to test and evaluate their ideas on how to make activity and healthier food choices easier for local communities in a programme that ends in 2011. The nine 'Healthy Towns' are: Dudley, Halifax, Manchester, Middlesborough, Portsmouth, Sheffield, Tewkesbury, Thetford and Tower Hamlets.</p> <p>The towns form part of the Change4Life coalition, which is backed by Government, food retailers, charities and community groups. A further 13 towns have also had funding: Peterborough, Corby, Sandwell, Preston, North Tyneside, Leicester, Merton, Coventry, High Wycombe, Stockport, Wandsworth, Weymouth &amp; Portland, Wakefield.</p>	Generic / multi-action		2008-2011
FR	National program to reduce cardiovascular risk	France	<p>The Programme national de réduction des risques cardiovasculaires is a three-year program launched by the Ministry of Health in 2002. Among the program objectives there is the promotion of the cardiovascular prevention by acting on risk factors. The preventive measures include the reduction of the obesity and dyslipidemia incidence, consumption of salt and flour fortification with folic acid (1).</p> <p>1) Reduction of the obesity and dyslipidemia incidence. Measures: Implementation of the Interministerial Circular N. 2001-118 of 25-6-2001 which provides information to improve the nutritional quality of meals and food environment in schools; Implementation of measures for early detection of childhood obesity and its management; Information and nutrition education of the National Nutrition and Health Program (PNNS) 2001 - 2005; Creation or strengthening of diet and nutrition consultations in hospitals</p> <p>2) Reduction of salt consumption. Measures: Implementation of experts recommendations on the reduction of salt content in bakery products; Discussion with food manufacturers to reduce salt content of the industrial preparations; Information campaign on the relationship between salt and health</p> <p>3) Flour fortification with folic acid Measures: Development of a project taking into account the public health objectives, particularly in terms of prevention of cardiovascular disease. With a budget of 30 million euros, the Ministry of Health proposes to reduce by 20% cardiovascular diseases over the next ten years.</p>	Generic / multi-action	Govmt encouraging private sector action	From 2002 to 2005

PT	Platform against obesity	Portugal	Aimed at reducing the prevalence of obesity in children and young people and controlling the increase in the epidemic. It includes the reformulation of nutritional information on food labels. The goals of the Platform relate to reducing the prevalence of obesity in children and young people. Among the other initiatives "Healthy menu" awards will be given to deserving restaurants.	Generic / multi-action	Information campaign	May 2007- ongoing
ES	Strategy for Nutrition, Physical Activity and the Prevention of Obesity (NAOS, Estrategia para la nutrición, actividad física y prevención de la obesidad)	Spain	The Ministry of Health and Consumer Protection, in partnership with over 80 public and private entities, developed the Strategy for Nutrition, Physical Activity and the Prevention of Obesity (NAOS). The primary goal of the strategy is to significantly reduce the incidence and effects of chronic diseases through the national promotion of a healthy diet and physical activity, particularly focused on obesity and unhealthy behaviors in children and adolescents. The multisectoral approach of the Strategy includes recommendations for actions in four sectors: family and community, schools, private sector, and the health system.	Generic / multi-action		2005-ongoing
DE	The German Platform Diet and Physical Activity	Germany	The PRINCIPAL OBJECTIVE is the prevention of overweight and obesity among children and young people FOUR FIELDS OF ACTION:1. Clarifying causes and developing "good practices"; 2. Conveying knowledge and training players;3. Informing the public and disseminating the work of the Platform (media) 4. Testing new approaches.	Generic / multi-action		The Platform was founded in 2004. No particular policy period was mentioned. The Platform is always looking for new partners to work with.
<b>Government actions to encourage/coerce private/sector action</b>						
ES	Agreement between Ministry of Health and Restaurants and Hotels Federation	Spain	The commitment is : - to provide nutrition information to customers- to encourage fruit and vegetable consumption - to reduce saturated fat intake and substitute animal fat with vegetable fat- to not use oils rich in saturated fat acid and to use iodum salt	Govmt encouraging private sector action		
ES	Agreement between Ministry of Health and Spanish food and drinks Industries Federation.	Spain	The objectives are:- promoting the inclusion of nutritional information in labels (July 2005)- promoting the commercialization of food for children with low saturated fat, salt, and sugar content- studying new portion sizes - reduce salt content in those food which are more responsible of population salt consumption	Govmt encouraging private sector action		
ES	Agreement between Ministry of Health and Spanish food and drinks Industries Federation.	Spain	Commitment of large food retailers to promote the healthy eating strategy and own products that are consistent with the strategy	Govmt encouraging private sector action		

ES	Agreement between Spanish Ministry of Health and Spanish Bakers Confederation.	Spain	The objective of the agreement is to reduce the Spanish bread salt content from 2.2% to 1.8% in 4 years.	Govmt encouraging private sector action		4 years
ES	Agreement between Spanish Ministry of Health and Spanish National Association of Vending Machines Providers	Spain	The commitment is - to not install vending machines in places where children of primary school can easily access - to delete advert on the machines- to increase the inclusion of healthy products with respect to unhealthy items	Govmt encouraging private sector action		
JP	Anti-metabo campaign (The Ministry of Health )	Japan	National anti-obesity campaign targeted to all Japanese citizens between 40 and 74 and involving local companies and governments. Overweight people receive dieting guidance and education. (Although individuals will not be penalized for surpassing government limits, companies face hefty financial penalties if their collective workforce falls short of the targets within the allotted time.	Govmt encouraging private sector action	Education (children)	2008
DK	Danish Whole Grain campaign	Denmark	The aim of the wholegrain campaign is to create target-oriented and effective interventions to ensure that the Danes eat more wholegrain and thereby improve public health.	Govmt encouraging private sector action	Information campaign	2009 - ongoing
FI	North Karelia Project,	North Karelia Region	The aim was to reduce the risk factors for cardiovascular disease. The project combined a population approach and the aim was to reach the entire population in the region of Northern Finland. This included media campaigns, involvement of regional organizations, lay leaders and the public.	Govmt encouraging private sector action	Information campaign	1972-1997
PT	Self-regulatory Code of Good Practice in Commercial Communication to Minors	Portugal	The Code has a general clause on food and beverage advertising to minors on tv, internet, cinemas and videogames.	Govmt encouraging private sector action		Sept 2005
ES	Spanish Self-Regulatory Code on Food Advertising to Children (Codigo PAOS)	Spain	The Code covers food and drink advertising to children under the age of 12 years.	Govmt encouraging private sector action		
<b>Information campaigns</b>						
UK	5 a day Programme (Department of Health)	England	The information programme aims to increase awareness of the health benefits of fruit and vegetables, particularly targeting those groups with the lowest intakes. It includes the introduction of a logo on food products indicating fruit and vegetable contents and school interventions	Information campaign	Labelling	since 2003
PL	5 servings of vegetables, fruit or juice	Poland	It is intended to reach as many people as possible and encourage the diversification of their diet with fruit, vegetables and juices.	Information campaign		since february 2009-2010

CA	5 to 10 a day	Canada	The goal is to reduce the risk of cancer and cardio-vascular disease, by encouraging Canadians to consume at least five servings of vegetables and fruit a day as part of a healthy diet	Information campaign		since 1999
DK	6 a day	Denmark	The purpose of the campaign is to raise the daily intake of fruit and vegetables to "6 a day" - (hence the name) app. 600 gram.	Information campaign		Initiated 1995. The campaign has been carried out in three time spans: 2001-2003; 2004-2007 and the ongoing 2008-2011.
DK	An easier childhood, developed and implemented by Board of Health.	Denmark	In order to prevent obesity among children the campaign focuses on preventing obesity among children at the age 4-6 years. This is done by pointing the message at the parents and pedagogues and teachers. The job is primarily carried out in the message in a webpage, but also leaflets and a tv spot is made.	Information campaign		2009- ongoing
FR	Campaign promoting fruits and vegetables consumption (PNNS- National Nutritional-Health Program- media campaign)	France	Campaign promoting fruits and vegetables consumption. This first campaign was launched in 2001 and resumed in 2002 and 2003. Its objective was to promote fruit and vegetables in all forms (fresh, canned or frozen) focusing on their positive effects on health ("fruits and vegetables protect your health").	Information campaign		Since 2001
UK	Change4Life (Department of Health)	England	It is a society-wide movement aiming to prevent people from becoming overweight by encouraging them to eat better and move more. In this initial stage, it targets young families.	Information campaign		since 2009
IT	Correct nutrition and promotion of physical activity	Italy	Promoted by the Ministry of Health and addressed to the whole population, with special emphasis on young people and women. The goals of the campaign are the prevention of incorrect nutritional behaviours and the promotion of physical activity. The messages were diffuse above all through press and posters. The intervention utilized also advertising spaces in newspapers and magazines and an online campaign ("Advices for everybody").	Information campaign		The campaign had lasted for 4 months in 2004

FR	Diabète, halte aux complications (Diabetes, stop the complications)	France	<p>The French Association of Diabetic (AFD) launched in 2008 the national campaign: “Diabetes: stop the complications”. The campaign purpose is to inform and educate people in order to avoid complications and live well with diabetes, through:</p> <ol style="list-style-type: none"> <li>1. Warn people with diabetes (primarily type 2 diabetic) on the realities of complications.</li> <li>2. Information on practices and behaviors to prevent or delay complications.</li> <li>3. Educate general practitioners about the importance of taking into account their patients’ quality of life.</li> </ol> <p>Under the campaign, AFD is organizing some information days across France with the aim to fight against diabetes complications.</p>	Information campaign		2008-2009
IT	Diabetes	Italy	<p>It is a communication campaign promoted by the Ministry of Health according to the 2003-2005 National Health Plan, whose main objective was to raise the awareness about type 2 diabetes and prevent its incidence, by focusing on healthy lifestyle. The expected outcome of the campaign was to reduce the incidence and complications of type 2 diabetes. The information conveyed through the campaign regarded the importance of: weight control, balanced nutrition and regular physical activity. The primary target was the whole population, while the secondary involved male and female population over 40. The tools used for dissemination of information were: information leaflets, posters at airports and major stations, transit advertising on buses, trains, metro, radio and TV spots, website, events in the diabetes national day.</p>	Information campaign		One year (2004)
IT	Eat well grow better	Italy	<p>addressed to students and teachers of secondary schools. Its aim is to convey to children the importance of healthy eating and to teach them how to value promotional messages in a critical way.</p>	Information campaign		Ongoing since 2008

UK	Eat Well to keep well	N.Ire.	The 'Eat well to keep well' campaign was developed by the Agency to raise awareness of the protection offered against cancer by eating more fruit and vegetables and to encourage the public to eat five or more portions each day. The campaign, launched in June 1998, centred around a 50-second television advertisement, and a 10-second version.	Information campaign		1998-1999
IT	Eat well, live healthy	Italy	The objectives were: - To encourage healthy lifestyle;- To promote a balanced diet with particular support of Mediterranean diet;- To discourage young people from diets "do it yourself";- To promote a more active lifestyle. The target was general population and in particular young .(tv, radio, advertisements)	Information campaign		One year (2003)
NO	Enjoy eating	Norway	The goals of the campaign was to improve food habits and the health of the population. The campaign wanted to stimulate local activities that could change diet and to stimulate collaboration between public sectors, voluntary organizations, industry and media in activities related to improving food habits.	Information campaign		1990-1994
IE	Every Step Counts - Small Changes Make The Difference	Ireland	National public awareness campaign to help tackle the issues of overweight and obesity in Ireland (initiatives: leaflets and posters; supermarket activity; nationwide dance events for young people; fun record-breaking initiatives; press competitions and give-aways, workplace information programmes)	Information campaign		2004
IT	Feast of the colours of life, the 5 colours of wellness	Italy	The aim of the project was to give food consumers essential information about fruits and vegetables and their protective and color-related properties. The project consisted in an advertising campaign using newspapers, radio and television, underlining the role of a correct nutrition based on fruit and vegetables in disease prevention.)	Information campaign		The project lasted 3 years, from February 2004 to January 2007
PL	Fish affect all and everything	Poland	The aim of the campaign is to increase consumption of fish and fish products by informing the public about the beneficial effects of fish diet on the functioning of the body. TV and radio spots are addressed to people in different age and different social groups. (Ministry of Agriculture and Rural Development)	Information campaign		2008 up to now

DK	Fish twice a week.	Denmark	The purpose is to promote the consumption of fish and shellfish and to support the nutritional recommendation of eating fish twice a week.	Information campaign		2005-2008
ES	Five a day (5 al dia)	Spain	The program is aimed at encouraging people to eat five portions of fruit and vegetables a day. Tools are: TV advertising spots, Public awareness campaigns, conferences, 5-a-day days, workshops for children, website.	Information campaign		2002-ongoing
UK	Food and Well Being: Reducing Inequalities through a Nutrition Strategy for Wales (FSA-Wales)	Wales	An action plan aimed at encouraging the people of Wales to understand and act upon the need to adopt a healthy diet. Food and Well Being – reducing inequalities through a nutrition strategy for Wales was launched in 2003 and is a joint FSA Wales and Welsh Assembly Government strategy.	Information campaign		2003
PT	For us - Part of the Platform against Obesity (Salvaterra de Magos Municipality)	Municipality of Salvaterra de Magos	The general aim is preventing and managing obesity and diabet.	Information campaign	Education (adults)	4 years
UK	FSA's salt campaign (Food Standards Agency)	England	Social Marketing to reduce salt consumption (no more than 6 grams per day)	Information campaign	Govmt encouraging private sector action	First Salt Campaign 2004 (only a few months). Since 2007 wider campaign
IT	Gaining Health- To make healthy choices easier	Italy	It is a proposal for “multicomponent” interventions (among which school interventions), with communication activities and actions to decrease new smokers, increase fruit and vegetable intake, reduce the consumption of high calorie beverages and foods, promote a more active lifestyle.	Information campaign	Education (children)	Ongoing since 2007
AU	Go for 2&5	Australia	Aimed at increasing fruit and vegetable consumption	Information campaign		since 2005
SE	Half a kilo a day	Sweden	Fruit campaign	Information campaign		
FI	Half a kilo a day, developed and implemented by Finnish Horticultural Products society.	Finland	Fruitcampaign	Information campaign		
BE	Happy Body Project	Belgium	Goals:-start a mentality change with the Belgian population, change daily habit; contribute to the creation of a socio-economic context that promotes balanced nutrition to all levels of society; promote a communal approach. Approach: Happy body tries to motivate everybody on a positive and easy way with playful interventions and actions based on scientific research. The campaign tries to approach the people in their daily environment. An active and healthy lifestyle is easy and possible every day.	Information campaign		minimum 3 year

PT	Healthy Lifestyle- Plataforma contra a obesidade	Nacional	The program provide daily advices on good strategies about healthy lifestyles. Issues are: nutrition, physical activities, stress reduction, physical and psychological wellbeing promotion. Tools are: website, a newsletter, radio programs.	Information campaign		2008-ongoing
SE	How do you eat SMART? Developed by Stockholm County Council	Stocholm region / Sweden	Began in Stockholm in 2001. Since 2009 national.	Information campaign		2001- ongoing
DK	Information campaigns	Country	Developed and implemented by the Danish Board of food. The overall purpose was to promote healthier eating habits in the general Danish population in order to prevent diseases and improve health.	Information campaign		1991-1996
IE & N.Ire	Little Steps Campaign (Health Service Executive, safefood (ROI), Health Promotion Agency (NI) 2008)	N. Ireland & Ireland	Developed by safefood and the Health Service Executive, Republic of Ireland, in collaboration with the Health Promotion Agency, Northern Ireland, “Little Steps Go a Long Way” is a major awareness campaign aimed at tackling the serious problem of obesity on the island of Ireland. The main targets are: Parents and guardians of school-going children. The campaign aims to show that by adopting small changes, little steps, to food habits and physical activity can have a big impact over time and lead to a healthier future. Research carried out for the campaign has demonstrated that the majority of mothers of overweight or obese children think that their children’s weight is fine for their age and those who may realise there is a problem feel overwhelmed by it and think the challenge is too great to tackle.	Information campaign		since 2008
UK	Liverpool's Challenge (Liverpool NHS Primary Care Trust 2008-2009)	Liverpool	Liverpool’s Challenge is a social marketing programme aimed at reducing levels of obesity in the city. The campaign was developed following extensive insight work. It takes the form of a challenge to people in the city to collectively pledge to lose one million pounds in weight and uses customer relationship marketing (CRM) techniques to engage and support pledgers. An extensive on-the-ground presence is supported by a heavyweight media campaign that keeps the Challenge high on the agenda.	Information campaign		2008-2009

UK	Points4Life, by Manchester City Council and Manchester NHS. The scheme will be launched to the public in early spring 2010	Manchester, England	It is a loyalty programme to encourage people to be healthier through the use of government, local authority and private sector funding Points4Life is connected to Change4Life, and is formally a sub-brand of Change4Life. The system is based on membership, loyalty points, loyalty cards and prizes. Members can redeem collected points for “healthy” products and services (food, drinks, exercise-related products, free swimming pool access, sports equipment, use of sports centres, etc.)	Information campaign		2010
IT	<i>Salt in food and the prevention of iodine deficiency and hypertension</i>	Italy	The objectives of the campaign were:-To eradicate iodine deficiency disorders through the use of salt enriched with iodine (30 mg of iodine per kg salt);- To reduce salt intake below 6 grams per day as prevention of cardio-vascular pathologies.	Information campaign		At national level, One year (1997)
IT	SAPERMANGIARE.MOBI (To know how to eat. mobi)	Italy	The initiative is based on an interactive website on food and nutrition, capable of meeting the population needs of knowledge, advices and information independent of commercial interest.The main purpose of the website is to combat misinformation and provide the knowledge to make healthy food choices easier.The target audience consists of young adults (18-40 years), more accustomed to the use of multimedia communication technologies.	Information campaign		Ongoing since July 2009
UK	Take life on, one step at a time	Scotland	The objective is to reduce the risk of cancer, heart disease and diabetes through changes to diet and lifestyle.	Information campaign		Since 2008
ES	Thao Project	5 pilot cities (2007-2008), 32 cities (2008-2009)	It is aimed at preventing children obesity. It is realized at city-level in a 4 years period. The objective is improving attitudes towards healthy lifestyle in children and families. It is based on the EPODE experience and is focused on community-based measures.	Information campaign		4 years (started in 2007 with pilot cities)
FI	The East Finland Berry and vegetable project (part of North Karelia Project)	North Karelia Region		Information campaign		
BE	Thursday Veggie Day	Belgium, the City of Ghent	The initiatives OBJECTIVES are to familiarize consumers with vegetarian food and with the advantages of eating less meat.(City of Ghent)	Information campaign		Since May 2009

BE	VIASANO	Belgium	The goal of the VIASANO program is to help families change their lifestyle in a thorough and sustainable way by the mobilisation of local actors. It's based on a method that encourages the effort of all local actors like the mayor, the local government, teachers, societies, health- and preventionworkers and the families of course. VIASANO focuses on the following points: no stigmatisation of behaviour, people and food; attention to the contemporary food demands and needs: small budget, daily, not much time, preparation of meal; a positive, stepwise and concrete approach on the fun of food, movement and doing things together; enforcement of the solidarity; promote sustainable health	Information campaign		2007-...
<b>Labelling policies</b>						
FI	Heart symbol	Finland	Developed and implemented by the Finnish Heart Association and The Finnish Diabetes Association.	Labelling		2000-ongoing
SE	Keyhole, developed and implemented by the National Food Administration	Sweden	The famous Swedish labelling system. Since 2009 the common Nordic nutrition label (except Finland). The aim of the intervention is to make the population make low-fat, high-fibre food choices. The key-hole is voluntary and free to use, and it does not require certificate but it is supervised by the local authority.	Labelling	Govmt encouraging private sector action	1989-ongoing
US	Nutrition Labelling and Education Act - NLEA	United States of America	The Nutrition Labelling and Education Act of 1990 (NLEA) requires most foods to bear nutrition labelling and requires food labels indicating nutrient content claims and certain health messages to comply with specific requirements. A large extent of the Act is dedicated to nutrition labelling. In addition to this, a whole set of nutrient content claims, including health claims, are described and explained.	Labelling		Mandatory since 1994
PL	Regulation on food labelling and additives	Poland	Regulation of the Minister of Agriculture and Food Economy on the labelling of foods, drugs and food additives permitted, intended for circulation.	Labelling		effective from 15. of July 1994
UK	Traffic light labelling	UK	Labelling system from the Food Standards Agency	Labelling		
<b>Liability laws</b>						
US	US House of Representatives and State Acts 2004	United States of America	After the Pelman v. McDonald's case it prohibited people from suing firms for their obesity. The underlying principle was that people had to accept personal responsibility for their actions.	Liability laws		Since 2004
<b>Meal regulations</b>						

CA	Eat Smart! Workplace cafeteria program	Ontario region	When workplace canteens meet the standards for a healthier diet, then they enter the Eat-smart programme, which allows to display a logo and receive informative toolkits. About 150 workplaces are currently certified by "Eat Smart!".	Meal regulation (workplace)	Information campaign	Since 2001
DK	Worksite fruit scheme	Denmark	The 6 a day research project was initiated in 1999 with funding from the private sector and the Ministry of Food, Fisheries and Agriculture, with the aim of identifying effective methods for increasing sales and consumption of fruit and vegetables. These methods focused on environmental and structural changes, instead of relying on health education strategies. The project is a public-private partnership with partners from governmental food and health organisation, non-governmental health organizations and the fruit and vegetable industry. 3 key areas were identified for this research: Schools, workplace and retail settings. Methods focused on increasing the availability of and access to fruit and vegetables in these settings, instead of health education. In 2000, these activities were supplemented by campaign activities, aimed at increasing awareness of the 6 a day message and disseminating the results of the research project. The interventions included fruit and vegetable subscription scheme for school children; worksite fruit schemes; Worksite Canteen Model Project; a Retail project in the town of Soenderborg and Weekly drop-box schemes.	Meal regulation (workplace)	Information campaign	Pilot in 2001
IT	Aware break: nutrivending	Veneto Region	Promotion of the availability in the vending machines of healthy food items	Meals regulation (schools)		It has been going on from 2006
IT	Fresh break - Fruit Snack. More taste and more health in schools and at work (Emilia Romagna)	5 cities of the Emilia-Romagna region	The main objective is the replacement of conventional snacks sold in vending machines with healthy snacks. Expected outcome: to gain greater awareness in food choices, encourage consumption of healthy foods. Where the vending machines are installed, pedagogical entertainment for children and young people and nutritional information meetings for adults are carried out.	Meals regulation (schools)	Information campaign	From December 2007 to May 2008
DK	Fruit Break, School fruit, part of 6 a day	Denmark	School children are provided with free fruit, with the aim of increasing their daily intake of fruit.	Meals regulation (schools)	Education (children)	Initiated 2001. On-going.
FR	Fruit for recreation time	France, schools in the ZeP (Priority education zones).	The project is characterized by distribution of one fruit per week throughout the school year to children in primary schools	Meals regulation (schools)		The academic year (2008-2009 and 2009-2010)
IT	Fruit snack	Bologna Roma Bari (Cities of North, Center, South Italy)	It is a pilot project directed to make available national fresh and processed fruit and vegetable in schools through vending machines.	Meals regulation (schools)		Scholastic years: 2006/2007-2007/2008

UK	Junk Food Ban	England	Regulation standards for vending machines, breakfast clubs and tuck shops in schools.	Meals regulation (schools)		Since 2006 (voluntary). From 2008 compulsory for primary schools. Compulsory for secondary schools from 2009.
NO	More fruit campaign	Norway	Developed and implemented by the Information office for fruit and vegetables. To increase the intake of fruit and vegetables in schools, canteens and sport areas.	Meals regulation (schools)	Education (children)	2005- ongoing
FR	Removal of vending machines from schools	France	Vending machines ban	Meals regulation (schools)		Since 1 September 2005
IT	School catering guidelines	Lombardia region	Guidelines for school catering	Meals regulation (schools)		2002
FR	School Milk	France	The project consists in the free or discounted distribution of milk and certain milk products to pupils in schools and nurseries. In addition to the Community aid, the Government may add subsidies from national public funds. An additional fund is provided for organic products and milk and milk products for schools located in Priority Education Networks (REP), Priority Education Zones (ZEP) or Sensitive Urban Zones (ZUS).	Meals regulation (schools)		From 2001 to date
SE	Stopp, Stockholm obesity prevention project, Developed and implemented by Stockholm County council	Stockholm region	To assess whether a school-based prevention programme focused on reduced unhealthy eating and increased physical activity during school time over a four-year period could reduce the prevalence of overweight and obesity among 6 - 10 year old children. Also, to assess whether the intervention affected physical activity measured objectively by accelerometry and whether eating habits at home differed between control and intervention schools at the end of the intervention.	Meals regulation (schools)	Education (children)	2001-2005
NO	The Norwegian School fruit programme	Norway	The objective is to provide Norwegian schools with free fruit and vegetables.	Meals regulation (schools)	Education (children)	2001-ongoing
BE	Tutti Frutti - Fruit at School (Belgium, Flanders)	Belgium, Flanders	The project is characterized by periodical fruit supply and the promotion of health nutrition at school. The Tutti Frutti project was initially only developed for primary school children (TARGET GROUP). Since 2006, the project called Schoolsnakker, is developed for secondary school children.	Meals regulation (schools)	Education (children)	Start pilot study in schoolyear 2000-2001, Tutti Frutti since October 2004 in Flanders, with EU sponsorship since 2009

**Nutrition info on menus**

US	Nutrition information on Menus	State-level (nationwide with health reform)	Within the health reform there will be a requirement for calorie labeling on chain restaurant menus, menu boards, and drive-through displays, as well as on vending machines. The legislation applies to chains with 20 or more outlets, and requires them to provide additional nutrition information on request. Similar measures are already in effect or are awaiting implementation in California, Maine, Massachusetts, New Jersey, Oregon, New York City, Philadelphia, and a dozen other localities.	Nutrition info on menus		Implemented in some states since 2009
<b>Nutrition standards</b>						
PL	The National Programme for the Elimination of Iodine Deficiency (Program eliminacji niedoboru jodu w Polsce)	Poland	In the face of a significant level of iodine deficiency in Poland the Minister of Health issued a regulation on mandatory iodization of household salt in 1996. In 1998 the Ministry of Health adopted the National Programme for the Elimination of Iodine Deficiency for the years 1999-2003. Due to the nature of the iodine deficiency the main objective of the programme was to eliminate the iodine deficiency on the population level, and especially in risk groups: in pregnant women, neonates, children and adolescents. An interruption in financing of the Programme for the Elimination of Iodine Deficiency within years 2003-2005 caused a dangerous gap in the endemic goitre control system in school children and pregnant women and made it impossible to collect data on the level of the main iodine carrier – household salt – consumption and to control the salt iodisation quality and the incidence of thyroid neoplasm – especially in women. In 2006 the next edition of the Programme for the Elimination of Iodine Deficiency in Poland for the years 2006-2008 was approved.	Nutrition standards		1999-2003, 2006-2011

DK	Ban on trans fat	Denmark	took effect on 1st January 2004 making it illegal for any food to contain more than 2 percent trans fats	Nutrition standard		Since 2004
<b>Other policies not explicitly targeted at healthy eating but relevant</b>						
PL	Act on Commercial Quality of Agricultural and Food Products (Official Journal No. 5, item 44 with amendments)	Poland	The main objective of the law is protecting consumers and producers by assuring access to reliable information about the “commercial quality” of agricultural and food products. “Commercial quality” includes all those characteristics (organoleptic, physical-chemical, microbiological properties, size, packaging, presentation and labelling) not covered by hygiene, veterinary or phytosanitary requirements.	Relevant policy non targeted at healthy eating		effective from 21 of december 2000, amendments in 2005
PL	Act on tax on goods and services (Journal of Laws of 2004, No. 54, item.535)	Poland	The basic rate of tax on goods and services is 22%. 7% on goods relating to farming and forestry, health, food products and some services.3% on goods in the form of low-processed food products, agriculture, livestock, horticulture, orchard, forest, meadow, water and fish and fertilizers.	Relevant policy non targeted at healthy eating		effective from 11 of March 2004 amentments in 2005,2006,2007,2008,2009
PL	Act on the health conditions of food and nutrition	Poland	The Act regulates the safety requirements for food (for manufacturers and distributors), the types of foods and their purpose (which should be expressed on the label), the official food control authorities and their power of inspection, the principle of liability for damages.	Relevant policy non targeted at healthy eating		effective from 2001, amentments in 2006.
UK	Value Added Tax Policy in the UK	England	Zero rate for foods, full rate for confectionery, snacks, sodas	Relevant policy non targeted at healthy eating		Since 1979

## Appendix 2

A comprehensive review of policy actions and existing evaluations throughout Europe



Grant agreement no.: 226713

## **Work Package 1**

Benchmarking nutrition policies in Europe, their evaluation and identification of successes and failures

# **A comprehensive review of policy actions and existing evaluations throughout Europe**

**Input to deliverable D1.1  
Milestone 1.4**

**Internal report**

Date due: Month 12  
Date finalized: Month 12

Main responsibility for this document: UGENT  
with input from AU, UREAD, INRAN, JUMC, UNIBO and EUFIC

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# EATWELL

## Work Package 1 Milestone 1.4

### 1. Abstract

**Introduction:** Policy interventions that influence food intake have seldom been formally evaluated. The objective of this work is to revise which interventions have been evaluated in terms of awareness, consumption, health outcomes and cost/benefit analysis.

**Methodology:** Relevant policies and national actions have been revised within EATWELL project. This report refers to availability of performance indicators of awareness, consumption, health and cost/benefit. Policy and actions were classified in eleven categories.

**Results:** From the 107 selected interventions, 22 had some evaluation of their impact in awareness or knowledge and 27 evaluated their impact on consumption. Further, 16 actions provided an evaluation of any health impact, although the indicators were not always comparable. Finally, only three actions had specifically measured any cost-benefit, while other four had insufficient data to assess. Public Information Campaigns are successful in increasing knowledge, create an intention to engage in desired behaviours, but somehow they fail to achieve actual behavioural change.

**Recommendations:** This study highlighted the need of developing harmonized and verifiable indicators for measuring success and comparing between countries. Furthermore, EU policies should provide a set of indicators that may be regularly collected in all countries.

### 2. Introduction

The objective of this report is to review evaluations of EU nutrition policy interventions with a view to determining what is presently known about which policies work and which do not. Selected indicators are “impact on awareness”, “impact on consumption”, “impact on health” and “cost-benefit analysis”.

In Europe, some previous studies described national prevalence of overweight and obesity, while other research activities addressed specific sub-population groups such as adults (EPIC<sup>38</sup>), older adults (EPIC-Elderly and **SENECA**<sup>39</sup>) and adolescents (HELENA<sup>40</sup>, AVENA<sup>41</sup>). Most of the surveys differ in data collection methodology, year of survey, age ranges and sample sizes. Therefore, direct comparison between countries or studies should be handled carefully<sup>42</sup>. **EPIC**, for example, surveyed adults between 50 to 64 y in 23 centres spread over 10 European countries.

Monitoring of food availability in Europe: what has been done so far

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<sup>38</sup> European Prospective Investigation into Cancer

<sup>39</sup> Survey in Europe on Nutrition and the Elderly: a Concerted Action

<sup>40</sup> Healthy Lifestyle in Europe by Nutrition in Adolescence

<sup>41</sup> Alimentación y valoración del estado nutricional de los adolescente españoles

<sup>42</sup> Lobstein T & Millstone E for the PorGrow research team (2007) Context for the PorGrow study: Europe’s obesity crisis. *Obesity Reviews* 8 (S2), 7-16

Weight gain over time can result from increased energy intake, decreased energy expenditure or both. Data on energy availability (FAO's Food Balance Sheets) suggest that for developed countries increased energy availability is sufficient to explain observed weight gain since the 1980s; and it is probable that declines in energy expenditure associated with the transition to a light manufacturing and service economy took place prior to the 1980s. However there is some controversy over this issue: in a number of countries (e.g. UK) energy intake estimated from household surveys has declined while energy availability has increased at national level<sup>43</sup>.

Household Budget Surveys (HBS) have been used hence to estimate food availability at household level in Europe<sup>44,45</sup>, and other countries<sup>46,47</sup>. The agreement levels between the information provided by HBS and the British National Food Survey (NFS) were further examined<sup>48</sup>. Marked differences were observed between HBS estimates and NFS actual intake data. No obvious reasons for the disparities in estimates were reported, since the methodological differences cannot provide a full explanation for such discrepancies. The implications of this disparity are very important for policy; it will be important to fully understand the reasons for data discrepancies.

The EU funded Data Food Networking (**DAFNE**) initiative started in the late 80's aiming at the exploitation of HBS data as a surveillance tool for food availability at household level. DAFNE is a collaborative effort between 24 European countries to compare the food habits of their populations and monitor overtime long term trends in food availability, through the creation of a regularly-updated food databank based on household budget surveys<sup>49,50,51</sup>. The translation of all these findings into national policies, is however very slow. In 2004 only 6 European Countries had a Nutrition Action Plan<sup>52</sup>.

The unification of Europe had, as a consequence, the narrowing of the differences in dietary patterns between countries. The different levels of fruit and vegetable consumption that were previously identified between Mediterranean and Northern European countries seem to be levelling out, particularly in relation to fruit consumption. Keeping their traditional food choices, Southern Europeans consume higher amounts of unprocessed red meat (fresh), while Central and Northern Europeans preferably consume meat products. Household availability of beverages (alcoholic and non-alcoholic) is generally higher among Central and Northern European populations<sup>53</sup>.

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<sup>43</sup> Mazzocchi, M., Traill, W.B. (2005). Nutrition, health and economic policies in Europe. *Food Economics - Acta Agriculturae Scandinavica, Section C*, 2:138-149

<sup>44</sup> *Public Health Nutr.* 2001 Oct;4(5B):1135-41

<sup>45</sup> *Eur J Clin Nutr.* 2006 Feb;60(2):181-90.

<sup>46</sup> *J Hum Nutr Diet.* 2000 Jun;13(3):197-204

<sup>47</sup> *Br J Nutr.* 2006 Mar;95(3):555-67.

<sup>48</sup> Paterakis SE and Nelson M (2003) A comparison between the National Food Survey and the Family Expenditure Survey food expenditure data. *Public Health Nutr* 6(9):571-580

<sup>49</sup> Lagiou and Trichopoulou, *Public Health Nutr.* 2001 Oct;4(5B):1135-41

<sup>50</sup> Rodrigues SS, de Almeida MD.(2001) Portuguese household food availability in 1990 and 1995. *Public Health Nutr.* 4(5B):1167-71.

<sup>51</sup> Trichopoulou, A. (2001) The DAFNE databank as a simple tool for nutrition policy. *DATA Food NETWORKING. Public Health Nutrition* 4: 1187-1198

<sup>52</sup> *Public Health Nutr.* 2005 May;8(3):266-74.

<sup>53</sup> Naska, A., et al.. (2006) Dietary patterns and their socio-demographic determinants in 10 European countries: data from the DAFNE databank. *Eur.J Clin.Nutr* 60: 181-190

The associations between diet and health are not solely through overweight and obesity—but mediated through diet’s composition and general lifestyle. The Food Standards Agency in the UK has calculated that 42000 lives could be saved through an increase in fruit and vegetable consumption to the 5-a-day target (from around 3.5 portions), 20,000 lives by reduced salt intake (from 9g to 6g), and 3,500 calories each from reducing saturated fat and sugar intakes to recommended levels.

### **3. Previous EU Studies Relevant for EATWELL**

In this section we present the most relevant and recent EU funded projects that are highly relevant for EATWELL since they are specifically linked to policy making and EU legislation. Other projects that may provide scientific support are presented in **Annex 2**.

#### **PorGrow<sup>54</sup>:**

The Policy Options for Responding to the Growing Challenge of Obesity Research Project provided a unique opportunity to develop a large-scale application of a semi-quantitative technique (Multi-Criteria-Mapping) for exploring interviewees’ views on options to tackle obesity. Nine European Countries participated (Cyprus, Finland, France, Greece, Hungary, Italy, Poland, Spain and the UK) and included at least 21 stakeholders in each country. The interviewed stakeholders were representatives of the farming industry, food processing co., catering chains, food retailers (large, small, healthy), consumer groups, government officials (health, finances), public health professionals, town & transport planners, life insurances, sport & fitness, school teachers, nutritionists, journalists, advertising industry, pharmaceutical industry, NGO’s and trade unions. The core options presented by PorGrow were further clustered into 1. Exercise and physical activity oriented measures; 2. Modification of the supply of or the demand of foodstuffs; 3. Information related initiatives; 4. Educational and research initiatives; 5 Technological innovation and 6. Institutional reforms<sup>55</sup>.

PorGrow finally reported that European policymakers need more information on policy responses to obesity that stakeholders judge effective and acceptable. Aggregating across all participants, a comprehensive portfolio of policy measures, integrated into a coherent programme, would be well-supported by broad coalitions of stakeholders. Those portfolios should include measures (i) to provide improved educations in schools and to the general adult population; (ii) measures to improve access to and incentives for physical activity; (iii) measures to improve information about both foods and physical activity and (iv) changes to the supply of and demand for foodstuffs. There was little support for fiscal measures and technological ‘fixes’; they were judged ineffective and unacceptable. Significant differences were found across European regions, and across different stakeholder perspectives, but not across genders. There is a strong case for improved monitoring of body mass index levels, dietary habits and physical activity.<sup>56</sup>

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<sup>54</sup> The aggregated and specific country reports were published as a Supplement Issue in Obesity Reviews Journal (2007) 8(Supplement2).

<sup>55</sup> Stirling A, Lobstein T and Millstone E (2007) Methodology for obtaining stakeholder assessments of obesity policy option in the PorGrow project. Obesity reviews 8(S2), 17-27

<sup>56</sup> Millstone & Lobstein (2007) The PorGrow project: overall cross-national results, comparisons and implications Obesity Reviews 8(S2): 29-36

## **HOPE Study<sup>57</sup>**

The HOPE project (Health Promotion through Obesity Prevention across Europe, <http://www.hopeproject.eu>), was financially supported by the European Commission. This project aimed to integrate and enrich knowledge on the determinants of obesity in the European Union, in order to provide relevant input to regional and national policies directed to fight against the obesity epidemic.

The results regarding School-based interventions promoting both physical activity and healthy eating in Europe suggest that combining educational and environmental components that focus on both sides of the energy balance give better and more relevant effects. Furthermore, computer-tailored personalized education in the classroom showed better results than a generic classroom curriculum. Environmental interventions might include organized physical activities during breaks, or before and after school; improved availability of physical activity opportunities in and around the school environment; increased physical education lesson time; improved availability or accessibility of healthy food options; and restricted availability and accessibility of unhealthy food options.

## **FLABEL (Food Labelling to Advance Better Education for Life)<sup>58</sup>**

Nutrition labels are potentially a major instrument for enabling consumers to make healthier food choices, but current insights into how nutrition labels are used by consumers in real-world shopping situations are limited, making the science-based formulation of new labelling policies and the evaluation of existing ones difficult.

The objectives of the FP7 project FLABEL (Food Labelling to Advance Better Education for Life) are to determine how food nutrition labelling can affect dietary choices, consumer habits and food-related health issues by developing and applying an interpretation framework incorporating both the label and other factors/influences. Based on this, guidelines will be developed on use of nutrition labelling for EU policy and the food industry, especially Small & Medium-sized Enterprises (SMEs), which will include recommendations for assessing the impact of ongoing and future legislative and voluntary food labelling schemes.

In addition to the creation of guidelines and best practice material, the following FLABEL outputs will be of particular relevance to the EATWELL consortium:

The FLABEL consortium has created a benchmark of consumer exposure to nutrition labels in different countries, identifying the major types of labels used, as well as the major differences between the different systems. This was done by mapping the existing labelling schemes in Europe (EU 27 and Turkey) and involved recording the information on more than 37,000 products in 5 product categories (breakfast cereals, soft drinks, biscuits, yoghurts, pre-packed fresh ready meals) in 84 retail stores across Europe. There is 85% penetration of nutrition labelling across Europe.

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<sup>57</sup> I. De Bourdeaudhuij, E. Van Cauwenberghe, H. Spittaels, J.-M. Oppert, C. Rostami, J. Brug, F. Van Lenthe, T. Lobstein and L. Maes (2010) School-based interventions promoting both physical activity and healthy eating in Europe: a systematic review within the HOPE project. *Obesity Reviews* (in press)

<sup>58</sup> <http://www.flabel.org/en/>

Interested to determine if there were any external factors that would likely influence consumers' use of nutrition labels, an assessment was made of Public Health Awareness Campaigns in the EU 27.

Nutrition labels will only have an effect on the population's health status if they actually affect purchases, and only to the extent that more healthy choices in one product category are not offset by less healthy choices in another category. Such effects should not only be investigated by consumer surveys, where answers are often subject to a social desirability bias, but also by analysing actual sales data. To this end, FLABEL researchers will use a combination of three types of data: sales data on the sales of specific products in supermarkets, product data containing information on product composition and on the label that the product carries, and personal data on characteristics of the individual shoppers. This will allow an analysis to be made on how the introduction of nutrition labels on food products, changes in the format of nutrition labels, and reformulations of products as mirrored in the label information affect product choices, shopping basket composition, and overall patterns of dietary intake.

FLABEL partners will derive implications for public policy in the area of food labelling and health claims and develop proposals for the assessment of the effect of existing or upcoming legislation. Furthermore, implications for industry on the use of nutrition information on food labels will be derived, taking into account effects on competitiveness. In addition to desk research, key informant interviews and workshop sessions will take place to ensure that the implications reflected in the final documents, accurately reflect the opinions of the broad stakeholder base.

#### **EURRECA European Recommendations Aligned<sup>59</sup>:**

EURRECA, financed by the European Union within the Sixth Framework Programme for Research and Technological Development (2007-2011), aims to develop and apply a framework for systematically setting and keeping up-to-date micronutrient recommendations. It is relevant for EATWELL since it shows how evidence based recommendations must be harmonised within Europe, and later proposed for their consideration as official policies and regulations at Community level. Differences in nutrient recommendations confuse consumers and pose difficulties for food producers who make products in more than country. There is a need to increase transparency, and a need for a common framework with agreed language and terminology to develop nutrient recommendations and to keep them up to date.

The aim of the programme is to provide evidence about the status and the requirements of selected nutrients, particularly micronutrients, for specific vulnerable population groups identified by the proposers (such as infants, children, adolescents, pregnant women, lactating women, post-menopausal women, elderly people, immigrants and/or low-income groups) in order to harmonise dietary recommendations Europe-wide. The results were presented in the British Journal of Nutrition, December 2009, issue 102.

#### **4. Methodology**

Data collection was collected systematically in most EU countries<sup>60</sup>. The objective of this work is to identify policies and actions at national level, which have been evaluated or which

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<sup>59</sup> <http://www.eurreca.org/everyone>

are potentially evaluable. Policies were classified in eleven categories for the purpose of this study. Impact indicators were previously agreed and referred to awareness, health, consumption and cost/benefit analysis. A major point is that our commitment in this project is to review policies, i.e., government action, strategy or regulation. Thus private sector, NGO and academia actions in nutrition are outside the scope of this WP unless part of a wider government action.

#### **4.1** *Scope for data collection*

Due to the overwhelming availability of small-scale studies and interventions, EATWELL had to set up limits to what to include or not in the revision. Some of these could even be considered to have a government involvement, broadly defined. We only want to consider policies that are national, regional or at least city-level in scope.

Therefore, a grid was developed for data collection in each country. **Table 1** shows the contents of the grid. Briefly, the grid included the description of the policy/action, its type according to a pre-determined list of options, its expected outcomes in terms of health and behaviour, and a potential evaluation approach.

A larger policy (eg. five-a-day) may have a number of constituent elements (eg. information campaign, school meal changes). In this case, we tried to catalogue the constituent elements separately, hence the grid provided a column to indicate when specific actions were part of a larger policy umbrella or secondary options for classification. Furthermore, policy documents and actions only were to be included if associated with a healthy eating campaign.

#### **4.2** *Further cleansing of the grid*

In order to get information about evaluated actions, it was decided to remove from the grid all those documents containing only guidelines, general framework or “political intention” but without any further action as consequence. In many countries, policies remain as such since their implementation may be postponed or never executed. Hence, only actions that were related to specific policies were retained to perform the “evaluation of evaluations”.

#### **4.3** *Evaluation of evaluations*

Further information about the types of evaluations performed was necessary. More specifically, EATWELL focused on three main impact indicators: impact on awareness, impact on consumption, impact on health (often measured in terms of nutritional status) and cost-benefit analysis. In order to systematize data collection for a second grid was used, including only the retained 107 actions that provided any information on their evaluations. This second grid is presented in **Table 2**. Briefly, it specified whether actions were evaluated in terms of their impact on awareness, food consumption, health (independently of the indicator used) and whether any information was available on implementation costs, budget or

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<sup>60</sup> In **Annex 3** a national report from Bulgaria which was sent apart and did not follow the standardized methodology

desirably cost-benefit analysis performed. In some cases, EATWELL researchers (e.g. Dr. D'Addesa) performed additional analyses to existing datasets, in order to enrich results.

The objective of this grid is to develop a framework for policy evaluation based around the 3-stage procedure: (i) impact of intervention on attitudes, Behaviour and consumption; (ii) impact on obesity and health; (iii) cost-effectiveness and cost-utility analysis. It will judge the quality and completeness of such evaluations and look across countries to draw preliminary conclusions about what interventions work and what ones don't and for what ones information is too incomplete.

Furthermore, for the purpose of EATWELL reporting, the following classification of interventions will be followed: (1) Tax/subsidy on foods; (2) Subsidies (e.g. vouchers) to disadvantaged consumers targeted at buying healthy foods; (3) Advertising controls; (4) Public information campaign; (5) Nutritional education; (6) Regulation of school meals (including vending machine bans and provision of free fruit and vegetables) or workplace canteen meals; (7) Nutritional labelling; (8) Nutritional information on menus; (9) Nutrition-related standards (e.g. limits on fat/sugar/trans-fat content for certain foods, regulating portion sizes, etc.); (10) Government action to encourage/coerce private sector action without formal regulation (e.g. reformulation to reduce salt, sugar, trans and saturated fats in processed foods); and (11) Policy interventions not explicitly targeted at healthy eating but relevant (e.g. agricultural policy, VAT, etc.).

Evaluations of such types of interventions will be presented in terms of their impact (or lack thereof) on awareness, consumption, health and in terms of cost/benefit analysis.

**Table 1: Description of the grid for data collection**

EXCEL-COLUMNS	EXPLANATION
<b>EU Country Code:</b>	Use the national country code of the country where the policy has been applied. Eg. BE for Belgium <sup>61</sup>
<b>ID:</b>	This is a unique number assigned to each intervention included. It starts from one and adds automatically. In this way combining previous field with present one will allow us to build a unique code for each intervention (e.g. BE 17).
<b>Name of the Intervention:</b>	Provide the complete title or name of the intervention. The names will be mentioned in English and in the language of the corresponding country.
<b>Country, region or city:</b>	Provide the country, region or city where the policy or public funded intervention took or takes place.
<b>Description:</b>	Provide a complete summary of what the policy is all about. Include objectives and expected (measurable) outcomes. Since the number of relevant policies in any country will be quite small, it would be helpful to include 2 or 3 paragraphs here describing the measures, population targets, objectives, dates, expenditure if available and relevant.
<b>Type of Intervention, Type of Intervention (2), and Type of Intervention (3):</b>	Select from the possible choices in the menu. There are three columns, and you may choose the three most appropriate descriptors. Several options are pre-developed, select one of the following options: <ul style="list-style-type: none"> <li>- Tax/subsidy (excluding differential VAT rates)</li> <li>- Advertising regulation (excluding health claims)</li> <li>- Public information campaign (e.g. to promote fruit and veg consumption, reduce salt intake)</li> <li>- Education intervention</li> <li>- Regulate school / canteen meals (including vending machine bans)</li> <li>- Nutritional labelling</li> <li>- Health claim regulation</li> <li>- Nutritional information on menus</li> <li>- Liability laws</li> <li>- Food standards</li> <li>- Accessibility measures for disadvantaged consumers</li> <li>- Government action to encourage/coerce private sector action <i>without</i> formal regulation (e.g. reformulation to reduce salt, sugar, trans and saturated fats in processed foods)</li> <li>- Policy intervention not explicitly targeted at healthy eating but relevant (e.g. agricultural policy, VAT regulations, etc.)</li> <li>- Other, select this if none of the other options is appropriate.</li> </ul>
<b>Length-Duration:</b>	Provide the time span from the beginning to the end of the policy.
<b>Expected attitude and/or knowledge change:</b>	Select one of the options provided in the menu: <ul style="list-style-type: none"> <li>- Improve nutritional knowledge (e.g. awareness of health benefits of 5-a-day)</li> <li>- Improve attitudes to healthy eating</li> </ul>
<b>Expected Behavioural Change:</b>	Select one of the options provided in the menu <ul style="list-style-type: none"> <li>- Increase physical activity</li> <li>- Improve diet quality</li> <li>- Reduce calorie intake</li> <li>- Other</li> </ul>
<b>Potential Public Health Benefit:</b>	Select from the options available: <ul style="list-style-type: none"> <li>- Lower obesity/overweight levels</li> <li>- Reduce cancer incidence</li> <li>- Reduce diabetes levels</li> <li>- Lower levels of cardiovascular disease</li> <li>- Other</li> </ul>
<b>Evaluation Approach:</b>	Provide a description of any evaluation (including findings) that has been undertaken, either by the government agency itself or by others (e.g. academics). Indicate the outcome, the methods (e.g. cost-benefit analysis), data used, e.g.: <ul style="list-style-type: none"> <li>- QUALITATIVE - Qualitative/descriptive evaluation (e.g. based on non-structured interviews, focus groups, etc.)</li> <li>- PILOT - Pilot study (smaller scale than the actual intervention)</li> <li>- PRIMARY - ad-hoc primary data collected (excluding controlled trial, includes sample surveys and censuses on the target population)</li> <li>- SECONDARY - Based on secondary data (indirect evaluations using official sources such as household survey data, health survey data, model-based evaluations, etc.)</li> <li>- EXPERIMENTAL - Controlled trial\experimental methods (i.e. a control group is selected according to statistical criteria)</li> </ul>
<b>Type of Secondary Data if any:</b>	Provide a description of which types of data are available with potential to be used for

<sup>61</sup> Country Codes can for example be found on: [www.xs4all.nl/~wjsn/tekst/europe.htm](http://www.xs4all.nl/~wjsn/tekst/europe.htm)

	evaluation within EATWELL, e.g. <ul style="list-style-type: none"> <li>- Cross-sectional (data from a survey carried out once)</li> <li>- Repeated cross-sections (repeated surveys of different individuals, with same methodology)</li> <li>- Panel data (Repeated surveys on the same individuals)</li> <li>- Cohort study (Follow-up longitudinal studies)</li> <li>- Retail scan data (Supermarkets)</li> </ul>
<b>Is the Policy document in File?:</b>	Select yes if EATWELL has access to either the hard copy or the electronic version of the policy document. It refers to having full physical (or electronic) access to the document.
<b>Reference:</b>	Provide the internet link and references to any relevant publications.

**Table 2:** Evaluation of evaluations grid

<b>Column</b>	<b>Explanation</b>
ID	The identification code with country and number
Name	Full name of the intervention and its translation to English (when applicable)
Description	Brief description of the action and its relation to healthy eating
Date	Implementation period
Evaluation	Whether it was done, planned and available
Impact on awareness	Report on plausible indicators of awareness
Impact on consumption	Registered actual changes in food consumption by the targeted population
Impact on health	Relates to the impact in terms of e.g. reduction of cardiovascular mortality, longevity, nutritional status, risk factor for health.
Cost/benefit analysis	Provide costs and if possible results of cost/benefit analysis.
Success factors	Researcher's assessment of main success (or failure when appropriate) factors related to this particular action
Links	Links to actual source of information

#### 4.1 Assessment of evaluations

Evaluating performance of interventions is not straightforward. The absence of clear indicators, or at least harmonised ones, hinders any direct comparison between countries or between actions. As example, the multi-sector communication and nutrition education program *Cultura Che Nutre* in Italy, helps to illustrate how varied “success” indicators are. The program was promoted by the Ministry of Agriculture (MIPAAF), the Italian Regions (leading Region Emilia Romagna), in collaboration with the Ministry of Education and National Institute for Research on Food and Nutrition (INRAN). Although its main objectives were very clear<sup>62</sup>, no specific impact measurements were taken. Furthermore, the Ministry of Agriculture confirmed that **there had been no scientific measurement of impact**, however they considered a **good result** the **number of teacher tools and books** for pupils **requested** and totally **distributed** in the years (500.000 copies) and the **number** (170.000 classrooms of primary schools enrolled each year (from 2003 to 2009 ) in the competition "What's the taste"<sup>63</sup>.

In order to make a systematic presentation of available evaluation, and following EATWELL's first data collection strategy, evaluations will be presented according to their generic type, and focusing the availability of evaluation in terms of the impact interventions had on **awareness, consumption, health** and whether any **cost-benefit** analysis was performed.

Figure 1 shows the distribution of evaluation of impact according to the aforementioned indicators. From the 107 selected interventions, the majority (36%) did not have any evaluation on the basis of the selected indicators. Awareness was evaluated in 21% of the actions. The measurements of changes differ methodologically between countries and type of interventions. Some indicators refer to ‘remembering slogans of a campaign’, to increased knowledge of what healthy eating is, and in some cases to claims of behavioural change. However, comparability is hindered by the lack of uniform measures and hence of objective assessment.

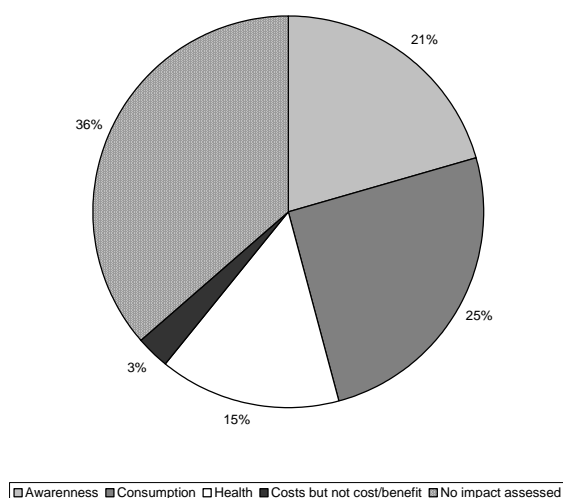
Seventy-five percent (n=80) of revised actions did not report changes in consumption, or at least did not include specific food consumption as indicators of intervention outcome. As with awareness, comparability of data is hindered by un-harmonized indicators. Some indicators refer to increased fruit and/or vegetables consumption, often in proportions or in quantities; other indicators refer to intake levels of specific nutrients such as iodine, cholesterol, saturated fat, total fat and fibre. Since many EU initiatives and school breakfasts are about milk, some actions have been evaluated in terms of milk and dairy products consumption. Snacking and breakfast (consumption or skipping) have also been used as measures of impact in consumption. Finally, lifestyle changes or a combination of lifestyle factors have also been used in reports about impact in consumption.

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<sup>62</sup> Objectives are the promotion of a balanced and healthy nutrition, to develop awareness about correct food consumption and disseminate knowledge about the national agro-food system

<sup>63</sup> D. D'Addesa (INRAN) believes that the success of this national multidisciplinary intervention is related to the adoption for the first time of an homogenous and scientifically correct methodology and educational tools at national level. Before this initiative the methodology adopted was heterogeneous and often wrong.

Figure 4. Evaluation of impact



Only 15 percent of the interventions (n=16) did an impact assessment on health. The most common way to evaluate the impact on health is to look at obesity levels before and after the intervention if an evaluation was done. The French EPODE and FLVS projects, the Italian Cultura Che Nutre and Contratto della Merenda, the Stockholm obesity prevention project in Sweden and The VIASANO project in Belgium all looked at the prevalence of obesity among the children who participated in their programs. Main indicators for health evaluation have been prevalence levels of overweight and obesity, derived from Body-Mass-Index (BMI). In some cases indirect measures such as increased fruit consumption have been reported as indicator of health impact. In North Karelia, the main public health related indicators were related to CVD mortality reduction.

Reporting on the cost of interventions was given for three of the selected evaluations (2.8%), and it might be available for EPODE and FLVS. In four cases (3.7%) some further information could exist, but it was not available for EATWELL partners. Therefore, availability of general budgets does not imply any cost/benefit analysis.

## 5. Evaluations according to type of intervention

Revised actions/policies in EU countries that could be classified within the following categories: Tax/subsidy on foods; Subsidies (e.g. vouchers) to disadvantaged consumers targeted at buying healthy foods; Advertising controls; Nutritional labelling; Nutritional information on menus; did not provide any useful information on the performance indicators.

### 5.1 *Public information campaigns*

An intervention was classified as “Public information campaign” if it had the aim of improving individual and social knowledge about health issues connected to food habits,

making use of mass media like newspapers, TV, etc., and directed to any kind of target population.

A very good example of the few evaluated interventions is UK's Eat Well to keep well campaign in 1998. It consisted of TV spots involving well known figures. The intervention was evaluated in a sample of 602 people (older than 16y). As result, 71% of respondents were **aware** of healthy eating advertising, and over 52% recognised the 'Eat well to keep well' campaign specifically. Over 80% had seen or heard advertising relating to fruit and vegetables and 69% of these said the advertising had increase their healthful behaviour.

Also in UK, "Five a Day" campaign was evaluated by The Big Lottery Fund in 2006. Overall, this evaluation has found that there have been greater levels of improvement in **awareness** and understanding of the issues and implications of eating fruit and vegetables than in overall consumptions levels (**knowledge**). Twenty four per cent of the surveyed individuals reported increased consumption of fruit and vegetables in the previous six weeks (**consumption**). In UK, the five-a-day campaign was also evaluated by EPIC's "Pilot Evaluation": Results suggest that the campaign had a positive effect in people with the lowest intakes – this is important for addressing inequalities in health. Those who ate less than five a day at baseline increased their intakes by 1 portion over the course of the study. A recent report<sup>64</sup> found that consumption data show a slight increase for fruit consumption; it seems that the campaign outcomes were stronger for the quantities of vegetables intake, especially over the first two years.

Six-a-day is the Danish equivalent to the British 5-a-day campaign. Six-a-day was initiated in 1999 and is a private-public partnership – its main partners being The Danish Cancer Society, Directorate of food and the producers of fruit and vegetables. On basis of scientific research the Danish recommendations were 6 pieces or 600 g of fruit or vegetables a day, unlike other European countries where the recommendation was 5. The reason for this choice was the similarity between the number 6 and intercourse, which should make it easier for – especially men – to remember the campaign. However, in recent years this part of the message has been played drastically down. Six-a-day 6 a day has been a major success and within this "mother-campaign" a huge number of minor campaigns have been carried out. As these campaigns differ a lot between each other, which makes it rather difficult to evaluate overall performance of the campaign. Nevertheless, the campaign reported that 84% of respondents was aware of the 6 a day campaign in 2007, and that the daily intake of fruits and vegetables in the same year was 3.42 compared to 2.87 1998 (highest 3.79 in 2002). It could be also attributable to his campaign the increase in companies providing their employees with free fruit between 2001 and 2003: 700% (a total of 4986 workplaces, 10% being public).

In Portugal the Progama Peso Comunitario, inscribed with the Platform against obesity, reported a reduction in total calories intake (-6.3%), cholesterol (-9.2%), total fat (-12.2%) and saturated fat (-15.6%) between the baseline and follow-up surveys. The program also reported a desirable increase in 7.6% of fibre consumption in the same population. The Portuguese programa Educativo "apetece-me"- also within the Platform against obesity had an impact on behaviours, in particular on food habits as reported after quantitative (through questionnaires) and qualitative (through working groups with teachers and pupils) evaluation. However, no objectively verifiable data was available.

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<sup>64</sup> Capacci and Mazzocchi, 2009

“Eat well, live healthy” campaign was executed between 2003 and 2005 in Italy. It was a campaign promoted by the Italian Ministry of Health, targeting the general population and the youth. Main objectives were to encourage healthy lifestyle including a balanced diet with particular emphasis on Mediterranean diet; and a more active lifestyle. The campaign's evaluation showed that people knew the content of the campaign and considered the objectives as beneficial<sup>65</sup>. Reported impact of the campaign on the Italian population was considered satisfactory since 37.8% respondents in the evaluation survey declared having improved their dietary habits as consequence of the campaign.

Also in Italy the "Feast of the colours of life, the 5 colours of wellness" was evaluated at two points in time (Winter 2005-2006 and Winter 2006-2007). As result, 77% of consumers who had seen the nutritional messages correctly remembered after more than 10 days, the name and content of the campaign and 56% of those who stated to consume less than 5 servings of fruits and vegetables a day, were willing to increase their consumption, as direct consequence of the information received.

In Poland some campaigns focused specifically on milk. Mlekoślaw campaign revived the image of milk in a funny way highlighting its pro-health features. The target group were children aged 5-12 years and their mothers. Advertisement was remembered by 27% of mothers and 44% of children. Although attitudinal and awareness changes were reported due to Mlekoślaw, the campaign did not influence significantly actual consumption habits of Poles, and hence there was not a significant increase in milk consumption<sup>66</sup>. The campaign was conducted for too short, a campaign slogan (Dairy strengthen your bones and a sense of dignity) did not reach the children because it was too difficult for them, and general population apparently did not change any behaviour after the campaign. Also in Poland, "Bet for milk and dairy products" campaign evaluated that after its first part, 73.4% of mothers said that the campaign increased their level of knowledge about milk and milk products, 89.4% of children declared their knowledge of milk and milk products increased. Awareness of the information campaign “five servings of fruit, vegetables or juice” was also measured in Poland. It increased from 27% in 2008 to 41% in 2009 of women declaring knowing the campaign.

Mass campaigns such as French Campagne média du PNNS (PNNS media campaign) had as objective to stimulate passing to action. However, indicators used for the evaluation of the campaign were not related to action but to attitudes. Within the branch promoting fruit and vegetable consumption, the approval rating is significantly above the norm, the campaign was perceived as clear, credible and bringing new information. Young people felt strongly concerned by the subject and the campaign message has been judged clear and convincing. The branch dealing with physical activity has achieved a satisfactory impact, both in terms of big scores post-test and on the understanding and acceptance of its overall message. Finally, the campaign directed to reduction of fat and sugar consumption was evaluated as clear,

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<sup>65</sup> Moreover, EATWELL partners at INRAN believe that an education campaign should use different communication channels such as in this campaign. In particular when the campaign is addressed to young people, it should use technology channels, such as television, radio and banners on the main websites visited by young people to obtain their attention.

<sup>66</sup> M. Świątkowska. Reklama kategorii produktów, jako narzędzie wsparcia rozwoju sektora mleczarskiego w Polsce. Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu, 2009, 11 (3), 366-371. (English: M. Świątkowska. Advertising of product categories as a tool to support the development of dairy sector in Poland. Annals of the Association of Scientific Agricultural and Agribusiness Economists, 2009, 11 (3), 366-371.)

relevant, persuasive, with right tone and useful suggested alternative and it has generated a large involvement with a strong incentive.

The general consensus in the field of population health is that the four generations of population-level coronary heart disease (CHD) prevention interventions have had only modest impacts on the prevalence of CHD risk factors as measured at the level of the community<sup>67</sup>. Conflicting findings were observed as result of the EATWELL exercise. On the one hand, e.g. North Karelia program suggests that “change in actual behaviour is possible”<sup>68</sup> resulting in improved health and longer life expectancy at population level. On the other hand, some interventions like UK’s “5-a-day” or Italian “Fruit-Snack campaign” showed no substantial increase in actual fruits and vegetables consumption. Probably different settings and the length of the interventions may be potential confounding factors.

## 5.2 *Regulation of schools'/canteens' meals*

For the purposes of EATWELL reporting the category “regulation of school/canteen meals” include any regulation of food supplied at school and work canteens. This category includes health standards for canteens and school shops as well as rules on vending machines placed in schools. The distribution of fruit or other healthy snacks to schoolchildren was included Under this category.

The Tutti Frutti program in Belgium for example presents a promising case where many success variables were taken into consideration. Their main comparison is between the quantities of fruit versus the quantity of unhealthy snacks eaten at school for different age categories, hence **consumption**. Their evaluation was in particular interested in the effect of the intervention after 1 year and 2 years or more. The evaluation was included general fruit **consumption** by students, their attitude in regard to fruit, the social norms in regard to fruit and the knowledge of pupils on fruit. The effect of the intervention has been measured by using two intervention groups (one group of pupils participating one year and one group of pupils participating for two or more years) and one control group (group of pupils that never participated in the project). Their conclusion was that a combination of different strategies is a necessity: besides offering supply of fruit, health-education and structural measures are needed.

In Italy, Fresh break - Fruit Snack programme installed vending machines for fruit, vegetables and yoghurt, with a 100% acceptance level among the participating children. Such success can partially be explained by the involvement of participants (they appropriated themselves of the intervention) exemplified with their request to provide other food items through vending machines. In the same vein, combining messages about healthy eating and increased physical activity, “Aware break: Nutrivending” is an Italian intervention to promote a healthy lifestyle through a higher healthy snacks consumption and a regular physical activity. They use vending machines as a “way” to benefit of healthy food habits and to disseminate information about the importance of physical activity. The first evaluation only in the schools (2006/2007) showed an increase of healthy snacks consumption of 21%. In 2008 the average increase of

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<sup>67</sup> Papadakis S & Moroz I, Population-level interventions for coronary heart disease prevention: what have we learned since the North Karelia project? *Current Opinion in Cardiology* 2008, 23:452–461

<sup>68</sup> *Ann Nutr Metab* 2009;54(suppl 1):33–38

healthy snacks consumption distributed through all the vending machines was 16%, therefore suggesting a relatively steady desirable behaviour.

The Italian program Eating Together reported changes in dietary patterns that could be attributed to the intervention. A desirable increase of yoghurt consumption as a snack: (60% vs. 47% among children of kindergarten and 38% vs. 30% among primary school children ). Fruit consumption as a snack in the morning among children of middle school increased (6.5% vs. 3.6%); fruit consumption in general increased also among adolescents (17% vs. 4%), while sweet beverages decreased (3.3 vs. 9.6).

In Northern Countries, as result of promotion of healthy eating and lifestyle, an increase of 10-15% was observed in the number of pupils eating their lunch in the canteen (Norway's Physical activity and meals in schools program) or 15-29% increase of fruit consumption in sports centres (Denmark's Food in Motion program). School fruit in the Danish region Funen consisted of giving school attending children free fruits and after a trial period, offer them a paid agreement. Up to 86% of pupils registered for the paid agreement suggesting acceptance and engagement with the program. Vegetables and fruits intake levels were however not significantly different from the levels observed in other communities. Danish National school fruit program provides also a trial period with free fruit, and afterwards schools should express their engagement and continue the agreement, on paid basis. In general, 98% of schools were satisfied with the agreement. In 2008 85% of schools wanted to continue with the agreement, which is 10% higher than 2007.

In Poland, as result of the "5 servings of vegetables, fruit or juice" (5 porcji warzyw, owoców lub soku) initiative, there has been a marked increase in juice consumption by children in comparison with the measurement of December 2008: from 19% to 30% (declared consumption, ad hoc study).

Tutti Frutti at school in Belgium showed that after two years intervention students in the intervention group would bring fruits as snack more frequently than those in the control. There was an overall increased consumption and students reported having the intention of eating more fruits<sup>69</sup>. Regional Italian Fresh-Break-Fruit-Snack initiative reported that at the end of the project about 270.000 healthy snacks were consumed. Before the project no healthy snacks were consumed.

Italian Contratto della merenda (Snack agreement) consisted in provision of free healthful snacks at school, with a contract with the parents to support the action also at home. The project performed an evaluation with anthropometric measurements before and after the intervention. After participation in snack-contract (IT), children's appreciation for fruit increased during the first school year in the classes where the teachers developed initiatives to support the intervention. Fruit juice appreciation was over 70% only in the first three grades. The analysis of the baseline anthropometric data revealed that 20% of the boys and 15% of the girls were overweight while 15% and 17% respectively were obese. As expected, given the short time interval, repeated measurements a year later showed no significant changes. Similarly, the evaluation Cultura Che Nutre's (Feeding culture's) health impact, measured in terms of nutritional status, revealed that the prevalence of overweight/obesity at national level

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<sup>69</sup> [http://www.logowvl.be/site/upload/2007\\_07\\_04\\_1042\\_Effectevaluatie.pdf](http://www.logowvl.be/site/upload/2007_07_04_1042_Effectevaluatie.pdf)

among 8-10 years old children stagnated with a non significant increase of 0.9% points in prevalence levels (from 35.0 % in 2002 to 35.9% in 2008)<sup>70</sup>.

In Poland, there has been a marked increase in juice consumption by children in comparison with the measurement of December 2008: from 19% to 30% attributable to the campaign "5 servings of vegetables, fruit or juice" (5 porcji warzyw, owoców lub soku).

Another comprehensive intervention was Fuel Zone in Glasgow UK. Fuel Zone included a) the refurbishment of secondary schools dining halls to create vibrant, colourful environments that offered menus to suit the tastes of Glasgow's young people; and b) promotion of healthy eating. The comprehensive intervention comprised the introduction of a new healthy menu range, tariff incentives for healthier food items and a range of health promotion initiatives. The intervention used web based points reward scheme administered via cashless system which further promoted the uptake of healthy options. As result of the intervention, healthy food intake by pupils that was 39% before Fuel Zone, increased to 74% in 2004.

In Poland, "The school milk program" Mleko w szkołach also measured changes in actual intake. In 2009 in over 14 thousand schools milk and its products had already been consumed by 2.4 million children and youth. With the support of the School Milk Program subsidy over 366 million of "glasses of milk" has been consumed by pupils in Poland since 2004. Furthermore, the program achieved a 276% growth in number of participating schools (from 4353 in 2004/2005 school year to 12009 in 2007/2008). The number of pupils participating in the Program 2007/2008 presents 178% growth in comparison to the previous school year.

In Italy, "Eating together" initiative reported an increase of 14% points in the consumption of yoghurt as snack in kindergarten children and of 7 percent point in school attending children. Following Snack-Contract, yogurt showed a slight decrease in consumption among children in the 4<sup>th</sup> and 5<sup>th</sup> grades group. "Lait scolaire" in France (which was the base for the EU School Milk Programme launched in 2008) reported that expenditures of the programme relates to near 10 302 tons of cheese and 27.722 million litres of milk<sup>71</sup>. For almost ten years the installation of milk fountains in the canteens of colleges and high schools has been encouraged. Today, more than 1700 machine have been installed, with the positive result that 33% of teenagers drink a glass of milk in school each day.

The PERSEO program in Spain promotes healthy eating and physical activity in children. They implement their program in 34 schools versus a control group of 33 schools. The targeted schools are all public schools and a large number are located in low socio-economic districts. They have reported a 20% prevalence of obesity in boys and 15% in girls, and foreseen evaluation in the forthcoming years<sup>72</sup>.

### **5.3 Nutrition Education Programmes**

For the purposes of EATWELL reporting "nutrition education" was defined as any action involving schools (i.e. pupils, teachers, or school officers) and any other intervention that

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<sup>70</sup> The impact on health was evaluated at INRAN by D. D'Addesa for EATWELL. The data utilized were those of INRAN (Manuale di Sorveglianza Nutrizionale. INRAN 2003. Roma. pp. 105-133) and those of ISS 2008 "OKkio alla salute" surveillance project results.

<sup>71</sup> [http://ec.europa.eu/agriculture/drinkitup/index\\_en.htm](http://ec.europa.eu/agriculture/drinkitup/index_en.htm)

<sup>72</sup> [http://www.aesan.msps.es/AESAN/web/notas\\_prensa/ninos\\_comen\\_grasas.shtml](http://www.aesan.msps.es/AESAN/web/notas_prensa/ninos_comen_grasas.shtml)

used typical educational tools (e.g. training, seminars, lectures) independently of the age of the target population.

Skipping breakfast<sup>73,74</sup> and snacking<sup>75</sup> could be mentioned among food intake patterns related to obesity and overweight. Breakfast skipping is associated to lower cognitive and academic performance<sup>76</sup>. Eating between meals or snacking has become the source of at least 25% of total energy intake in different EU settings and it provides more than the recommended quantities of added sugars and saturated fatty acids<sup>77</sup>. Hence some strategies have been specifically directed to the promotion of healthy breakfast and snacking. There is increased interest in examining the relationship between dietary patterns and other factors such as chronic disease, overall nutrient quality and demographic variables, since dietary patterns summarize complex dietary data into more practical, meaningful information<sup>78</sup>.

Danish “All about Diet” Program includes 2 WebPages providing Danish citizens and children with information, a hotline, and a "rejsehold" - a mobile task force - helping communes, schools and institutions improving healthy food. Within this broad intervention several campaigns and education interventions been established. As result, 51% of evaluated task-force visits found a policy of school food. Furthermore, 39% of all participants have now school food and 96% of all participants are satisfied with the program.

In Italy, Fruta Snack (fruit snack intervention) 67% of the students involved in the project, stated that their nutritional knowledge about the importance of fruit and vegetables consumption was improved. Seventy-two percent of children who participated in the Healthy eating for your child program **knew** more about organic food and liked school lunch prepared with organic food.

The program “Nutritional education: an integrated intervention” was a regional intervention in Lombardy, Italy. It included schools, families and paediatricians. The evaluation reported that the proportion of children reporting snack consumption (not fruit) at school was 16% among children involved in the project and receiving fruits at school, while it reached 76% among control children (not participating to the project and not receiving fruit at school). Moreover the demands for changing school lunch menu for various personal motivations had been reduced from 5.6% to 3.5%. Through an interview with parents, it was further clarified that 65% of requested changes were due to problems of taste or food habits and not to detected pathologies.

From questionnaires administered to children, it emerges that after the Regional project for nutritional surveillance and education in schools (Italy), a greater number of children have breakfast every day (pre-intervention 71% - post-intervention 72%); the proportion of children who had healthful snacks 1-2 times a day was risen (pre-intervention 1 time 15.2% - post-intervention 16.6%; pre-intervention 2 times 60.5% - post-intervention 62%), while the proportion of those who had unhealthy snacks more than 3 times a day was reduced (pre-intervention 16% - post-intervention 12); the proportion of children who never ate the

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<sup>73</sup> Nutr Hosp. 2006;21(3):346-352

<sup>74</sup> Nutr Hosp. 2008;23(4):383-387

<sup>75</sup> European Journal of Clinical Nutrition 2009; 63:1297–1304; doi:10.1038/ejcn.2009.87

<sup>76</sup> Pollit E, Mathews. Breakfast and cognition: an integrative summary. Am J Clin Nutr 1998; 67(4):804s-812s.

<sup>77</sup> Macdiarmid, Loe, Craig, Masson, Holmes and McNeill. Meal and snacking patterns of school-aged children in Scotland. European Journal of Clinical Nutrition 2009; 63:1297–1304

<sup>78</sup> British Journal of Nutrition 2005; 93:943–949

following food items decreased by 3.7% for legumes and fish, by 4.4% for vegetables and by 0.9% for fruit.

#### **5.4 *Advertisement regulations***

For the purposes of EATWELL, this category covers all regulations directed to ban advertising of unhealthy foods to different segments of the population, particularly children.

In 2007, the UK communications regulator, OFCOM (formerly Independent Television Commission) introduced a series of rules prohibiting the advertisement of foods high in fat, salt and sugar (HFSS) during children's programmes. The intervention was evaluated, although mostly in terms of children's exposure to advertising messages on TV. The evaluation of the ban concluded that children aged 4-9 saw 39 percent less advertisement of unhealthy food, while children aged 10-15 saw 28 per cent less advertisement compared to the same period before the ban was implemented.

#### **5.5 *Nutrition-related standards***

The only example of a nutrition-related standard is the recent Danish ban on trans fats. This hasn't been formally evaluated.

#### **5.6 *Generic policies***

This category includes all other government induced actions not classified under other headings or with multiple measures, and which are relevant to food consumption.

A classic example is the Finnish North Karelia Program. It was launched in Finland with the aim to tackle the high cardio-vascular mortality that occurred in the years 1970's. The Program included specific dietary changes like reduction of saturated fat consumption and increase in the consumption of unsaturated fat, fruits and vegetables. This comprehensive action included educational programs, actions via health services and schools and multi-sector collaboration (NGO's and private sector<sup>79</sup>). The action was further implemented in the whole country. As result e.g. butter **consumption** fell from 90% in the 70's to 5% by 2000 as main bread spread, while the use of vegetable oils increased from zero to reach 50% of the population. Fruit and vegetable consumption has increased and salt intake diminished. Of course these changes cannot be solely attributable to the Program as similar changes took place in other countries. Finland observed substantial reduction in blood cholesterol and blood pressure, but obesity prevalence continued to rise (**health indicators**). Moreover, the reduction in smoking among men together with the lower cholesterol and blood pressure levels, had as result 80% reduction in the yearly CVD mortality rate and about 10y increase in life expectancy (**health indicators**). These changes have been attributed to the Program, but again similar changes have been observed in other countries, so this does not represent a true scientific evaluation.

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<sup>79</sup> Worksites and national community organizations were also involved, while legislation and public policy supported the whole action.

In France a pilot “healthy city” program started in the northern municipalities of Fleurbaix and La Ventie (FLVS). This action had as main characteristic the involvement of as many stakeholders as possible, from civil servants to families, from schools to chain supermarkets and industry. Compared to children from the control towns, Fleurbaix and Laventie children have a better nutritional knowledge. Families in Fleurbaix and Laventie whose children have received nutritional information have changed their lifestyle habits towards current nutritional recommendations.

During the first period of the FLVS study (from 1992 to 2000) the prevalence of childhood overweight and obesity first tended to increase. During the second period (from 2000 to 2004), the prevalence of childhood overweight and obesity decreased in Fleurbaix and Laventie whereas it increased in the comparison towns. EPODE has registered heights and weights systematically, and found improvements in the body mass index (BMI) of children involved in the program (2 age groups: 5 to 6 and 10 to 11) with an overall decrease in the prevalence of overweight including obesity of 1.88% in 2005/2007<sup>80</sup>.

An action plan "Food and Well Being – reducing inequalities through a nutrition strategy for Wales" was launched in 2003 with an emphasis on addressing food poverty and the promotion of food equality through improving physical and economic access to food and support for community action, to meet the needs of most vulnerable groups. Since Food and Well Being began, 41% of adults reported in 2003-5 that they ate five or more portions of fruits and vegetables a day, and only 7% that they had eaten less than a portion or none the previous day (FSA-Wales)<sup>81</sup>.

Portuguese Progama Peso Comunitario within the frame of the Platform against obesity showed promising results. Weight loss after the program has been registered: 46% of people with a BMI>30 lost weight with respect to the priod before the beginning of the program -4kg average.

## **6. Cost Benefit Analysis**

To develop the Program of guidance in food consumption and nutritional education (Attivita' di orientamento dei consumi e l'educazione alimentare) the Regional Council allocated annually a sum 260,000 Euros to each province. The funds allocated for the communication campaign "Eat well, live healthy" (IT) was approximately 15 million Euros. In none of the former cost/effectiveness was evaluated.

The intervention cost of Piemonte Obesity Project is about 90 Euros per patient for one year of therapy (paid by National Health Service, NHS). Such expenditure is lower than the estimated costs of treating health complications of obesity. Moreover its effectiveness was clear in terms of lasting weight reduction in a consistent number of participants<sup>82</sup>. In France the cost of FLVS study was 75 Euros per person/year. But cost benefit was not evaluated.

North Karelia's further evaluation emphasized that although changing the diet and other risk-related lifestyle factors among high-risk persons can bring great benefit to those individuals, population based prevention through influencing the population's diet and other lifestyle

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<sup>80</sup> <http://www.epode.fr>

<sup>81</sup> DATA: ad hoc consumer interview surveys (on food) and self-completed questionnaires (on health)

<sup>82</sup> [http://www.lagazzettaweb.it/Pages/rub\\_sal/2009/salute/r\\_nssal\\_09-06.html](http://www.lagazzettaweb.it/Pages/rub_sal/2009/salute/r_nssal_09-06.html)

factors is by far the most cost-effective and sustainable way for a reduction in CVD rates and promotion of heart health in the population<sup>83</sup>.

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<sup>83</sup> Puska P, 2009, FAt and Heart Disease: Yes We Can Make a Change - The Case of North Karelia (Finland), *Ann Nutr Metab* 2009;54(suppl 1):33–38 DOI: 10.1159/000220825

## 7. Discussion

This study revealed that the better evaluated categories were: a) Regulation of meals at school/canteens; b) Public information campaigns; and c) Nutrition Education Programmes. In general little or no evaluations have been carried out in terms of (or measured as) behavioural changes and cost/benefit.

Regarding *public information campaigns*, there is evidence from consumer interview surveys (on food) and self-completed questionnaires (on health) that more people now know and understand what is meant by a healthy diet, even if this does not always translate into consistent practice (Food and Well Being, Wales).

What is striking from the publicised “Five-a-day” campaign is that aggregated data suggest that changes in intake are not nutritionally relevant. Such results suggest that awareness and knowledge do not translate into behaviour.

Regarding interventions *regulating school meals*, contradictory findings were found in terms of consumption. For example, the evaluation of national Fruit Snack campaign (IT) showed that 54% of the students declared through questionnaires that they believed that their consumption of fruit and vegetables increased. Nevertheless the collection of monthly consumption data of fruits and vegetables made by the owners of the school vending machines, showed no substantial increase of the use of these products. From focus groups, a potential explanation emerged, that students included regularly fruit and vegetables at home during the consumption of the main meals, and hence it should account for their reported increase. This experience suggests that contradictions would be avoided if an agreed measurement unit/technique would have been applied for evaluation.

*Nutrition education in schools* can be successful in promoting awareness and generating healthy habits such as snacking with fruit as Italian Contract for snack reported. This program would not have been possible without parents’ involvement and their awareness of the importance of nutrition education. Furthermore, this exemplifies the need for strategic alliances between concerned actors in carrying out this task. Since the interventions consisted of providing snacks to children, their taste played also a not negligible role when parents did not renew their participation in the contract. This local initiative started as an action to prevent overweight and obesity in children. Adequate measurements were taken and anthropometric evaluation was possible before and after (1y interval). Nevertheless, no impact could be observed in BMI-for-age. This observation (supported by the experience of EPODE and FLVS) suggests that a sufficient duration and intensity of the intervention are needed to observe any significant changes.

The Portuguese Platform against obesity has several community-based components. Each component has reported specific behavioural changes such as reduced fat consumption or improved food habits. However, it exemplifies the lack of objectively verifiable evaluation indicators, and remains in the realm of “claims by the campaign itself”.

Although *cost-benefit analysis* was performed only in one of the interventions (Piemonte Obesity Project), it suggests that prevention is certainly cheaper than treatment of obesity. Therefore, actions aiming at the prevention of obesity, or its treatment with group sessions and involvement of a support network might be encouraged.

## 8. Conclusions and recommendations

The overall results of this exercise highlight a couple of subjects that have to be considered in future policy formulation and action's evaluation. First of all, *public information campaigns* are successful in increasing knowledge, create an intention to engage in desired behaviours, but somehow they fail to achieve actual behavioural change. This is worrisome since the large majority of funds were invested in such campaigns. In second place, there are few examples of potentially successful interventions classified as *nutrition education*, particularly when a multi-sector and bottom-up approach is applied, showing that the adoption of a multidisciplinary and comprehensive approach and the use of a range of actions can give better results. It seems general population is more likely to “appropriate” and engage in any intervention they feel part of. Viral growth is what FLVS exemplified, with cities joining year after year and spreading even outside Europe.

This study also emphasises the need for harmonized indicators and advocates for better informed (evidence based) policy choices. Proper evaluations should be included in any public funded action, particularly when health outcomes are expected. Reasonable health outcomes such as reduced overweight levels or increased physical activity do not appear from one day to the other; such changes need time and due process. It is clear that changes at population level require a reasonable time frame to be measurable e.g. weight loss, or changes in nutritional status at population levels. Planning strategically ahead of time and applying pertinent indicators will prevent from spoilage of EU resources in interventions that may not have any significant effect.

### 8.1 *Indicators for assessment*

This study highlighted the need of developing harmonised and verifiable indicators for measuring success and comparing between countries. Furthermore, EU policies should provide a set of indicators that may be regularly collected in all countries. Since impact on health is mostly measured using nutritional status based on BMI, such measures should be considered relevant in regular surveys, although performing those measurements is time consuming and requires expertise. BMI based nutritional status categories from measured heights and weights are however the most reliable epidemiological indicator for population studies.

Distinction should be made between intentions, attitudes, knowledge and behaviour. Measurement knowledge of specific messages does not imply adopting a desirable behaviour (healthy eating, increased physical activity, etc.), since other drivers of behaviour may play a role, particularly when e.g. individuals have to choose between different food items<sup>84</sup>.

Where there is a large scope for action is at the level of consumption. Food consumption (or availability) can be measured directly or indirectly. Indirect methods include secondary analysis of nationally representative surveys (such as Household Budget Surveys). An important recommendation is to harmonize data collection with the final aim of monitoring food availability in Europe and follow-up trends in consumption. At the same time, more specific nutrition surveys should not be neglected, since often they provide the evidence for

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<sup>84</sup> Nutr Hosp. 2010;25(1):123-126

the impact (or lack of it) of any given action. Most “healthy eating” actions suggest the consumption of specific food groups, such as fruits, vegetables, fibre, dairy. Specific indicators for key food products could be developed and applied.

In general, clear and verifiable indicators should be requested from any intervention aiming to change behaviour or nutritional status. In words of a stakeholder so far in most cases attempts to evaluate interventions or their implementation remains in the “intuitive”<sup>85</sup> domain. Consequently, it is necessary to bridge the gap between scientific community and policy makers. This project has shown that many interventions, where tax-payer money was invested, did not make statistically significant changes or even worsened the scenario. Europe should avoid repeating such experiences and provide this platform for exchanging purely scientific research with actual policy actions.

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<sup>85</sup> Interview to the President of the Belgian Nutrition Society

9. **Annex 1 List of Evaluation documents/actions and whether they assessed impact on awareness, consumption, health or if cost-benefit analysis was performed**

Country	Name	Impact on Awareness evaluated	Impact on consumption evaluated	Impact on Health evaluated	Cost-effectiveness evaluated
PT	Platform against obesity (Plataforma contra a obesidade)	No	No	No	No
PT	Projecto Obesidade Zero (Project Zero Obesity)- Platform against obesity	No	No	No	No
PT	Programa Educativo "apetece-me"- Platform against obesity	No	YES	No	No
PT	Projecto com Peso e Medida - Platform against obesity	No	No	No	No
PT	Progama Peso Comunitario - Platform against obesity	No	YES	YES	No
PT	Rituais de vida saudavel - Platform against obesity	No	No	No	No
PT	"Por Nós" - Obesity and Diabetes prevention in Salvaterra de Magos - Platform against obesity	No	No	YES	No
PT	Saúde Contra Obesidade - "PróSaúde" - Platform against obesity	No	No	YES	No
PT	Programa 5 ao dia (5 a day program) - Platform against obesity since Jan 2008)	No	No	No	No
PT	Programa 5 ao dia (5 a day program) - Platform against obesity since Jan 2008)	No	No	No	No
PT	Selfregulatory Code of Good Practice in Commercial Communication to Minors	No	No	No	No
ES	Spanish Self-Regulatory Code on Food Advertising to Children (Codigo PAOS)	No	No	No	No
ES	Strategy for Nutrition, Physical Activity and the Prevention of Obesity (NAOS)	No	No	No	No
ES	PERSEO program - NAOS strategy	No	No	YES	No
ES	Five a day (5 al dia)	No	No	No	No
ES	Thao Project	No	No	No	No
ES	EDAL	No	No	No	No
ES	Agreement between Spanish Ministry of Health and Spanish Bakers Confederation.	No	No	No	No
ES	Agreement between Spanish Ministry of Health and Spanish National Association of Vending Machines Providers	No	No	No	No
ES	Agreement between Ministry of Health and Spanish food and drinks Industries Federation.	No	No	No	No
ES	Agreement between Ministry of Health and Restaurants and Hotels Federation	No	No	No	No
PL	"Keep Fit !" (Trzymaj Formę)	No	No	No	No
PL	"5 servings of vegetables, fruit or juice" (5 porcji warzyw, owoców lub soku)	YES	YES	No	No
PL	"Fish affect all and everything" (Ryba wpływa na wszystko)	No	No	No	No
PL	"I know what I eat" (Wiem co jem)	No	No	No	No
PL	"Bet for milk and dairy products" Stawiam na mleko i produkty mleczne	YES	no	No	no

PL	"The school milk program" Mleko w szkołach	YES	YES	No	no
PL	Mlekosław	YES	YES	No	no
PL	"Get Know Good Food" Pozaj Dobrą Żywność	No	No	No	No
PL	"State aid for feeding program" (pomoc państwa w zakresie dożywiania)	No	No	No	No
PL	"The National Primary Prevention Programme of Neural Tube Defects in Poland" Program Pierwotnej Profilaktyki Wad Cewy Nerwowej	No	No	No	No
PL	"The National Programme for the Elimination of Iodine Deficiency" (Program eliminacji niedoboru jodu w Polsce)	No	No	No	No
PL	"National Cholesterol Prevention Programme" (Narodowy Program Profilaktyki Cholesterolowej)	No	No	No	No
PL	CINDI (Countrywide Integrated Noncommunicable Diseases Intervention) Poland	No	No	No	No
PL	"The POLKARD Programme" (POLKARD Narodowy Program Profilaktyki i Leczenia Chorób układu sercowo-naczyniowego)	No	No	No	No
PL	Euroaction Poland	No	No	No	No
PL	"Programme for the Prevention and Treatment of Diabetes in Poland for the years 2006-2008" (Program Prewencji i Leczenia Cukrzycy w Polsce)	No	No	No	No
PL	National Program for Prevention of overweight and obesity, and Chronic Noncommunicable Diseases Through Improved Nutrition and Physical Activity POL-HEALTH	No	No	No	No
UK	5 a day Programme (Department of Health)	YES	YES	No	No
UK	Junk Food Ban became compulsory for secondary schools this year (2009) (Department for children, schools and families)	No	No	No	No
UK	Ofcom Restrictions: The restrictions on advertising for foods high in fat, salt and sugar (HFSS)	No	No	No	No
UK	Healthy Start (Department of Health)	No	No	No	No
UK	Change4Life (Department of Health)	No	No	No	No
UK	Take life on, one step at a time (NHS Health Scotland- Scottish Government)	No	No	No	No
UK	FSA's salt campaign (Food Standards Agency)	No	No	No	No
UK	Value Added Tax Policy in the UK	No	No	No	No
UK	Fuel Zone	No	YES	No	No
UK	Traffic light labelling (Food Standards Agency)	No	No	No	No
UK	Food and Well Being: Reducing Inequalities through a Nutrition Strategy for Wales (FSA-Wales)	YES	YES	No	No
UK	Eat Well to keep well (Public Health Agency, June 1998, October 1999)	YES	YES	No	No
UK	Points4Life, by Manchester City Council and Manchester NHS. The scheme will be launched to the public in early spring 2010	No	No	No	No
UK	Scottish Grocer's Federation (SGF) Healthy Living Programme. (Scottish Government , 2004)	No	No	No	No
UK	Liverpool's Challenge (Liverpool NHS Primary Care Trust 2008-2009)	No	No	No	No
UK	Healthy Towns' programme (cross-government strategy for England between 2008/09 and 2010/11 )	No	No	No	No

IE & N.Ire	Little Steps Campaign (Health Service Executive, safefood (ROI), Health Promotion Agency (NI) 2008)	No	YES	No	No
IE	Every Step Counts - Small Changes Make The Difference	No	No	No	No
IE	Ban on television advertisements for sweets and fast food	No	No	No	No
BE	BE Tutti Frutti - Fruit at School	YES	YES	YES	No
BE	BE Thursday Veggie Day	No	No	No	No
BE	BE VIASANO	YES	No	YES	No
BE	BE Happy Body Project	No	No	No	No
DE	DE KiGGS	No	YES	YES	No
DE	DE The German Platform Diet and Physical Activity	No	No	No	No
FR	EPODE (Ensemble, Prevenons l'Obésité Des Enfants / Together, let's prevent obesity in children)	YES	No	YES	No
FR	Campagne média du PNNS (PNNS media campaign)	YES	No	No	No
FR	Un fruit pour la récré (a fruit for recreation time)	No	No	No	No
FR	Suppression des distributeurs automatiques dans les écoles (removal of vending machines from schools)	No	No	No	No
FR	Publicité alimentaire: messages sanitaires obligatoires (Food advertising: mandatory health messages)	YES	YES	No	No
FR	“ Lait scolaire” (School Milk)	No	YES	No	No
FR	FLVS - Fleurbaix Laventie Ville Santé Study	YES	No	YES	No
FR	Programme national de réduction des risques cardiovasculaires (National program to reduce cardiovascular risk)	No	No	No	No
FR	Diabète, halte aux complications (Diabetes, stop the complications)	No	No	No	No
IT	GUADAGNARE SALUTE (Gaining Health- To make healthy choices easier)	No	No	No	No
IT	CULTURA CHE NUTRE (Feeding culture)	No	No	YES	No
IT	IL SALE NELL'ALIMENTAZIONE PER LA PROFILASSI DELLA CARENZA IODICA E LA CURA DELL'IPERTENSIONE”	YES	YES	YES	No
IT	DIABETE (Diabetes)	No	No	No	No
IT	MANGIA BENE CRESCI MEGLIO (Eat well grow better)	No	No	No	No
IT	VIVI SANO, MANGIA BENE (Eat well, live healthy)	YES	YES	No	No
IT	CORRETTA ALIMENTAZIONE E PROMOZIONE DELL'ATTIVITA' FISICA (Correct nutrition and promotion of physical activity)	No	No	No	No
IT	SAPERMANGIARE.MOBI (To know how to eat. mobi)	No	No	No	No
IT	NUTRITEVI DEI 5 COLORI DELLA VITA (I 5 COLORI DEL BENESSERE) (Feast of the colours of life, the 5 colours of wellness)	YES	No	No	No
IT	LA PAUSA CONSAPEVOLE: NUTRIVENDING (Aware break: Nutrivending)	No	YES	No	No
IT	ATTIVITA' DI ORIENTAMENTO DEI CONSUMI E L'EDUCAZIONE ALIMENTARE (Guidance activities in foods consumption and nutrition education)	YES	YES	YES	No

IT	SAPERE I SAPORI (Know the flavours)	No	No	YES	No
IT	UNA SANA ALIMENTAZIONE PER TUO FIGLIO (Healthy eating for your child )	YES	No	No	No
IT	PROGETTO OBESITA' PIEMONTE (POP) (Piemonte Obesity Project)	No	No	YES	YES
IT	I COLORI DEL CIBO (The colours of food)	No	No	No	No
IT	LINEE GUIDA PER LA RISTORAZIONE SCOLASTICA (School catering guidelines)	No	No	No	No
IT	L'ORTO A SCUOLA (The school vegetable garden yard)	No	No	No	No
IT	ALIMENTAZIONE, MOVIMENTO, STILI DI VITA: ISTRUZIONI PER L'USO (Diet, physical activity, lifestyles: instruction for use) (1)	No	No	No	No
IT	PROGETTO REGIONALE DI SORVEGLIANZA ED EDUCAZIONE ALIMENTARE NELLA POPOLAZIONE SCOLASTICA	YES	YES	No	No
IT	MANGIARE INSIEME (Eating together)	No	YES	No	No
IT	FRESH BREAK - FRUTTA SNACK. PIU' GUSTO E PIU' SALUTE NELLE SCUOLE E NEI POSTI DI LAVORO	YES	YES	No	No
IT	FRUTTA SNACK (Fruit snack)	YES	YES	No	No
IT	CONTRATTO DELLA MERENDA(Snack agreement)	YES	YES	YES	No
IT	EDUCAZIONE ALIMENTARE: UN INTERVENTO INTEGRATO (Nutritional education: an integrated intervention)	No	YES	No	No
IT	LO SPAVENTAPASSERI (The scarecrow)	No	No	No	No
DK	Everything about nutrition - taste for life	YES	No	No	No
DK	Get healthy having fun (part of Everything about nutrition.	No	No	No	No
DK	The 8 nutrition recommendations (part of Everything about nutrition)	No	No	No	No
DK	Food in motion	No	YES	No	No
DK	An easier childhood	No	No	No	No
DK	Danish Whole Grain campaign	No	No	No	No
DK	6 a day, developed and implemented	No	No	No	No
N	Physical activity and meals in schools,	No	YES	No	No
N	More fruit campaign	No	No	No	No
N	The Norwegian School fruit programme	No	No	No	No
N	Enjoy eating	No	No	No	No
S	Stopp, Stockholm obesity prevention project	No	No	YES	No
S	Keyhole	No	No	No	No
S	Half a kilo a day	No	No	No	No
S	How do you eat SMART?	No	No	No	No
FI	North Karelia Project	No	No	No	No
FI	The East Finland Berry and vegetable project (part of North Karelia Project)	No	No	No	No

FI	Half a kilo a day	No	No	No	No
FI	Heart symbol	No	No	No	No

**10. Annex 2: Previous EU Funded projects relevant for EATWELL but not directly involved with healthy eating and policy making**

**AVENA Study<sup>86</sup>**

Nationally funded<sup>87</sup> AVENA study was a multicenter study was performed involving a representative sample of urban Spanish adolescents aged 13 to 18.5 years. The population was selected by multiple-step, simple random sampling —first taking into account location (Madrid, Murcia, Granada, Santander and Zaragoza) and then by random assignment of the school within each city. The cities were chosen according to the population rate (> 100,000 inhabitants), geographical location in the country (north-south gradient, in order to be representative) and taking into account the main technical question, that is, the necessity of having a research group in the city. Sample size was stratified by age and gender.

Overweight + obesity prevalences were 25.69 and 19.13% in boys and girls, respectively. Overweight + obesity prevalence increased in boys from high to medium-low socioeconomic status categories ( $p = 0.015$ ); meanwhile, there was not a significant effect of socioeconomic status in girls. In males, overweight + obesity prevalence changed from 1985 to 2000–2002 from 13 to 35% and in females from 16 to 32%. The rate of change in overweight + obesity prevalences seems to increase in the last years; from 0.88 (1985 to 1995) to 2.33%/year (1995 to 2000–2002) in males and from 0.5 (1985 to 1995) to 1.83%/year (1995 to 2000–2002) in females<sup>88</sup>.

**HELENA Study:**

Inspired by AVENA, EU funded project<sup>89</sup> Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) was a randomized multi-centre investigation of the nutritional and lifestyle status of adolescents in 10 European cities. The study also measured variation in lifestyle habits and nutritional status by region, cultural background, socioeconomic status, gender and age.

Dietary patterns in childhood and adolescence have been associated with obesity development. Among those factors one can mention low meal frequency, skipping breakfast, and a high consumption of sugar sweetened beverages. Potential exists that some dietary factors may cluster in the same adolescents which could increase their individual risk related with each of the factors. For time trends, there is little information, mostly coming from the USA; however, available direct or indirect data suggest that the worldwide trend in adolescents is to increase in factors related to obesity development<sup>90</sup>.

HELENA reported that Overweight prevalence was 19.5% in boys and 16.3 in girls. Obesity prevalence was 7.6% in boys and 4.4% in girls. As overweight and obesity are frequent

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<sup>86</sup> *Nutricion Hospitalaria* 2003;18(1):15-28

<sup>87</sup> The AVENA study was supported by Spanish Ministry of Health (00/0015) and by grants from the Spanish Higher Sports Council (05/UPB32/01, 09/UPB31/03 and 13/UPB20/04), the Spanish Ministry of Education (AP2003-2128 and AP2004-2745), Coca-Cola, Panrico SA, Madaus SA and Procter & Gamble SA.

<sup>88</sup> *Ann Nutr Metab* 2005;49:71–76 DOI: 10.1159/000084738

<sup>89</sup> FP6-2003-Food-2-A, FOOD-CT-2005-007034

<sup>90</sup> Moreno, Luis A., Rodríguez, Gerardo, Fleta, Jesús, Bueno-Lozano, Manuel, Lázaro, Aurora and Bueno, Gloria (2010) 'Trends of Dietary Habits in Adolescents', *Critical Reviews in Food Science and Nutrition*, 50: 2, 106 — 112

conditions in adolescents, having relevant health consequences in the future, public health measures need to be implemented<sup>91</sup>.

## **DIOGENES**

Diogenes is a Pan-European, randomized, controlled dietary intervention study investigating the effects of dietary protein and glycaemic index on weight (re)gain, metabolic and cardiovascular risk factors in obese and overweight families in eight European centres. The Diogenes dietary intervention study is the largest dietary intervention study, specifically focusing on longterm weight loss (children) and weight-loss maintenance (adults) in obese families, conducted to date. The study design is unique in that it integrates a number of scientific disciplines, including a classical prospective long-term, randomized, controlled study design, rigorously examining issues influencing energy balance via energy intake (food diaries, compliance questionnaires and the supermarket system), physical activity (questionnaires and pedometers), physical activity patterns (IDEEA), energy expenditure measurements (BMR and DLW) and various sociopsychological factors (questionnaires).

Furthermore, a large number of blood, urine and fat biopsy samples were collected for a detailed analysis of risk factors related to type 2 diabetes and cardiovascular diseases and for biomarker analysis. The diets were controlled through two different approaches: the shop model, providing the highest possible control of food intake among free-living subjects and intended to test the *efficacy* of the study regimes (the ability of a treatment to produce benefit if applied ideally); and the instruction only model, intended to show the *effectiveness* of the study regimes (the benefit that actually occurs when a treatment is used in practice).

The use of these two different study designs may mean that not all results from all the centers are universally comparable. The study design includes an initial weight-loss phase for the adults only. This design was chosen as it will take years in a large population to study the effects of a certain diet on weight gain. In such situation the compliance becomes a real problem. Therefore a design was chosen that focused on weight regain after a period of weight loss. From previous studies we know that in the first 6 months subjects are quite vulnerable to regain weight. This design makes it possible to undertake such a large scale dietary intervention within a reasonable time period without running into compliance and financial problems.

## **EARNEST** European Early Nutrition Programming Project (EARNEST FOOD-CT-2005-007036)

This project is a large collaborative investigation into the long-term consequences of early nutrition by metabolic programming. It brings together a multi-disciplinary team of scientists from 38 institutions in 16 European countries. It is funded under the Food Quality and Safety Priority of the Sixth Framework Programme for Research and Technical Development of the European Community. The project will run from 2005 to 2010 and is being coordinated by Professor Koletzko of the Children's Hospital, University of Munich, Germany.

It will investigate early nutrition programming using an approach which integrates knowledge from randomized controlled trials, prospective observational studies and animal, cellular and molecular techniques. This will enable a better understanding of the extent to which nutritional influences in early life can program a person's development and metabolism in

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<sup>91</sup> Moreno L on behalf of the HELENA Consortium, HELENA– HEALTHY LIFESTYLE IN EUROPE BY NUTRITION IN ADOLESCENCE *Annals of Nutrition and Metabolism* 2009;55(Supl 1):65-65

adulthood. Other aspects of the project include studies to investigate consumer attitudes to early nutrition programming and the economic importance of early nutrition programming.

The EU Childhood Obesity Programme (CHOP) investigates whether the protein/fat ratio in infant formula and complementary feeds has lasting effects on obesity risks. The program will allow, for the first time, a one year multicentre intervention trial on new-born infants, to see whether feeding infant formulae, which differ in their level of milk proteins, can influence the risk of later childhood obesity. The trial will take place in five countries (Belgium, Germany, Italy, Poland and Spain) with different habitual total protein intakes to increase the range of protein intakes and improving the statistical power to test the 'early protein hypothesis' (i.e. Early protein intake predicts infant growth and later risk of childhood obesity).

The first results of the EU Childhood Obesity programme indicate that low protein content infant formulae bring metabolic and endocrine benefits, as well as body growth rates close to that of breastfed babies. The further follow-up of the children as part of the EU project EARNEST will indicate whether these changes are associated with lower risk indicators of childhood obesity at a later age. Low protein content in infant formulae did not show any untoward effects and is considered safe.

## **HECTOR**

Out-of-home eating has been further studied by the HECTOR initiative. The HECTOR project established a platform for collaboration between the scientific community, consumer associations, and 12 small and medium sized enterprises (SME) so as to assess the supply and to understand the demand when eating out<sup>92</sup>. The project aims to further exploit the use of data on out-of-home food expenses that are regularly collected through the national household budget surveys, so as to develop a methodological framework to monitor out-of-home food choices in Europe.

### *Cross-sectional pan-European Consumer surveys*

#### *Obesity and Food-Related Lifestyle in Europe*<sup>93</sup>

Cross-sectional consumer survey carried out in Belgium, Denmark, Germany, Greece and Poland in January 2008<sup>94</sup>. The study found that Europeans giving more importance to 'self-fulfilment' (odds = 1.18), 'planning of meals' (odds = 1.15), and preferring 'snacks vs. meals' (odds = 1.24) are more likely to be obese. Respondents were less likely to be obese if they attached lower levels of importance to the use of 'shopping lists' (odds = 0.87). The overall picture is that a stronger interest in health, organic products and freshness, within the FLR domain of quality aspects, is associated with 'not being obese'<sup>95</sup>.

From a public health and economics perspective, the fact that attitudes towards advertising and product information differ between obese and non-obese consumers raises concern about

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<sup>92</sup> Trichopoulou, Naska, Orphanos on behalf of the HECTOR Consortium. EATING OUT: HABITS, DETERMINANTS, AND RECOMMENDATIONS FOR CONSUMERS AND THE EUROPEAN CATERING SECTOR - THE HECTOR PROJECT. *Annals of Nutrition and Metabolism* 2009;55(Supl 1):66-66

<sup>93</sup> EU funded consumer survey within **Q-PorkChains Project** FOOD-CT-2007-036245

<sup>94</sup> Detailed methodology has been published elsewhere: *Meat Science* 2010;84:284-292

<sup>95</sup> *Appetite* 2010;54:156-162

its choice and possible effectiveness as a strategy from the public sector to shift consumption patterns. Any intervention aimed at addressing obese consumers should keep in mind that new or innovative products might not be easily accepted given their lower interest in novelty. Furthermore, preference of convenient snacks over meals among obese consumers could be the rationale for the provision of more healthy and yet fast choices by the food retailers, for public promotion of meals, while at more personal level, it might be pertinent to take these characteristics into account by dieticians and family doctors.

### *Subjective health and obesity in European countries*<sup>96</sup>

Cross-sectional consumer survey in three EU countries<sup>97</sup>. The study found that subjective health was negatively associated with the likelihood of being obese. The likelihood of being obese decreased with higher perceived risk of suffering from stress and from cancer, whilst the likelihood of being overweight decreased with higher perceived risk of suffering from stress. Despite a tendency of lower interest in healthy eating among obese consumers, interest in healthy eating was not significantly associated with the likelihood of being obese or overweight<sup>98</sup>.

Potential health risks associated with overweight and obesity, such as heart disease, hypertension, or arthritis should be better communicated to different European population segments, particularly when almost 50% of Europeans are overweight. Communicating effectively requires identification of target population and that and their specificities are well understood and taken into account so as to make information meaningful, useful, and efficient. The study highlights the need that other underlying factors associated with obesity, such as subjective health and perceived risk of chronic diseases should be considered both at individual counselling and at public health policy levels.

In a similar study carried out from October 25<sup>th</sup> to November 9<sup>th</sup>, 2007 (unpublished data) inverse association between subjective health construct and obesity has been found in six EU countries (Belgium, France, Italy, Norway, Poland and Spain)<sup>99</sup>. Study findings suggest that the more health conscious are less likely to be obese, and contrary to what one could expect, that convenience eaters are also less likely to be obese. Together with weight control, it looks like the attempts to lose weight do not necessarily translate into a more health conscious lifestyle or attitude<sup>100</sup>.

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<sup>96</sup> EU funded consumer survey within **SEAFOODplus Project**, FOOD-CT-2004-506359

<sup>97</sup> Detailed survey methodology has been reported at BMC Public Health. 2008 Sep 10;8:306 and Appetite 2009;53:399–406

<sup>98</sup> Appetite 2009;53:399–406

<sup>99</sup> The research methodology has been described elsewhere: Pieniak Z, Verbeke W, Vanhonacker F, Guerrero L, Hersleth M. Association between traditional food consumption and motives for food choice in six European countries. Appetite. 2009;53(1):101-8.

<sup>100</sup> Unpublished data analysis made by UGENT team.

## Appendix 3

**Interventions to promote healthy eating. What works, what doesn't and what's promising : A Literature Review**



Grant agreement no.: 226713

## **Work Package 1**

Benchmarking nutrition policies in Europe, their evaluation and identification of successes and failures

# **Interventions to promote healthy eating What works, what doesn't and what's promising : A Literature Review**

Main responsibility for this document: UREAD

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## Executive Summary

Obesity has been estimated to cost the European Union (EU) approximately €70 billion annually through health care costs and lost productivity, with poor diet quality costing 70,000 lives per year in the UK alone. Although in several EU Member States there have been many public interventions to promote healthier eating, few have been formally evaluated.

This report summarizes a number of previous systematic reviews, academic papers and institutional reports addressing nutrition, obesity and related policy interventions. The starting point is the recent reviews carried out by the Health promotion through Obesity Prevention across Europe (HOPE) project and the OECD, the evidence compiled in Mazzocchi, Traill and Shogren (2009) and any other relevant recent systematic reviews.

We report their findings and supplement them with more recent literature and, as appropriate, our own interpretation of the findings (largely from the perspective of an economist's model of food consumer choice, the operation of markets and the concepts of private and social costs.)

The review is divided mainly in two sections, one covering interventions that encourage informed choice and the other with interventions aimed at changing the market environment.

### **Supporting more informed choice**

#### **Advertisement controls**

Advertisement controls actually implemented by governments seem to suggest that reducing or banning completely unhealthy food advertisements (in particular those aimed at children) have a positive effect in reducing overweight prevalence in children. However, this effect could be diluted if the food industry substitutes television advertising with other forms of marketing.

#### **Public information Campaigns**

Public information campaigns have been successful in raising awareness related to healthy eating and its problems. However, there is less evidence that this has translated into a change in nutritional behaviour. This might be explained in part by the long periods of time needed to really achieve changes in attitudes among people and through society. Social marketing campaigns alone could take decades to have a real impact on diet and weight, plus this implies constant adequate funding from governments for a long period of time. This is corroborated by specific evaluations that find relatively modest effects of social marketing campaigns for periods immediately following policy introduction.

#### **Nutrition Education**

Overall, the literature suggests that nutritional education can have an impact on healthy eating and overweight, however the impact is not homogeneous throughout the population since certain groups are more receptive than others, notably the obese are more receptive. Furthermore, adequate nutritional education requires a significant increase in funding from governments and ensures that the target population is exposed as long as possible if these types of interventions are expected to have a satisfactory effect on healthy eating.

### **Nutrition Labelling**

From an economic perspective, nutrition information is vital to informed choice which is the basis of economic decision making. However, informed choice is not necessarily healthier, labelling may improve consumers' economic welfare by enabling them to make informed choice while yielding no improvements in diet and health.

### **Nutrition Information on Menus**

The literature reviewing nutritional information on menus, so far has no conclusive evidence in favor or against the introduction of such policy. This is due mainly to the fact that the introduction of nutritional information on menus is relatively recent and partial, with only a number of restaurant chains including the information on their menus.

## **Policies aimed at changing the market environment**

### **Fiscal Measures**

Fiscal interventions reviewed are a direct way to make individuals pay the social costs of their food. However, actual *fat taxes* and *thin subsidies* have not been implemented anywhere in the EU so there is no actual evidence of their effectiveness and applicability. In general, the review suggests that a small tax on certain foods, even if not inducing behaviour change, could raise valuable funds for health promoting interventions. Finally, *fat taxes* distributional effects might be regressive, although the health effects are progressive.

### **Subsidies (e.g. vouchers) to disadvantaged consumers**

Overall, the literature suggests that in order for food subsidies or vouchers to be effective and to promote healthy eating, the types of food included in the scheme should exclude unhealthy options. The schemes are relatively new, applied only in the US and UK, and have not been formally evaluated as yet.

### **School or workplace food availability**

Dealing with children's school canteens it is always difficult to isolate the influences of parents, the environment outside schools and the environment inside schools. Therefore, evaluating the impact of a particular intervention is complicated. Nevertheless, in general the previous literature coincides in pointing out that the school environment matters and that efforts should be made to encourage pupils to undertake a healthy lifestyle which includes healthy eating. From an adults perspective, although some country specific examples are encouraging it is clear there is no "*one size fits all*" intervention at the workplace, however what emerges from some of the articles reviewed is that adequate policies that encourage healthy eating inside and outside the work environment consistently for long periods of time can have the desired outcome of improving diets and reducing obesity.

### **Nutrition-related standards**

The literature identifies several factors behind the success of nutrition-related standards and government-industry collaboration for reformulation. To start they identify the need of national experts that study the problem and provide concrete recommendation. Second, the role of the media in raising awareness and facilitating or encouraging the industry to change is not to be underestimated. Third, consumer awareness and sustained demand for industry change, complemented in some cases by government involvement to ensure product reformulation by the industry.

**Policy interventions not explicitly targeted at healthy eating but relevant.**

Arguments linking obesity and agricultural subsidies present mixed evidence, although in general economists tend to be sceptical that agricultural subsidies or policies are to blame for unhealthy habits. Rather, researchers tend to favour the thesis that increases in production efficiency and continuing research and development in the agricultural sector are responsible for a long-term decline in agricultural and food prices and consequent increase in consumption<sup>101</sup>. If we focus on other interventions such as VAT, we can see that they can be used to reduce the price of healthier options relative to unhealthy foods, though to date they have not been used in that way, nor is it likely that differential VAT rates would be significant enough to induce major consumption change.

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<sup>101</sup> We refer interested readers that want to get more information regarding research and development in the agricultural sector and its effects on food ingredients to several studies by Alston et al. (2009)

## **Interventions to promote healthy eating: What works, what doesn't and what's promising : A Literature Review**

### **1. Introduction**

This report summarizes a number of previous systematic reviews, academic papers and institutional reports addressing nutrition, obesity and related policy interventions. Our starting point is the recent reviews carried out by the HOPE project and the OECD, the evidence compiled in Mazzocchi, Traill and Shogren (2009) and any other relevant recent systematic reviews. We report their findings and supplement them with more recent literature and, as appropriate, our own interpretation of the findings (largely from the perspective of an economist's model of food consumer choice, the operation of markets and the concepts of private and social costs.) Our approach therefore involves updating, whenever possible, the latest literature available following a similar, but not fully, systematic methodology.

The set of policy interventions revised were divided into two big groups, one dealing with market environment interventions and the other with information interventions as follows:

Supporting more informed choice
Advertising controls - On advertising to children - On general advertising Public information campaign (e.g. to promote fruit and veg consumption, reduce salt intake) Nutrition education - For children (e.g. at school) - For adults (e.g. at workplace) Nutritional labelling Nutritional information on menus
Policies aimed at changing the market environment
Fiscal measures - Tax/subsidies on foods to the population at large - Subsidies (e.g. vouchers) to disadvantaged consumers Regulate meals - School meals (including vending machine bans and provision of free fruit and vegetables) - Workplace canteen meals Nutrition-related standards (e.g. limits on unhealthy nutrient content for certain foods, portion sizes, etc.) Policy interventions not explicitly targeted at healthy eating but relevant (e.g. VAT rates, agricultural policy, etc.)

Source: adapted from Mazzocchi, Traill and Shogren (2009)

In addition to reports and systematic reviews, we have searched for more recent relevant articles to ensure the review is up to date. To do so, we used a series of secondary data sources; PubMed, Google Scholar, and ECONLIT databases and used a combination of the following terms: Nutrition, Obesity, Education, Social Marketing, away-from-home, food stamps, vouchers, fat taxes, thin subsidies, menus, nutritional information, food labelling, fiscal, nutrition, agricultural policy, and agricultural subsidies.

It is worth noting that the studies and literature that we used do not necessarily follow the policy classification given above, however they cover more or less the same topics, albeit in a

broader way. So, one of the added values of this report, besides updating previous literature reviews is to be more specific in the number of policies being reviewed and to cover them all under one single document.

## 2. Supporting more informed choice

### 2.1 Advertising controls

Marketing of unhealthy food has been blamed as a potential causal factor for weight gain and obesity, drawing especial concern about the way food is marketed to children.<sup>102</sup> To address this issue, researchers and public health officials have studied or applied regulations/bans on the way companies advertise unhealthy food products. However, the economic impact of such bans is not yet fully understood. While on one hand there is consensus acknowledging the impact of advertising on awareness, studies linking this to eating behaviour is far from conclusive<sup>103</sup>, so a proper cost-benefit evaluation is needed to also consider the effects that bans could have on consumers and to what extent the prevention of information through an advertisement ban could affect their choices and the market<sup>104</sup>.

Advertising can play a role in influencing nutritional behaviour, especially since it focuses not only on individuals but also on their environment (social needs) and desires. Therefore, researchers studying weight outcomes have focused on the possible links between the growing trend in obesity and the advertisement of foods high in fat, sugar and salt<sup>105</sup>.

Yet, there is not conclusive evidence linking food advertisement to poor diets, so there is an ongoing debate<sup>106</sup> in the literature on the applicability and usefulness of the implementation of advertisement bans and/or stricter regulation.

Nevertheless, an increasing number of reviews and empirical tests tend to provide evidence, albeit weak<sup>107</sup> in some cases, that food advertising can influence the amount of unhealthy food being consumed by children. In Canada for example, **Baylis and Dhar (2007)** found that the ban on advertising to children imposed by the province of Quebec in 1980 had an effect on the number of fast food meals purchased leading to a decrease of 11 to 22 million fast food meals per year due to the ban or 8.9 to 23 billion calories.

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<sup>102</sup> See HOPE (2009) and Sassi et al. (2009).

<sup>103</sup> Zywicki et al. (2004) suggest that food marketing to children has not grown markedly during the years that children's obesity has increased, giving evidence against food advertisement as a causal factor in children's obesity trends.

<sup>104</sup> See Mazzocchi et al. (2009)

<sup>105</sup> Most television adverts concentrate on: pre-sugared breakfast cereals, soft drinks, confectionery, savoury snacks and fast food outlets — see Skinner et al. (2005), while the main advertisement techniques used by food companies to allure children include: TV advertisement, in-school marketing, sponsorship, product placement, sales promotions and internet marketing — see Hawkes (2004).

<sup>106</sup> The food industry might claim that advertisement does not necessarily increase consumption of unhealthy food, but rather encourage brand shifting. See HOPE (2009) narrative report.

<sup>107</sup> Ashton (2004) has reviewed some of the evidence and concludes that current claims that food advertising is a major contributor to rising obesity among children is appealing, thus explaining why so many have embraced this idea. However, in his opinion there is still not enough evidence to support this assertion.

In Europe<sup>108</sup>, Sweden has in place a full ban on all advertisement aimed at children under 12, as well as advertisements before and after children's programmes. Ireland introduced a new statutory code which bans the use of celebrities, sports or cartoon characters to promote food or drink, and the UK moved from a voluntary agreement to the introduction of new rules restricting TV advertisement of products high in fat, salt or sugar around children's programmes<sup>109</sup>. Unfortunately, the potential beneficial effects that these bans could have on their target is likely to be undermined by the lack of coordination among European countries. Indeed, the European Union's *Television Without Frontiers Directive* prevents countries like Sweden from blocking UK's or other member countries' TV signals that can reach the country, thus diluting partially the effects of the national total ban on children's advertisement. That is why many authors (e.g. **Matthews 2008**, **Hawkes 2004** and **Caraher et al. 2006** among others) have called for global regulation, given that advertisement occurs globally and easily crosses national borders.

From an economic perspective, one of the main issues that arises from advertising regulation is who would bear the costs of advertising controls or bans (e.g. in the case of less revenue to the advertising companies, what would be the costs for consumers? What advertisements would replace food and what would be their impact on health?). In the UK, its regulatory agency, OFCOM carried out a recent evaluation of its ban on advertisement to children and concluded that children aged 4-9 saw 39 percent less advertisement of unhealthy food, while children aged 10-15 saw 28 per cent less advertisement compared to the same period before the ban was implemented<sup>110</sup>.

To conclude, the interventions actually implemented by governments seem to suggest that reducing or banning completely unhealthy food advertisements (in particular those aimed to children) have a positive effect reducing overweight. However, this effect could be diluted if the food industry substitutes television advertising with other forms of marketing.

## 2.2 Public Information Campaigns (Social Marketing)

**Halpern et al. (2004)** define Social marketing<sup>111</sup> as the process through which governments try to induce *voluntary* positive changes in the behaviour of individuals, and to do so, use a wide range of commercial marketing techniques<sup>112</sup>. However, instead of focusing on profits as in the private sector, social marketing focuses on the welfare of the individual and the society. Advertising has been used successfully in the private sector, influencing behaviour, changing environments and generating new trends. Therefore, public information campaigns if implemented correctly have a lot of potential as tools to improve healthy eating through the inducement of changes in dietary and social behaviour.

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<sup>108</sup> See Caraher et al. (2006).

<sup>109</sup> See Ofcom Restrictions: the restrictions on advertising for foods high in fat, salt and sugar (HFSS) <http://www.ofcom.org.uk/>

<sup>110</sup> See <http://www.ofcom.org.uk/media/speeches/2008/12/hfssslides.pdf>

<sup>111</sup> A formal definition is provided by Andreasen A. (1995): *Social Marketing is the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence the voluntary behaviour of target audiences in order to improve their personal welfare and that of society.*

<sup>112</sup> Some examples include: consumer oriented market research, segmentation and targeting, and the marketing mix (see Gordon et al. 2006).

Mass media campaigns can reach big audiences in a fast and direct way. Public information campaigns aim to use the same marketing tools as used by the private sector to try to influence individuals towards healthier habits. **Sassi et al. (2009)** review previous studies and find evidence suggesting these types of interventions could increase consumption of fruit and vegetables. They indicate that estimated costs of this type of intervention could be around \$2.27 USD per target individual, with 2/3 of that amount being spend in broadcasting advertisement at a national level, while the remaining amount being used to hire personnel to design and supervise the intervention. On the other hand, **Mazzocchi et al. (2009)** based on their own review of the literature find evidence suggesting that information campaigns are often effective in increasing awareness, but less so in influencing behaviour.

**Stead et al. (2007)** point out that commercial marketing has a clear impact on individuals' behaviour, though there remains uncertainty whether it induces brand switching, category growth or both. Reviewing the related literature they find evidence that tobacco marketing actually encourages young people to start smoking and plays a key role in sustaining adult smoking. The same, they argue, applies to the alcohol and food industries. The food industry has specifically targeted children, with apparent impacts on their preferences and also their consumption behaviour<sup>113</sup>.

Several EU governments have already embarked in social marketing campaigns<sup>114</sup> to improve diets. In the UK for example, the *5 a day* campaign<sup>115,116</sup> (*designed to increase awareness of the health benefits of fruit and vegetables consumption by providing clear and consistent messages*) was launched at national level in 2003 following a 12 month pilot trial<sup>117</sup>. The process towards behavioural change is long and requires constant reminders to actually achieve permanent individual and environmental change. Environment and perceptions play a

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<sup>113</sup> From all advertisement directed to children in the UK, food products are dominant. See Hastings et al. (2003), Review of Research on the Effects of Food Promotion to Children, final report prepared for the Food Standards Agency, UK. <http://www.food.gov.uk/multimedia/pdfs/foodpromotiontochildren1.pdf>

<sup>114</sup> Some examples: the Republic of Ireland launched in 2004 its "Every Step Counts - Small Changes Make the Difference" national public awareness campaign to help tackle the issues of overweight and obesity. England has a social marketing campaign (TV, web, labels) to reduce salt consumption, while Poland has a public information campaign, "Fish affect all and everything" (Ryba wpływa na wszystko), that aims to increase consumption of fish and fish products by informing the public about the beneficial effects of a fish diet on the functioning of the body.

<sup>115</sup> Similar campaigns have or are taking place in other countries (US, Australia, France, Spain, Poland and Canada among others).

<sup>116</sup> For more information about the 5 a day programme please refer to the following websites: <http://www.5aday.nhs.uk/topTips/default.html>; [http://www.dh.gov.uk/en/PublicHealth/HealthImprovement/FiveADay/DH\\_134](http://www.dh.gov.uk/en/PublicHealth/HealthImprovement/FiveADay/DH_134); [http://www.5aday.nhs.uk/original/locally/documents/Pilot\\_executive\\_summary.pdf](http://www.5aday.nhs.uk/original/locally/documents/Pilot_executive_summary.pdf)

<sup>117</sup> See Ashfield-Watt, P., Welch, AA., Godward S. and SA Bingham (2007), Effect of a pilot community intervention on fruit and vegetable intakes: use of FACET (Five-a-day Community Evaluation Tool), Public Health Nutrition, 10(7): 671-680.

crucial role. Just as smokers tend to see the consequences of their acts as worth the risk<sup>118</sup>, so might unhealthy eaters.

To conclude, so far public information campaigns have been successful in raising awareness related to healthy eating and its problems. However, there is less evidence that this has really translated into a change in nutritional behaviour. This might be explained in part by the long periods of time needed to really achieve changes in attitudes among people and through society. Social marketing campaigns alone could take as long as decades to have a real impact on weight outcomes, plus this implies constant adequate funding from governments for a long period of time. **Wymer (2007, 2009)** argues that short-lived social marketing campaigns are doomed to fail due to the nature of the environment in which nowadays individuals live, where a series of factors encourage constantly unhealthy behaviours. This is corroborated by specific evaluation of the 5 a day campaign in the UK by **Douarin and Di Falco (2009)** as well as **Capacci and Mazzocchi(2009)** who find relatively modest effects of this social marketing campaign, however their evaluations are for periods immediately following policy introduction, therefore it might take longer to find evidence of actual changes or impacts of this particular campaign.

### 2.3 Nutritional Education

The **HOPE** review doesn't specifically examine this issue, since they focus more on catering in schools or alternative interventions within the school environment, which we will cover in the next sections. Therefore, in this section we will refer mainly to **Mazzocchi, Traill and Shogren (2009)** and **Sassi et al. (2009)**.

Nutrition education's main goal is to make people aware of what constitutes a healthy diet and ways to improve their diets and their lifestyles. This can be done through different channels, although in general this occurs within schools<sup>119</sup> targeting young children, since food habits in early stages of life are said to determine practices and preferences in adulthood<sup>120</sup>. Some have questioned whether, given the huge exposure people have received to healthy eating promotion, people still don't know the basics of what constitutes a healthy diet and lifestyle (don't eat too much, exercise more, eat more fruit and vegetables and less junk food). If this is correct, further investment in nutrition education would be ineffective.

The effects, if any, that nutritional education may have on eating habits or over obesity is still open to debate<sup>121</sup>. **Kan and Tsai (2004)** incorporate health risk knowledge as an additional

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<sup>118</sup> For example, Rindfleisch and Crockett (1999) show that perceived risks related to smoking are not enough a deterrent to swift individuals attitudes and suggest that antismoking campaigns should stress more financial implications of cigarette smoking as a more effective way to prevent smoking.

<sup>119</sup> In Finland, for example, nutrition is taught in schools as part of several courses (home economics, biology, environmental and health education). The courses aim to teach students how to choose and prepare healthy foods. See Roos et al. (2002).

<sup>120</sup> We refer interested readers to Oude Luttikhuis et al. (2009) for a thorough review of interventions for treating obesity in children.

<sup>121</sup> Previous literature, i.e., Dallongeville et al. (2000) study the effects that nutrition knowledge has on middle-age men in Northern France and find evidence suggesting that nutrition knowledge indeed influences consumption (nutrient intake). Nevertheless, even if those with a better nutrition knowledge exhibit a better nutrition profile, fat intake is still above recommended guidelines. On the other hand, UK researchers (see

factor affecting overweight and use quantile regressions to study the effects that it could have on obesity outcomes. To do so, they use a sample of the Taiwanese population and find that the relationship between risk knowledge of obesity and BMI is significant for males, and those around and below the medium BMI distribution tend to be underweight the more health risk knowledge they have. For women, instead, the relationship is not statistically significant throughout the distribution.

**McGeary (2009)** introduces an economic perspective by assessing the effects of state-level nutrition education program funding<sup>122</sup> in the United States. Her findings suggest that an increase in state-level funding results in a 0.006 percent decrease in BMI per year<sup>123</sup>. So, in order to reach a normal range BMI<sup>124</sup>, nutrition education funding should be increased accordingly by about 23 times (going from actual spending, some 1.5 million USD, to 34 million USD over 15 years or 2.27 million USD per year<sup>125</sup>). **Sassi et al (2009)** find that adding health education programs, complemented by appropriate catering services within schools could actually increase fruit and vegetable intake, although dietary changes will diminish after exposure to any programme ends.

So, overall the literature suggests that nutritional education can have an impact on healthy eating and overweight, however the impact is not homogeneous throughout the population since certain groups might be more receptive than others. Furthermore, adequate nutritional education requires a significant increase in funding from governments and ensures that the target population is exposed as long as possible if these types of interventions are expected to have a satisfactory effect on healthy eating.

## 2.4 Nutritional labelling

According to **Sassi et al. (2009)** a nutritional labelling intervention is intended as the disclosure of the nutritional characteristics of food being sold in stores reported as easy-to-read nutrition facts, helping consumers to choose healthier diets, and at the same time, giving incentives to the food industry to reduce serving sizes and/or reformulate their products with healthier nutrients. Food Labelling to Advance Better Education for Life(**FLABEL**), an EU project assessing consumer exposure to nutrition labelling found that the majority of products audited within the EU ( 85%) contained nutrition information of some kind with the highest

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Wardle et al. 2000) analyse the relationship between nutritional knowledge and intake of fruit, vegetables and fat using measures of nutrition knowledge<sup>121</sup> and a postal survey. Their results show that nutritional knowledge is independent of educational level and occupational category, and provide evidence in favour of a positive relationship between nutrition knowledge and consumption of fruits, vegetables and fat.

<sup>122</sup> To do so the author uses a pooled cross-sectional database covering the years 1992-2006 by merging info from the Centre for Disease Control's (CDC) Behavioural Risk Factor Surveillance System (BRFSS) complemented by data from USDA related to funding state-specific nutrition-education programs.

<sup>123</sup> Going from 26.66 kg/m<sup>2</sup> to just 26.51 kg/m<sup>2</sup>.

<sup>124</sup> In the paper the target BMI was set to be 23 kg/m<sup>2</sup>.

<sup>125</sup> Though extrapolations so far outside the data range should be treated with extreme caution.

proportion being in Ireland, UK and The Netherlands (95%) and the lowest in Cyprus and Slovenia (75%). Furthermore, the most wide-spread format across all countries was the nutrition table on back of pack, which states either the big 4 (calories, protein, carbohydrates, fat) or the big 8 (big 4 plus sugar, saturated fat, fibre and sodium/salt).

On the other hand, empirical evidence suggests that only two thirds of consumers actually read labels<sup>126</sup>. So, alternative measures as front-of-the pack label have been proposed and implemented within some countries<sup>127</sup>. Indeed, the European Commission has adopted a proposal for regulation<sup>128</sup> on the provision of food information to consumers aiming to (i) set mandatory nutrition declaration on front of pack, (ii) nutrients must be accompanied by an indication of the percentage of the reference intake value and (iii) voluntary nutritional schemes will be permitted (e.g. traffic light labelling).

**Wills et al. (2009)**<sup>129</sup> studied the penetration of nutritional labelling in Europe and the consumers' actual use of nutrition labels. Their findings indicate that nutrition labelling in the continent is high, with the majority of consumers being able to use the information provided to identify a healthier product. However, just a minority actually looks at this information when shopping, and this is only due to an interest in healthy eating.

From an economic perspective there is an ongoing debate in the literature about the costs and actual health benefits or improvements in nutrition due to nutritional labelling. Some studies show that in general, labelling helps or induces people to avoid bad nutrients, however it does not necessarily encourages people to buy good nutrients<sup>130</sup>. On the other hand, there is evidence supporting the notion that social benefits of labelling offset the costs<sup>131</sup>. In either case, what is clear is that consumers tend to use nutritional labels and the easier and more concise the information is, the higher the probability they will have an impact on food choices. Furthermore, once nutrition labelling regulation is in place, those consumers who tend to use the labelling are more likely to increase fruit and vegetable consumption while decreasing fat intake, (see **Variyam, 2008**).

From an economic perspective, nutrition information is vital to informed choice which is the basis of economic decision making. However, informed choice is not necessarily healthier as pointed out in **Mazzocchi et al. (2009)**—labelling may improve consumers' economic welfare by enabling them to make informed choice while yielding no improvements in diet and health.

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<sup>126</sup> See Sassi et al. (2009) and references therein.

<sup>127</sup> In the UK, some manufacturers have joined the front-of-pack traffic light labeling system suggested by the government. For more details refer to the EATWELL Evaluation of Evaluations Report. We refer interested readers to Stockley (2007) and Grunert & Wills (2007, 2008)

<sup>128</sup> European Commission (2008).

<sup>129</sup> The article presents some of the findings of the EU-funded project FLABEL in which the European Food Information Council (EUFIC) is a partner.

<sup>130</sup> See Garretson and Burton (2000).

<sup>131</sup> See Golan et al. (2001).

## 2.5 Nutritional Information on Menus

Again, **HOPE** and **Sassi et al. (2009)** do not specifically address this argument, so we refer mainly to **Mazzocchi et al. (2009)** and update from there.

Many consumers, researchers and health officials view the restaurant industry as in part responsible for the increase in obesity-related diseases<sup>132</sup> and are pressing for the introduction of nutritional information in traditional and modern take-away restaurant's menus. However, this might prove difficult and controversial<sup>133</sup> and no country has formally regulated or forced the introduction of this type of information in menus, although sometimes private sector initiatives (as the heart beat award in the UK<sup>134</sup>) and local government regulations<sup>135</sup> go in this direction.

**Variyam (2004)** points out that growing consumption and the continuous decreases in the nutritional quality of food-away-from-home is the outcome of economic forces driving supply and demand. On one hand consumers demand taste and convenience, while suppliers deliver by using products that enhance taste, which are not necessarily healthy. Therefore sellers do not have incentives to introduce nutrition information in their menus that could uncover the unhealthiness of their products, and this lack of transparency leads to consumption levels higher than they would be if consumers were informed. However to what extent the introduction of mandatory nutrition information will improve diets and reduce obesity-related diseases is uncertain. Moreover, as pointed out by **Mazzocchi et al (2009)**, a mandatory policy could affect more small restaurants, which may lack the skills and capacity to standardize ingredients and portions, driving most of them out of the market; as a result patrons' options become more restricted.

To conclude, the literature analyzing the effects of nutritional information on menus, so far has no conclusive evidence in favor or against the introduction of such policy. This is due mainly to the fact that the introduction of nutritional information on menus is relatively recent and partial, with only a number of restaurants including the information on their menus.

## 3. Policies aimed at changing the market environment

### 3.1 Fiscal Measures (Taxes/Subsidies)

Fiscal measures are favoured by economists as a way of ensuring that consumers pay the true social cost of the food they consume, including the externality element—the cost imposed by

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<sup>132</sup> See Bates et al. (2009) and references therein

<sup>133</sup> At least in the UK, Stubenitsky et al. (2000) and Variyam (2004) found evidence that the inclusion of low-fat information in the menu of a restaurant was associated with it being chosen less frequently.

<sup>134</sup> See EATWELL “Evaluation of Evaluations” for more details on this and other European Initiatives.

<sup>135</sup> New York City Board of Health requires all the restaurants located under its jurisdiction to show calorie information on their menu and menu boards. The Obama administration is trying to introduce a new requirement for every big restaurant chain in the US to put calorie information on their menus. (See: <http://www.nytimes.com/2010/03/24/business/24menu.html>)

individuals consuming an unhealthy diet on the remainder of society through higher health care costs and lost production as a result of diet-related ill-health.

In Europe, no government has explicitly introduced such measures<sup>136</sup> though many governments operate special differential VAT regimes for food products<sup>137</sup>. In the UK, for example, there is a zero rate for food in general, though not all foods qualify. For example, many specific food items are standard-rated, including alcoholic drinks, confectionery, crisps and savoury snacks, food for catering or hot takeaways, ice cream and soft drinks. However, the VAT regime also applies to ‘healthy’ foods such as ‘smoothies’ (fruit juice drinks).

In the absence of concrete policy interventions of this type, evaluations have been based on simulation using data on the known responsiveness of consumption of different foods to prices.

The use of such economic instruments to prevent obesity has been amply covered by the literature. According to **HOPE’s (2009)** narrative report, studies suggest that taxing fat-dense foods has modest effects on consumer’s diets and overall weight outcomes. We could still have large effects on diets by having huge taxes; however the issue is that fat taxes of *realistic* sizes have only modest effects. Indeed, **Sassi et al. (2009)** point out that fiscal interventions may be complex to design and difficult to enforce, given that the impact of such interventions are unpredictable as the price elasticity of lifestyle commodities varies across individuals and population groups. Much of the fat tax literature is based on estimates of elasticities and simulations of the impact of relative price changes at a considerably aggregated food category level for computational tractability. A major drawback of high levels of aggregation is that substitution within food category levels (e.g. between high and low fat cheese) is not picked up. One exception is **Griffith et al. (2008)** that uses a discrete choice demand model using disaggregated household purchase level data to estimate responses to a fat tax.

In any case, taxation could lead to increases in revenues that could be used in the form of subsidies to foster initiatives to improve diets. However, the introduction of taxes without subsidies has been criticised as regressive since it would be a particular burden for low-income consumers who spend a higher proportion of their incomes on food, particularly on the types of foods likely to be targeted by taxes.

**Allais et al (2009)** find similar results for French households. They simulate a fat tax on nutrients purchased by French households and their results suggest that such taxes may have only a small effect on nutrients purchased with a consequent mild effect on body weight (at least in the short run, although greater in the long-run). Although in principle such a tax might generate a large revenue that could be used to support healthy programs, it could exacerbate nutritional disparities among consumers making it unacceptably regressive.

HOPE identifies the major benefits of fiscal interventions as modest improvements in diet, clear signals to the supply chain and revenue raising. Negative effects are the potential

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<sup>136</sup> Romania is the first EU member to start outlining a plan to tax salty, fatty and sugary food. The Health Minister, Attila Cseke, has setup a nutrition commission with the aim of raising £860 million from the planned tax on fast food. (<http://www.timesonline.co.uk/tol/news/world/europe/article6990411.ece>)

<sup>137</sup> We refer interested readers to an excellent systemic review on food taxes by Caraher and Cowburn (2005).

regressive nature of fiscal measures, the administrative burden and the possibility of unintended (and unspecified) consequences.

In the US, **Chouinard et al. (2007)** simulate a *fat tax* using as threshold the fat percentage in dairy products. So, assuming a 10 percent tax rate, their findings show that overall dairy fat intake is reduced by less than 1 percent, while the burden, again as before, falls mostly on low-income households being ten times bigger for those families with an annual income of \$20,000 USD than for those with annual income around \$100,000 USD<sup>138</sup>. **Smed et al. (2007)** use weekly Danish household food consumption data and study the effects that various tax and subsidy schemes<sup>139</sup> would have on different age groups and social classes<sup>140</sup>. Their results indicate that across socio-demographic groups, lower social classes are more responsive to taxes having the greatest improvements in diet composition. Looking solely at age groups, it is the youngest that decrease their demand for saturated fat in response to price changes, while the middle-age group is more price responsive in its demand for sugar. So on average they find evidence that taxes may be effective in improving diets. They also show that when combined with subsidies on healthy eating (fiber in their case), the regime need not be regressive.

In Spain, differently from Northern and Central European countries, it is the rural and lower education households who have a higher quality diet (much closer to the Mediterranean diet). However, the effects of fat taxes and subsidies are pretty much in line with the rest of the continent. **Gil et al. (2009)** simulate the effects that subsidies on fruit and vegetables, and taxes on meat could have on the overall dietary quality in Spain. Their results show that such interventions (taxes/subsidies) have a small effect on food demand<sup>141</sup>. Nevertheless, the increase in tax revenues could provide additional funds to finance educational campaigns and health policies.

*Fat taxes* on unhealthy foods might be matched by thin subsidies to encourage consumption of healthy foods, notably fruit and vegetables<sup>142</sup>. **Cash et al. (2005)** simulate the effects that “*thin subsidies*” covering fruits and vegetables might have in the US. Their results show that a 1 percent decrease on price for all fruits and vegetables could translate into a mean decrease of around 6,700 cases of coronary heart disease and almost 3,000 ischemic strokes. Furthermore, poor consumers tend to eat less fruit and vegetables, and are more responsive to any *subsidies* and more likely to change their diets than other individuals.

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<sup>138</sup> The burden is 0.24 percent for families living on an annual income of \$20,000 while it is just 0.024 percent for those families living on an annual income of \$100,000.

<sup>139</sup> In the study they focus mainly on saturated fats, fibre and sugar.

<sup>140</sup> The socio-demographic groups include 7 age groups (19-24,25-34,35-44,45-54,55-64,65-74,75-80) and 5 social classes (1,2,3,4,5) where 1 can be seen as the upper class and 5 the lowest social class (unskilled blue-collar workers, unemployed, pensioners, etc.).

<sup>141</sup> It is worth noting that Gil et al (2009) used a Quality of diet index in their simulations and set a VAT decrease in fruits and vegetables going from 4 percent to 1 percent, while they increase meat VAT from 7 percent to 16 percent.

<sup>142</sup> Martin (2005) recalls that Brownell’s proposal (see footnote 1) could be interpreted as a double tax model, where positive taxes are applied to unhealthy food, while negative taxes (subsidies) are applied to healthy foods. This has the final aim of promoting healthy choices and using the revenues gathered from the taxation of unhealthy food to offer low-cost fruits and vegetables where they are needed the most.

Further evidence is provided by **Powell and Chaloupka (2009)**. They examine a series of articles dealing with food and restaurant price sensitivity of weight outcomes in the context of taxes or subsidies and the effects that these might have on changing consumption patterns. The evidence that they gather shows that small taxes or subsidies produce only slight or not significant changes in obesity. However, more vigorous interventions in the form of subsidies targeting poor households may have positive measurable effects on weight outcomes. Furthermore, they find evidence in favour of a dual approach. That is taxing unhealthy food on one hand, and subsidizing healthier foods on the other. A recent example can be found in **Nordström and Thunström (2009)**. They simulate the effects of tax reforms to encourage healthier grain consumption in Sweden. Their results show that in order to reach an increase of 38 percent in fiber intake (the increase needed to achieve the Swedish National Food Administration recommendations) a subsidy of 50 percent in wholesome bread and breakfast cereals is required. However, the implementation of such a subsidy is accompanied by undesired increases in other nutrients such as fat, salt and sugar. So, in order to limit these negative effects they propose to simultaneously tax unhealthy nutrients or foods (ready meals, bakery products, etc.) to fund the subsidies and limit increases in unhealthy food consumption. **Yaniv et al. (2009)** study the adverse consequences that a *fat tax* could have in three types of individuals: (i) non-weight conscious, (ii) weight-conscious but not physically active, and (iii) weight-conscious and physically active. Their results show that *fat taxes* would unambiguously reduce obesity for non-weight conscious individuals; however, surprisingly this is not necessarily the case for weight-conscious individuals<sup>143</sup>.

Another issue that arises from the introduction of *fat taxes* is how much and what should or could be done with the expected increase in revenues obtained from the imposition of such taxes. Indeed, in some cases the amount generated from a small levy on targeted products, like soft drinks or snacks, could raise annually as much as \$1 billion USD in the United States. **Jacobson and Brownell (2000)** analyse the issue and suggest using the money obtained from taxing unhealthy food to fund health promotion programs. After all, small taxes of a couple of cents are not big enough to affect sales or upset consumers, but the revenues could be redirected to health programmes. Their estimates show that a 1 cent tax on 12-oz soft drinks could produce annually \$1.5 billion USD in revenues for the government. If we add some “*cent*” taxes to other unhealthy foods (snacks, chips, candy, etc.) there could be a windfall of another additional \$300 million USD that could again be channelled to appropriate healthy eating programmes.

To conclude, the fiscal interventions reviewed are a direct way to make individuals pay the social costs of their food. However, actual *fat taxes* and *thin subsidies* have not been implemented anywhere so there is no actual evidence of their effectiveness and applicability. In general, the above review suggests that a small tax on certain foods, even if not inducing behaviour change, could raise valuable funds for health promoting interventions. Finally, *fat taxes* distributional effects might be regressive<sup>144</sup>, although the health effects are progressive.

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<sup>143</sup> A fat tax could increase obesity. The explanation relies on the fact that weight is gained when calorie intake is bigger than calories burn through physical activity. A fat tax that reduces junk food consumption could “in principle” encourage the preparation of healthy meals which is however time consuming at the expense of physical activity. Hence, obesity could rise even in the presence of a decrease of junk food consumption.

<sup>144</sup> Appropriate subsidises may compensate for this, see Smed et al. (2007).

### 3.2 Subsidies (e.g. vouchers) to disadvantaged consumers

Our main references, the **HOPE** report and **Sassi et al. (2009)** do not cover these types of interventions, so we refer to **Mazzocchi, Traill and Shogren (2009)** and recent research papers addressing this issue.

**Mazzocchi et al. (2009)** find that the evidence on this type of intervention is mixed and in general weak, plus the gap in body weight between participants and eligible non-participants for food vouchers has shrunk over time, leading economists to be sceptical about those linking the existing price support policies and food subsidies as a cause for obesity.

The main idea behind food vouchers is that many poor people have poor diets, sometimes, it is claimed, because they cannot afford healthy food.

Within Europe, the UK has a food voucher scheme called Healthy Start, where eligible families<sup>145</sup> get free vouchers every week which they can swap for milk, fresh fruit, fresh vegetables and infant formula milk. These vouchers can be spent with participating retailers including small businesses and milkmen as well as larger supermarkets and chemists<sup>146</sup>.

In the US, a wider food voucher programme is in place and is called the Supplemental Nutrition Assistance Program (SNAP), previously known as the food stamp program (FSP). The FSP, now SNAP was originally designed to encourage the consumption of any surplus from farm commodities by redirecting them to poor and ill fed people within the country, as well as acting as a welfare scheme for poor families unable to afford an adequate diet<sup>147</sup>. Households with income at or below 130 per cent of the poverty line are eligible for food stamps, with circa 50 percent of the eligible individuals usually participating in the program<sup>148</sup>. In 2005, 11 million households participated in the FSP with average benefits around \$200 US dollars per household per month. Differently from other food programs around the world, the US FSP is not that restrictive in the food that can be swapped for the “vouchers” so participants can use the subsidy to consume energy dense foods and beverages (snacks, prepared foods, fried meat, poultry or fish products, etc.).

**Zagorsky and Smith (2009)** investigate whether the U.S. Food Stamp Program contributes to participants’ weight gain. Their findings suggest that female participants tend to gain weight (on average, 2.6 kg) and that the longer they participate the greater the BMI. This results

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<sup>145</sup> Families with a child under four years old and who are on certain benefits will qualify for Healthy Start and receive one voucher a week. Children under one year old will get two vouchers a week. All pregnant women under the age of 18 will qualify, regardless of whether they are on benefits. The vouchers are currently worth £3.10 each.

<sup>146</sup> In the US the Women, infants and children (WIC) programme provides federal grants to States for supplemental foods, health care referrals, and nutrition education for low-income pregnant, breastfeeding, and non-breastfeeding postpartum women, and to infants and children up to age five who are found to be at nutritional risk. (<http://www.fns.usda.gov/wic/>)

<sup>147</sup> For more detail on the US FSP we refer interested reader to US Department of Agriculture <http://www.fns.usda.gov/>

<sup>148</sup> See Cunnyingham (2004)

might be due to the current structure of the FSP and the authors encourage its revision to address the negative spillovers (obesity) associated to the program.

Along the same lines, **Alston et al. (2009)** suggest that the FSP should be revised and that participants into the program should be allowed only to buy healthy food. To assess the effects of introducing such restrictions they used a model of consumer choice. Their results indicate that if the FSP is revised (by allowing only healthy food options), participants would increase their consumption of healthy foods, with an expected gradual reduction in obesity rates among FSP participants, nevertheless from an economic perspective the overall effects of such intervention are difficult to assess and may have unpredicted spillovers. Restricting food choices within the FSP could induce price changes which might result in declines of healthy food consumption by other consumers. Furthermore, restricting the type of food that can be purchased through then FSP might make the scheme less attractive and the number of participants could decline consequently reducing the positive effects of the initial intervention. On the other hand, **Guthrie et al. (2007)** explain that the use of vouchers in order to encourage consumption of healthy food (fruits and vegetables) in combination with complementary policies would be a better strategy than restricting purchases of unhealthy foods with food stamps<sup>149</sup>.

From another perspective, **Lin et al (2009)** examine the cost effectiveness of two economic policies (price subsidies and food stamps) in the US that use alternative policy levers available within the Supplemental Nutrition Assistance Program to increase consumption of fruits, vegetables and dairy products. In order to do so, they estimate food demand elasticities and use their results to measure the amount of monetary incentives needed to reduce the gap in healthy food consumption. Their results suggest that a 10 percent price subsidy would curtail consumption deficiencies of fruits and vegetables by 4 to 7 percent at an estimated cost of \$734 million a year. On the other hand if the same amount is used to finance food stamp benefits, consumption deficiencies are predicted to narrow by only 0.35 to 0.40 percent, suggesting that direct subsidies are a slightly better alternative to food stamps.

Overall, the literature suggests that in order for food subsidies or vouchers to be effective and to reduce obesity rates, the types of food included in the scheme should exclude unhealthy options at all. In alternative, providing direct subsidies encouraging healthy eating are preferable to food stamps or related vouchers.

### **3.3 School or workplace food availability**

The school environment exerts huge influence on students' dietary habits. So, if we take into account that most developed countries tend to offer school meals for free or at subsidized prices to their students and that food availability in schools is often complemented by several kiosks or vending machines usually offering a wide range of snacks and soft drinks high in sugar, fat and caloric content, we can easily realize the potential for intervention in this area.

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<sup>149</sup> Webber et al. (2010) conducted a qualitative research in low-income adults in charge of purchasing the food for their household to find out shopping habits and attitudes toward local food stores finding that consumers were concerned mainly with store venue; internal store environment; product quality; product price; and relationships with the stores. Furthermore, their findings suggest that even if reforming the FSP may lead to healthier eating among participants, its effect will be limited unless accompanied by additional policy instruments.

With growing concerns regarding childhood obesity rates, and supported by the idea that school nutrition practices have consequent effects in adult food consumption, the school environment has been targeted by calls to impose stricter regulation on the type of food made available to children within school hours.

The response by health authorities has been varied amongst countries, ranging from improvements in the nutrition quality of meals, increased offer of fruits and vegetables, banning vending machines or supply of healthier snacks<sup>150</sup>.

However, so far there are no cost-effectiveness studies and the links between obesity rates and school meals regulation need more research<sup>151</sup>. **Story et al. (2009)** analyse policies related to food and physical activity standards in schools across the United States. They find that, in general, US children do not consume diets that meet national dietary guidelines thus leaving space for the introduction of stronger policies regulating the quality of the food available in<sup>152</sup>. Along the same lines, **Newman et al. (2009)** in an attempt to identify effective ways to improve nutritional quality in schools, assess the quality of US subsidized school meals<sup>153</sup> by comparing school meals that meet total fat requirements to those that do not. Some of their findings suggest that although some schools may offer meals that satisfy nutritional guidelines, permitting the sale of competitive foods or foods that bypass nutritional standards would indirectly affect school meals, since these types of food appeal to students' taste preferences, therefore diluting the effects of adequate meals provided by the school.

On the other hand, some studies<sup>154</sup> suggest that environmental factors in schools (financial pressure on schools, accountability regulations, population growth, etc.) could be used as predictors of whether schools make junk food available or allow food and drink advertisement. Furthermore, children with at least one obese parent which are exposed to an

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<sup>150</sup> Some examples include: the British *Junk Food Ban*; the Swedish Good Food in institutions, in schools, at works; the Greek Nutrition guidelines for food canteens; rules imposed on vending machines placed in schools for the inclusion of healthy snacks were introduced in Spain and Italy, while the distribution of fruit or other healthy snacks to schoolchildren, in countries like Denmark, Norway, Belgium, France and Italy. Outside Europe, in 2000, 43 percent of the US elementary schools, 89.4 percent of middle/junior high and 98.2 percent of senior high schools had either a vending machines or a school store, canteen, or snack bar where students could purchase "competitive foods" (term used mainly by US researchers to refer to foods with minimal nutrition value) or beverages. Since 2003, most US states have enacted regulations concerning vending machines in schools. In Japan school meals have been subject to food standards since 1954, with strict limits on fats and a ban on vending machines. While in some states in Australia and New Zealand they have banned high fat, sugar food and beverages from school canteens.

<sup>151</sup> See Jaime and Lock (2009).

<sup>152</sup> Recently the Obama administration, in words of its Agriculture Secretary, Tom Vilsack, decided to ask the US congress for the removal of school vending machines of sugary snacks and drinks. See the press release at: [www.msnbc.msn.com/id/35299173/](http://www.msnbc.msn.com/id/35299173/). This is not entirely new, indeed as early as 2005, some 17 US states had already enacted some type of legislation over vending machines in schools, however, some critics say that they were more apparent than real (see Oliver 2006). On the other hand the first Lady, Michelle Obama, has endorsed a new campaign, called "Let's Move" design to [give parents support](#) on health and food issues, provide [healthier food in schools](#), encourage children to be [more active](#), and make [healthy, affordable food](#) available in every part of our country. <http://www.letsmove.gov/>

<sup>153</sup> The Report uses School-level data from the School Nutrition Dietary Assessment-III.

<sup>154</sup> See Mazzocchi et al (2009) and references therein.

increase in junk food availability at school are more likely to experience increases in BMI, while children with both parents under the normal-weight category tend to show no increase in BMI when exposed to an increase in junk food availability.

There is also a strong cultural component behind diets, indeed some Mediterranean countries (Italy, France) have strong food traditions, so if children's environment and upbringing before school sets concrete preferences to lead them, when at school they might not prefer junk food even if available.

If we focus only on adults, **Sassi et al (2009)** find evidence that workplace interventions increase consumption of fruit and vegetables as well as physical activity with corresponding decreases in fat intakes. Furthermore, after retirement, those that were exposed to workplace interventions seemed to retain some of the benefits.

**Mazzocchi et al (2009)** highlight that in Finland, the government has influenced diets through the provision of healthy meals, e.g. mass catering is key to their nutrition policy and might have actually be responsible for teaching the Finns to eat vegetables; those who eat at staff canteens are said to eat more vegetables, fish and boiled potatoes. Given that in Finland most women work, catering at the workplace is rather usual (workplace meal provisions are usually included in trade union agreements in both the public and private sector) plus nutritional guidelines have been in place since the 1970s and are said to be closely followed, in particular in the public sector.

Summarizing, dealing with children's school canteens it is always difficult to isolate the influences of parents, the environment outside schools and the environment inside schools. Therefore, evaluating the impact of a particular intervention is complicated. Nevertheless, in general the previous literature coincides in pointing out that the school environment matters and that efforts should be made to encourage pupils to undertake a healthy lifestyle which includes healthy eating. From an adults perspective, although some country specific examples are encouraging it is clear there is no "*one size fits all*" intervention at the workplace, however what emerges from some of the articles reviewed is that adequate policies that encourage healthy eating inside and outside the work environment consistently for long periods of time can have the desired outcome of improving diets and reducing obesity.

### 3.4 Nutrition-related standards

Nutrition related standards include portion sizes, standards on trans fats, salt, saturated fats, and sugar. However, our main references, the **HOPE** report and **Sassi et al. (2009)** do not cover these types of interventions, and academic literature is scarce, so we refer to recent research papers addressing some of these issues.

One issue related to current unhealthy eating habits and growing obesity trends has to do with food portion sizes. Large portion sizes may induce increased calorie intake, particularly if accompanied by economic incentives, for example through value size pricing<sup>155</sup>. The bigger

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<sup>155</sup> From an economic point of view, consumers will prefer to pay less for more, thus lower unit prices for larger portions will make them more attractive to consumers, rather than paying more, in relative size prices for a smaller food portion.

the portion the less you pay per unit. Furthermore, portion sizes have been increasing over the last decades, particularly in the United States, where, super-sizing, mainly in fast food restaurants, has been blamed for increased energy intake, overweight and weight gain<sup>156</sup>.

**Vermeer et al. (2009a)** provide evidence that portion-size interventions may have support by food sellers, if it comes in the form of larger variety of portion-sizes supported with portion-size information.

However, **Vermeer et al. (2009b)** found evidence that linear pricing might be the answer to countering the effects of super-sizing. Their evidence suggest that when confronted with proportional pricing, overweight fast food consumers are more likely to choose small food portion sizes and less likely to choose large soft drink sizes. This is not the case among all consumers, since proportional pricing did not reduce all consumers' size choices. Nevertheless, existing pricing strategies seem to prevent overweight and obese consumers from selecting a more appropriate portion size of soft drink and high caloric snacks.

On the other hand, mandatory food standards on nutrients other than those regulated by food safety law is not common in Europe, one reason behind this might be due to potentially high financial costs for the private sector. **L'Abbe et al. (2009)** review the approaches being followed in various countries to remove trans fats from their food supply. Their review shows that a number of governments are actively engaged in reducing trans-fatty acid (TFA) intakes using a variety of methods, ranging from nutrition recommendations, programs to raise awareness about the adverse effects of TFAs, voluntary or mandatory labelling of the trans content in foods, voluntary or mandatory programmes to encourage or force industry to reformulate food products to remove TFAs, the promotion of health and agricultural policies that encourage the production of alternatives to trans fats and mandatory regulation of food standards to remove TFA content. In Europe, Denmark has introduced regulatory limits on TFAs, while in the US, several cities have done the same, in particular New York and more recently California has become the first state to ban the use of trans fat contained cooking oils (the new law came into effect in January 1<sup>st</sup> 2010). The new regulations imply that oils, margarines and shortenings typically used in frying must now contain less than 0.5 percent trans fat per serving. Those food manufacturers and/or restaurants that violate the legislation will face fines of up to \$1,000<sup>157</sup>.

**L'Abbe et al. (2009)** also identify the factors that in their opinion are behind the success of certain approaches. To start they identify the need of national experts that study the problem and provide concrete recommendation. Second, the role of the media; rising awareness and facilitating or encouraging the industry to change is not to be underestimated. Third, consumer awareness and sustained demand for industry change, complemented in some cases by government involvement to ensure product reformulation by the industry.

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<sup>156</sup> See Kral and Rolls, 2004; McCrory et al. (2000); Jeffery et al., 2006; Pereira et al., 2005

<sup>157</sup> The ban was signed into law in July 2008, but was not put into practice until the beginning of 2010 in order to allow manufacturers time to reformulate with alternative fats and oils. Exceptions to the state-wide ban include baked and deep-fried items, with manufacturers having until 2011 to switch from artificial trans fats. See: <http://www.foodnavigator-usa.com/Legislation/Californian-trans-fat-ban-takes-effect>

### 3.5 Policy interventions not explicitly targeted at healthy eating but relevant.

There is growing concern that many policies, not necessarily directly aimed at healthy nutrition, e.g. agricultural policy, are affecting indirectly food consumption patterns across the United States and Europe; consequently contributing to rises in overweight and obesity-related diseases. **HOPE (2009)** points out that the role of food production together with its relative policies and subsidies has come under greater scrutiny as research linking food and health continues to evolve.

In Europe, the Common Agricultural Policy (CAP) in particular influences relative food prices, but its effect has primarily been to raise consumer prices of dairy products and sugar, which should promote healthier eating (Ritson or Mazzocchi et al). Some authors<sup>158</sup>. **Prattala (2003)** supports this argument. He explains that Finland's state support for dairy products before joining the EU in 1995 kept low the prices of high saturated-fat products, while after accession the spread between margarine and reduced-fat fall with respect to butter contributing to reductions in saturated-fat consumption.

In the United States, food subsidies have changed prices of certain farm commodities (e.g. soybeans, corn, etc.) that have made them cheaper with respect to healthier alternatives such as fruits and vegetables. Moreover, the reduction in price of certain "less" healthy commodities has incentivised the food industry to use them as ingredients for their products, contributing to over-consumption.

However, **Alston et al. (2008)** point out that subsidy policies in the United States have hundreds of provisions for particular commodities that could lead to both, increases or decreases in commodity prices. Thus their impact on nutrition and obesity trends is uncertain. In their study they argue that in order for any particular agricultural policy to have a real effect on obesity the policy needs to be proven to have reduced the price of inputs being used in the production of unhealthy or fattening foods; to have substantially reduced the prices being paid for those foods, and consumers would need to be responsive to these lower prices, and as a result increase their consumption of these types of foods. Yet, they only found modest evidence supporting any of the later arguments. In the same lines, **Miller and Coble (2007)** run a study analysing farm subsidies and their relationship to retail food prices, although they also estimate total factor productivity (TFP), providing evidence that lower food prices are the result of increases in agricultural efficiency, rather than farm subsidies<sup>159</sup>.

Another indirect policy intervention could be through Value added taxes (VAT), indeed differential taxes applied to various types of foods may reduce the cost of healthy nutritious foods relative to other food products<sup>160</sup>. If we look at the Value Added Tax (VAT) in the UK

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<sup>158</sup> see Ritson (1991,1998)

<sup>159</sup> Further evidence is provided by Beghin and Jensen (2008). He shows that commodity programs have actually raised the price of sugar and reduced the price of corn. Even more, research and development contributed to reduce the costs of corn production more substantially compared to sugar production, with the consequence of making fructose corn syrup an inexpensive substitute for sugar in food.

<sup>160</sup> See Walton et al. (2009)

we can see that it is applied to some “treat foods”(processed food up to a certain degree) but not to the majority of foods (in general food VAT in the UK is zero). In contrast, Australia and New Zealand have a slightly different system. Australia’s Goods and Services Tax is excluded from most foods while in New Zealand there is currently a 12.5 percent goods and services tax on all food which could be reduced or removed for some foods, promoting or encouraging healthy eating.

To summarize, arguments linking obesity and agricultural subsidies present mixed evidence, although in general economists tend to be more sceptical that agricultural subsidies or policies are to blame for unhealthy habits. Rather, researchers tend to favour the thesis that increases in production efficiency and continuing research and development in the agricultural sector are to blame for a more significant impact on prices and consumption<sup>161</sup>. In we focus on other interventions as the VAT systems around the world, we can see that they can be used to encourage or reduce the price of healthier options with respect to unhealthy foods.

#### **4. Conclusions**

The determinants of eating habits and obesity are multi-factorial, strongly dependant on the environment in which people interact and have the characteristic of affecting all groups of society, regardless age and socio-economic status.

So, in the previous sections of this report we assessed previous academic literature addressing interventions to tackle healthy eating and obesity in order to evaluate their effectiveness and applicability. Differently from previous reviews, our scope is more specific in the number of policies being reviewed and has the advantage of covering them all under one single document, which has enabled us to draw conclusions having a wider picture of what has been attempted in several fields.

Following our classification we have separated the interventions into two groups, one covering policy interventions supporting informed choice and the other of policies aimed at changing the market environment.

From our analysis, it emerged that when improving informed, the interventions actually implemented by governments seem to suggest that reducing or banning completely unhealthy food advertisements (in particular those aimed to children) have a positive effect reducing overweight. However, this effect could be diluted if the food industry substitutes television advertising with other forms of marketing. On the other hand public information campaigns have been successful in raising awareness related to healthy eating and its problems; but have failed translating the message into action. This might be explained in part by the long periods of time needed to really achieve changes in attitudes among people and through society, since social marketing campaigns could take as long as decades to have a real impact, and would need adequate and constant funding from governments for a long period of time.

Regarding nutritional education, the literature suggest that it can have an impact on healthy eating and overweight, however the impact is not homogeneous throughout the population since certain groups might be more receptive than others. Furthermore, adequate nutritional education requires a significant increase in funding from governments, plus it needs to ensure that the target population is exposed as long as possible in order to have a satisfactory effects.

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<sup>161</sup> We refer interest readers that want to get more information regarding research and development in the agricultural sector and its effects on food ingredients to several studies by Alston et al. (2009)

From an economic perspective, nutrition information is vital to informed choice which is the basis of economic decision making. However, informed choice is not necessarily healthier, in the sense that people, even knowing or being able to read and interpret nutrition labelling in the food they buy does not necessarily consume more or less quantities of unhealthy food, therefore the improvements in diet and health might be minor. Finally, the literature analyzing the effects of nutritional information on menus, so far has no conclusive evidence in favor or against the introduction of such policy. This is due mainly to the fact that the introduction of nutritional information on menus is relatively recent and partial, with only a number of restaurants including the information on their menus.

If we focus only on interventions targeting the market environment, the most controversial argument are fat taxes, which are a direct way to make individuals pay the social costs of their food. However, actual *fat taxes* and *thin subsidies* have not been implemented anywhere so there is no actual evidence of their effectiveness and applicability. In general, our review suggests that a small tax on certain foods, even if not inducing behaviour change, could raise valuable funds for health promoting interventions. However, *fat taxes* distributional effects might be regressive, although the health effects are progressive. Alternatively, providing food vouchers can have effects on weight outcomes, how effective they are will depend on the types of food included in the scheme; although, providing direct subsidies encouraging healthy eating might be preferable to food stamps or related vouchers.

When it comes to regulating school meals, it is always difficult to isolate the influences of parents, the environment outside schools and the environment inside schools. Therefore, evaluating the impact of a particular intervention is complicated. Nevertheless, in general the previous literature coincides in pointing out that the school environment matters and that efforts should be made to encourage pupils to undertake a healthy lifestyle which includes healthy eating. From an adults perspective, although some country specific examples are encouraging it is clear there is no “*one size fits all*” intervention at the workplace, however what emerges from some of the articles reviewed is that adequate policies that encourage healthy eating inside and outside the work environment consistently for long periods of time can have the desired outcome of improving diets and reducing obesity.

Nutrition-related standards have been applied in some countries with the literature highlighting that behind the success of this type of interventions lies a group of national experts that study the problem and provide concrete recommendations, sustained by an active role of the media by rising awareness and facilitating or encouraging the industry to change. Consumer awareness is vital in keeping a sustained demand for industry to change, and adequate government involvement to ensure product reformulation by the industry.

Finally, when analyzing the evidence of policy interventions that indirectly affect healthy eating, e.g. the CAP and the VAT policies, economists tend to be more sceptical that agricultural subsidies or policies are to blame for unhealthy habits. Rather, researchers tend to favour the thesis that increases in production efficiency and continuing research and development in the agricultural sector are to blame for a more significant impact on prices and consumption. In we focus on other interventions as the VAT systems around the world, we can see that they can be used to encourage or reduce the price of healthier options with respect to unhealthy foods.

To conclude, as mentioned before, healthy eating determinants are multi-factorial, while the current obesity trends are encouraged by obesogenic environments where junk food is readily available at low costs and marketing campaigns bombard the public constantly to induce them to consume unhealthy brands. So, after reviewing the evidence provided by previous reports and systematic reviews it emerges that interventions that focus or target a narrow group of the population will have limited success changing eating habits. Furthermore, the lack of adequate funding and continuity of the interventions reduces the impact and effectiveness of any policy. Therefore, the best strategy would be to target various determinants with an appropriate mix of interventions that cover various population groups for long periods of time.

So, in order for an intervention to be successful in improving nutrition and reducing obesity it needs to take into account the following factors:

- Time: interventions take time to really have an impact. Changing habits, especially eating habits is rather a difficult and long process which cannot occur in very short periods of time.
- Coverage: targeting as much populations groups as possible, although not necessarily with the same type of intervention, will improve the chances of success. Making aware children of the need to eat healthy in schools is not enough if their parents do not continue this message at home.
- Complementarities: a mix of interventions. Making people aware of the need to eat healthy or make them aware of the risks associated to overweight is not enough if supermarkets in their area do not sell healthy food or if unhealthy food is considerable cheaper compared to healthier options.

Policy interventions will need to offer consumers an informed choice and in case they decide to go for a healthier diet, the appropriate monetary incentives should allow the consumer to do so. Therefore, one possible intervention mix could include appropriate *information campaigns*, with enough funding to reach big shares of population for a prolonged period of time, flanked by adequate *market incentives*.

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