



Effectiveness of Policy Interventions
to Promote **Healthy Eating** and
Recommendations for Future Action:
Evidence from the **EATWELL Project**

Deliverable 5.1

www.eatwellproject.eu

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EXECUTIVE SUMMARY

The EATWELL Project

The EATWELL research project, was launched in April 2009 and will finish in March 2013. Funded by the European Commission under Framework Programme 7, its primary objective was to improve nutrition policy in the EU and Member States by providing scientifically sound evidence on the effectiveness of past interventions. To achieve this objective EATWELL partners have:

- Benchmarked diet and health related policy interventions in Member States, the EU and elsewhere as relevant
- Drawn on models of consumer behaviour from psychology and economics and undertaken fresh quantitative analysis of national-level datasets to assess the impact of interventions on consumers' behaviour, diets and health in the short and long terms
- Made recommendations on the form, frequency and coverage of data that should be collected and methods applied to enable effective policy evaluation
- Determined lessons the public sector can learn from the experiences of the private sector in the promotion of healthy eating
- Assessed public, private and other stakeholder acceptance of alternative forms of intervention

This Deliverable reports the primary recommendations to the EU and Member States and the evidence and rationale for the recommendations.

Methods

Healthy eating was defined as adherence to WHO food and nutrient recommendations and maintenance of a healthy weight. Our definition of nutrition policy refers only to measures that can be taken at the 'macro' level by national (or transnational) governments or by major regions within nations; we therefore exclude the multitude of community-level measures taken within doctor's surgeries and community organisations.

We began by identifying and classifying Member State nutrition policy interventions and determining whether they had been evaluated for effectiveness (do they work?) and cost effectiveness (are they good value for money?). When the number of EU interventions in a particular category was small we looked beyond the EU for further evidence. We also reviewed evidence of policy effectiveness and cost-effectiveness from the international peer-reviewed literature and from reports by Governments and NGOs and undertook a number of statistical case studies within the project. We established sound evaluation principles including a focus on meaningful target variables such as health or diet rather than simply attitudes and knowledge, appropriate application of statistical principles, ability to focus on relevant population segments, consideration of long as well as short-term outcomes, and an assessment of both social and private costs and benefits of intervention.

We conducted a representative survey of over 3000 citizens in 5 EU countries to assess acceptance and willingness to pay (through taxation) for alternative policies. On the basis of our analysis of interventions and their evaluation and survey findings on acceptability, initial policy recommendations were formed by project partners, revised following discussion with the project's Stakeholder Advisory Panel, then exposed to stakeholders (consumer groups, policy makers, industry and academics in 4 country workshops). This led to the modification and the finalisation of recommendations presented in this document.

Policy classification

Policy interventions were classified first into two broad categories: measures to enable informed choice through provision or control of information flows and education; and market intervention measures that directly influence food availability and/or prices. A large majority (around 2/3) of policies are information measures, notably nutrition education in schools, social marketing campaigns and, to a more limited extent, advertising controls and labelling. The most common market intervention methods are regulation of the nutritional composition of school meals, followed by Government action to encourage the private sector to improve diets, notably through reformulation of processed foods. Less common are the use of fiscal incentives, nutrition-related standards and measures to improve healthy food availability for disadvantaged consumers.

Cautionary notes on the evidence base

In providing evidence on policy effectiveness and cost effectiveness it has been necessary to be reductionist and present the evidence for each type of policy in turn. It is probable that there are positive synergies between policies, for example education and information measures linked to actions to promote product reformulation. It has not been possible to assess whether combinations of policies would work better than the sum of their parts (there is no evidence-base), but stakeholders consider this to be important.

Most of the interventions to improve diets are recent so the evidence base often turns out to be quite weak, especially concerning long-term implications. However, policy makers still need to make decisions, so the partial evidence we provide in this report is a useful guide. We have indicated the strength of the evidence whenever possible.

Findings and recommendations for policies supporting informed choice

In general, information measures have a small but positive effect on healthy eating and, because they are relatively cheap, they are generally cost-effective. They are also well accepted by the public and stakeholders.

It is important to recognise that informed choices are not necessarily healthy choices—multiple factors other than nutrition and health influence what people choose to eat. Thus a perfectly informed and fully educated populace will still impose social costs of unhealthy eating because diet-related ill health raises health care costs and causes lost economic output.

Although there have been many information and education interventions, a number of improvements would be desirable. Our recommendations are:

Advertising controls

- Partially restricting advertising of unhealthy foods through children's TV programmes (i.e. restrictions only covering certain channels or programmes) has had only a small effect on diets. A broader approach encompassing all TV channels as well as other media may be more effective. We recommend investment in building the evidence base on this, via further experimental studies, or where the opportunity presents itself, by introducing legislation and planning rigorous impact evaluation around it.
- Regulation of food advertising to adults has very low support amongst the European population, and adults in any case are less susceptible to promotion than children. Thus regulation of advertising to adults is not recommended.

Social marketing

- We recommend continued use of public information campaigns, with the proviso that investment be long term in order to sustain effects on behaviour.
- These sustained campaigns could benefit from incorporating key success factors of commercial marketing and best practice social marketing as identified in the EATWELL project. The success factors are, amongst others, greater awareness of trends that campaigns could react to, appealing to citizens emotionally by e.g. stressing the 'simplicity' and 'naturalness' of healthy food, engaging and involving consumers based on common values and in communities of different kinds, using media targeted strategically and specifying short-term gains of healthy eating alongside better health.
- Too many current campaigns are short-lived and thus of limited use. This multitude of short-term campaigns should be rationalised to fund a smaller number of campaigns with larger and longer-term investments.
- Public information campaigns may work best when implemented in synergy with other measures, such as increasing availability, labelling or reformulation. This is already the practice in many programmes and deserves to be continued. Commercial marketing's trend to a more integrated marketing communication underlines the value of synergy.

Nutrition education

- Nutrition education should be a compulsory component of school curricula in all EU countries and efforts should be made to improve the attractiveness of its provision and ensure messages are enhanced with information on healthy lifestyles and the provision of attractive and healthy food in school canteens.
- Governments should take a lead in ensuring their own public sector workplaces encourage healthy lifestyles which include the provision of information and healthy options in canteen meals. They should evaluate the effectiveness of alternative approaches with a view to helping establish best practice.

Nutrition labelling

- Since nutrition label use is limited by motivation and attention and more consumers look front-of-pack, we would encourage the (initially voluntary) provision of simple information on the front-of-pack, in a consistent format and positioning. This should be based on insights from consumer research and eye-tracking technology. The effectiveness of colour-coding or a health logo should be further evaluated.
- Nutrition labelling should be combined with initiatives targeting health motivation and education of the labelling scheme of choice.
- The provision of nutrition information in food restaurant chains is recommended for informed choice and the potential for positive menu changes. To strengthen the evidence-base, menu labelling in the US and other real-life experiments should be closely monitored. Introduction of such an intervention should be implemented in a way that allows rigorous evaluation including the technical challenges faced by caterers in providing nutrition information.
- Menu labelling should also be combined with initiatives targeting health motivation and education of the labelling scheme of choice.
- Menu labelling should be considered in conjunction with wider initiatives, working with caterers (e.g. reformulation, portion sizes, pricing strategies, health promotion and education) to make it easier for consumers to make healthier choices out-of-home, which should also be monitored and evaluated.

Findings and recommendations for policies changing the market environment

Measures in this category are diverse but have in common that they change the choice-set facing consumers either by enhancing the availability of healthy foods (usually fruit and vegetables), restricting the availability of unhealthy foods or nutrients (for example banning artificial trans fats, reducing salt in processed foods), or changing relative prices of food through taxes and subsidies. In this category we also include measures to improve the diets of disadvantaged consumers through subsidised vouchers or the social welfare system. Measures that change the market environment have the potential to bring about substantial changes in diets, off-setting the social costs of unhealthy eating. They are also found to be cost effective. However the measures are more intrusive than information interventions and therefore generally less well accepted by the public.

Fiscal measures for the population at large

- Member States should work towards introducing taxes aimed at promoting healthier eating and raising revenue for other healthy eating programmes. The precise form of the tax may vary across Member State and should be informed by careful evaluation of the impacts of the recently introduced taxes in Denmark, Finland, France and Hungary and an assessment of additional alternatives such as nutrient profiling.
- The revenue from any tax should be ring-fenced for use in other cost-effective healthy eating policies.

Fiscal measures targeting disadvantaged consumers

- EU member states should recognise the cost effectiveness of food assistance programmes like the US WIC (Women, Infants and Children scheme) targeted at pregnant women and those with young children and should examine ways they can be made to fit within their existing welfare systems.
- They should further examine whether a US SNAP-like scheme (Supplementary Nutritional Assistance Program) targeted at disadvantaged adults, using vouchers restricted to 'healthy' food groups, could be incorporated into welfare schemes, replacing a component of present cash transfers with a view to improving diets of the disadvantaged.

Availability measures for disadvantaged consumers

- Evidence on the existence and importance of food deserts in Europe where consumers are unable to access healthy food is inconclusive, though emerging research in the US suggests it may be an issue. We recommend more research into the existence of food deserts in European countries and the multi-faceted factors that influence outlet location and consumer demand in these areas.
- More trials should be established to improve access to healthy foods in areas where geographical access is considered problematic. These should incorporate well-conducted evaluations to provide the evidence base necessary for concrete recommendations in this area.

Reformulation

- Voluntary reformulation has been effective in reducing salt intake. All Member States should enter into negotiations with the food manufacturing, catering and retail industries to develop voluntary agreements for salt reduction and these agreements should be extended, as feasible, to include saturated fat and sugar and possibly portion size and positive nutrients such as whole grains.
- Most foods already meet artificial trans fats targets, but EU legislation should be introduced to set a maximum level in all foods.
- Further investigation is needed as to whether a logo for use by participating firms or trade associations in voluntary agreements improves participation rates and the share of produce reformulated.

Regulation of school food provision

- Measures regulating food provision in schools (e.g. the nutritional content of school meals, provision of free fruit and vegetables) are cost effective and recommended, but they should be accompanied by education measures to enhance their long-term effectiveness.
- Regulation of snack food supplies from vending machines in schools is recommended, but machines should supply healthier food choices rather than imposing an absolute ban on vending machines.

Regulation of workplace food provision

- There is suggestive evidence of success and acceptance of workplace measures which expand rather than restrict choice. These can be recommended and further explored in public sector work places in the first instance, perhaps later extending to the private sector. Convincing evidence on the cost-effectiveness of these interventions should be gathered.

Conclusions

We have studied evaluations of nutrition policy interventions carried out by Member States and in the academic literature and have performed further evaluations within the EATWELL project. According to criteria we establish for sound policy evaluation, very few evaluations meet the grade. Despite only partial evidence, the case for action is urgent and there is sufficient evidence for the proposals we make. However, after reviewing the evidence for each individual policy type in this document, the most common recommendation we make is for more and better evidence to be collected.

CHAPTER 1

FULL REPORT

1. BACKGROUND

Unhealthy diets lead to a range of serious conditions such as diabetes, cancers, cardio-vascular disease and stroke which, as well as individual pain and suffering and shortened life, create a burden for the state in the form of health care costs and lost economic production; diseases linked to overweight and obesity account for between 5% and 7% of total health care costs in Europe, more than €60b pa, and at least as much again in lost economic production. In this context it is no surprise that healthy eating has become a major public health concern, prompting many European Member States to take measures to improve their citizens' diets. But how effective are their interventions? How strong is the evidence-base for making evidence-based policy decisions? In which cases is the evidence strong enough to warrant recommendation that measures be put in place at Member State or EU level?

These are the issues addressed by the EATWELL project and are the subject of this Report. The project's main objective is to improve nutrition policy making in Europe by providing scientific evidence of the effectiveness of past interventions. The various components of the work and their organisation may be viewed on the project web-page www.eatwellproject.eu

CHAPTER 2



2. EATWELL METHODS

This report is a culmination of 3.5 years' work begun in April 2009. Various documents ('Deliverables') have reported the component results and a number of scientific publications have been written from these (listed at the end of this Report).

2.1. Policy effectiveness

We began by identifying Member State nutrition policy interventions and whether they had been evaluated for effectiveness and cost effectiveness (see below). Our definition of policy refers only to measures taken at the 'macro' level by national (or transnational) governments or by major regions within nations; we therefore exclude the multitude of community-level measures taken within doctors' surgeries and community organisations. We developed a classification for the interventions, discussed below. In cases where the number of EU interventions was small we looked beyond the EU for further evidence of application and evaluation. We also reviewed evidence of policy effectiveness and cost-effectiveness from the international peer-reviewed literature and from Reports by Governments and NGOs. The findings were reported as Deliverable D1.1 and as peer-reviewed articles (Brambila-Macias et al, 2011; Capacci et al, 2012; and Perez-Cueto et al, 2012).

In assessing the quality of the evidence on specific intervention types, we established a set of criteria:

- the evaluation should focus on meaningful target variables—ideally health outcomes such as blood pressure or CVD, otherwise BMI or food consumption. Too often evaluations don't look beyond knowledge or attitudes;
- the evaluation methodology should be based on sound statistical analysis and appropriate data. Such matters can be rather technical, but include adequate sample size, random sampling (avoidance of 'selection bias'), proper accounting for confounding factors (other variables which might influence the outcome of interest and should be controlled for during the analysis), careful specification of the 'counterfactual', and so forth (see Deliverables D5.2 and D5.3);
- the evaluation should be able to assess the impact of an intervention on relevant segments of the population, not just measure an average effect. In particular, impacts on 'at risk' or deprived households should be identified;
- the analysis should identify long term as well as short term effects;
- the evaluation should include a careful cost-effectiveness analysis, separating private and social costs and benefits and assessing the cost per QALY gained from an intervention (see discussion below).

None of the evaluations we identified fully met this gold standard. Indeed, the most common evaluations used by policy makers simply compare the average value of the variable of interest before and after the intervention, while failing to recognise the multitude of factors that might also have impacted on the target variable. For example, an increase in the consumption of fruit and vegetables following a 5-a-day campaign might not be due to the social marketing campaign, but to a fall in market prices. In part to improve the evidence-base and in part to demonstrate improved methods, a group of existing

interventions was selected for further impact assessment. These case studies were selected because their existing evaluations could have been easily improved employing econometric techniques and more rigorous evaluation strategies and suitable data were available to enable further analysis and evaluation; or they are widely adopted or gaining growing attention among policy makers.

Six interventions were chosen:

1. Advertising regulation in the UK: a package of rules aimed at reducing the impact of television advertising of high fat, salt and sugar (HFSS) food and drink to children introduced on 1 April 2007. An official evaluation of this intervention assesses the changes in children's exposure to the advertising messages. Our further evaluation adopted actual food consumption as the outcome variable.
2. Public information campaign & government action to encourage reformulation to reduce the population average salt intake in the UK: the Food Standards Agency salt campaign launched in September 2004. An official evaluation by the Food Standards Agency simply compares pre-post levels of average sodium intake. Our evaluation makes use of econometric modelling to estimate the impact net of all the observable confounding factors.
3. Public information campaign promoting fruit and vegetable consumption in UK: the UK 5-a-day program. Econometric modelling disentangles the pure policy effect from changes induced by market forces (prices).
4. Public information campaign promoting fruit and vegetable consumption in Denmark, Spain and the UK. This case study uses panel data (repeated cross-sections) to capture trends and dynamics in fruit and vegetables consumption in order to correctly isolate the policy effect.
5. Regulation of catered meals in schools in France: the ban of vending machines in French secondary schools introduced by the 2004 Public Health Law from 1st September 2005. The ban involves vending machines selling any kind of food and drink. No evaluation of the ban exists. We used existing secondary data on food consumption to estimate the impact of the ban on children's nutrition.
6. Reformulation in the UK, Denmark, Poland, Italy and through industry voluntary commitments in the EU Platform for Action on Diet, Physical Activity and Health. The effect of reformulation was investigated employing a qualitative approach which is ideally suited to complex situations with many factors interacting and insufficient data for quantitative analysis

The results of these analyses have been reported as project Deliverable D2.2. Published peer-reviewed articles are Capacci and Mazzocchi (2011) and Shankar et al (2012) with others in preparation or under review.

2.2. Cost effectiveness

Policies should not only be effective but also cost effective. Economists and public health professionals have developed a number of approaches to valuing intangible policy outcomes such as human life and disability. Economists generally consider cost-benefit analysis to be the gold standard in measuring the impact of a policy intervention, but it is demanding in terms of its information requirements, so simpler methods are sometimes appropriate (see project Deliverable D2.3).

On the benefit side of the equation it is useful to distinguish between *private benefits* which accrue directly to the individual consuming the food (e.g. reduced risk of cancer and its effects), and *public benefits* which are public sector savings from reduced visits to doctors and hospitals, reduced medication and reduced costs associated with missed days of work. These are often intermingled by government departments and public health professionals.

The Quality Adjusted Life Year, QALY, is the most commonly used measure of benefit by the public health profession¹. It is an attempt to measure in a single figure the benefits of an intervention that

1. An approximately equivalent (but inverse) measure is the Disability Adjusted Life Year (DALY)

increases both life expectancy and the quality of life. QALYs assign to each year of ill-health a utility value that is a fraction of the value of a year of good health. (see e.g. Szende, Oppe, & Devlin, 2007).

What QALYs measure are the private benefits of a policy that improves people's well-being by making them live longer and in better health. In other words, they reflect how much people value their own improved health. QALYs do not measure the public benefits, those that result from a reduced burden on health care systems and economic production. These are sometimes called a reduction in the cost of illness. Conceptually, the savings resulting from a reduced cost of illness should always be included in an assessment of the benefits of a public policy intervention. Conversely private benefits, measured by QALYs, should only sometimes be included—and we would argue that the determinant of whether QALY benefits should or should not be included is whether people knowingly choose the unhealthy option (exercising informed choice) or they inadvertently choose the unhealthy option because they are not informed or lacked the education to assess the information (Traill, 2012). Like mountaineering or any other risky activity freely entered into, it is not logically correct to say that banning it would increase people's utility. The public health profession generally does not generally make the distinction between whether unhealthy choices are purposely or inadvertently taken and includes the utility value of all health gains as a benefit.

The cost side of the equation includes public and private sector costs associated with a policy measure.

Both costs and benefits are usually discounted to reflect the fact that people value the near future more highly than the distant future. This means a policy to reduce, say, food poisoning incidence with immediate effect would be valued more highly than an intervention that reduced the likelihood of cancer and saved the same number of lives and years of ill health, but in the sort of time-frame applicable to diet and health interventions. A discount rate of around 3% p.a. is typical for government projects, implying €1 in one year's time is worth only 97 cents today and €1 in 20 years time is worth only $1/(1.03)^{20} = 55$ cents now.

It is common when using QALYs (or DALYs) to calculate the cost per QALY gained from an intervention. This is known as *cost-utility analysis* (CUA), though in this report we use the term cost-effectiveness interchangeably with cost-utility. An implicit value placed by government on the QALY is given by the cut-off point whereby interventions (or new medicines) are approved for use in the health service. For example the National Institute for Health and Clinical Excellence (NICE) in the UK uses a figure of about €35,000.

EATWELL has not carried out new assessments of cost effectiveness, rather, for this report we draw primarily on two recent comprehensive studies, by the OECD (Cecchini et al 2010 and Sassi et al 2009) and by the Australian National Health and Medical Research Council (Vos et al, 2010). We use other information from the published literature when it is available.

2.3. Public opinion

Policy makers must consider public opinion when devising nutrition policy actions; the most well-intentioned and well-crafted policy may founder in the absence of public support. A seminal study on the subject was carried out by Oliver and Lee (2005) in the US but since policy preferences vary across culture and over time, and Europeans are relatively new to the debate, we conducted a survey, based on a representative sample of over 3,000 respondents in five European countries, to measure public support and willingness to pay (through the tax system) for different policy measures. This is the first multi-country European survey of policy preferences and covers the full range of potential drivers of opinion explored in the literature. Results are reported in project Deliverable D4.2 with a number of additional scientific publications under review and in preparation.

2.4. Stakeholder opinion

As well as public opinion, experts in the food industries, food policy makers and representatives of consumers and certain other NGOs have important insights into whether policies are acceptable, would work or have unintended consequences. We consulted these three stakeholder groups, asking them to comment on our preliminary findings, in workshops held in Italy, Poland, Denmark and Brussels. Reaction from stakeholders was gathered by presenting them some *Points for Discussion* broadly based on the collected evidence, but worded in a way to stimulate the debate. In this document, we report these points for discussion and summarise the stakeholder feedback, while the full report on stakeholder feedback is available on the EATWELL web-site (www.eatwellproject.eu).

2.5. Bringing it together

Using our classification, for each policy we present first the evidence on effectiveness followed by evidence on cost effectiveness and our evaluation of the strength of the evidence. Much of the material which is reported in D1.1 and D2.2 was collected and written up 2-3 years ago, so short sections update the findings. For each policy this is followed by the evidence from the survey on public acceptance. The points for discussion at the stakeholder workshops follow, as mentioned above, sometimes in a provocative format to encourage discussion, then stakeholder feedback from the workshops is summarised. EATWELL comment on stakeholder feedback and other new evidence follows, then finally we present recommendations for policy implementation or further research. The findings, their analysis and recommendations have been discussed by EATWELL partners together with the project's Stakeholder Advisory Board at a meeting in November 2011 (preceding stakeholder workshops) and by partners alone in May 2012 (following the workshops), and through regular electronic communication.

CHAPTER 3



3. WORDS OF CAUTION

By definition the effectiveness of policy intervention in a new area cannot be evidence-based, it can at best draw on evidence from similar measures taken to alleviate related problems. It takes time for a coherent evidence base to build up. Most of the interventions to improve diets are recent and fall in this category, so the evidence base often turns out to be quite weak. This makes it especially important that sound evaluation is incorporated as an essential part of any new intervention (which it often has not been). In the meantime, policy makers still need to make decisions, so the partial evidence we provide in this report is still useful. As indicated above, we have indicated the strength of the evidence whenever possible.

In providing evidence on policy effectiveness and cost effectiveness it has been necessary to be reductionist and present the evidence for each policy in turn. It is probable that there are synergies between policies, for example education and information measures linked to actions to promote product reformulation. It has not been possible to assess whether combinations of policies would work better than the sum of their parts (there is no evidence-base), but stakeholders consider this to be important.

4. POLICY INTERVENTION: DEFINITION AND CLASSIFICATION

We have classified policy interventions into two broad categories: (a) measures supporting informed choice; (b) measures changing the market environment. Informed choice is the basis for consumer sovereignty which is integral to economic models of utility maximisation and to the neo-liberal politics common to the EU Member States. Measures included in this category are nutritional education programs, nutrition labelling, social marketing (information from the State) and restrictions on commercial advertising². Measures to change the market environment are more interventionist and have been less widely used by governments, at least with respect to adults. They include food standards to regulate nutrient content of foods, taxes and subsidies on unhealthy foods or nutrients, regulation of the foods available in school or workplace canteens and measures to make healthy foods more readily available to low income households.

While information is necessary for informed choice, it does not ensure healthy eating; but informed but unhealthy choices continue to impose costs on health care systems and economic productivity (commonly called social costs) that are borne by the whole of society. Measures to change the market environment may be thought of as intending to push people towards what is good for society as a whole rather than for the individual (known within the jargon of economics as eliminating externalities).

Table 1 shows our classification of the full list of policy interventions and the number of specific measures implemented by Member States identified by EATWELL (almost certainly, despite our best efforts there will be omissions

Table 1: Number and Type of Diet and Health Measures in the EU identified by EATWELL

Measures supporting informed choice	82
Advertising controls	5
<i>On advertising to children</i>	4
<i>On general advertising</i>	1
Public information campaigns	38
Nutrition education	35
<i>For children at school</i>	31
<i>For adults / generic public (e.g. at workplace)</i>	4
Nutrition labelling	4
Nutritional information on menus in restaurants	0
Measures changing the market environment	39
Fiscal Measures	3
<i>Tax/subsidies on foods to the population at large</i>	1
<i>Measures aimed at disadvantaged consumers</i>	2
Regulate meals	14
<i>School meals (including vending machine bans and provision of free fruit and vegetables)</i>	13
<i>Workplace canteen meals</i>	1
Nutrition-related standards	1
Government action to encourage private sector action	9
Availability measures for disadvantaged consumers	2
TOTAL	121

2. These may be considered as controls on misleading information.

CHAPTER 5



5. EVALUATION OF POLICY MEASURES SUPPORTING INFORMED CHOICE

As indicated above, the rationale behind these types of interventions is that the more information consumers have, the better the decisions they will make. There are two issues: the first is education, intended to boost the ability to understand what foods and nutrients should be consumed in what quantities; the second is information on the constituent foods and nutrients present, particularly in processed foods and prepared meals.

Of course more information and education do not guarantee that the consumer chooses a healthier diet. Many people prefer unhealthy foods and are not too concerned about the risk of adverse health consequences decades into the future. Nevertheless, supporters of these types of interventions believe that most people are not fully aware of the negative health effects associated with a poor diet, and believe that increasing awareness through social marketing campaigns, providing clear labelling on food products and better education will lead to a healthier society.

It is important to re-iterate that the interventions under analysis are relatively recent which precludes assessment of long-term effects. We know that social norms influence individual behaviour and can draw on non-food examples to demonstrate how attitudes towards smoking, drink-driving, wearing seat belts and crash-helmets have changed dramatically over an extended period of time and this has changed behaviour and the willingness to accept policy interventions which restrict individual freedom. These successes have been attributed to long-term campaigns continually reinforcing the message of what constitutes good behaviour. In most cases, information has been accompanied by measures to restrict individual freedom, for example, making drink-driving and not wearing seat belts illegal. While pointing to these successes though, it is also possible to identify failures to change social norms, for example with respect to binge-drinking or marijuana consumption by the young. One may hypothesise on the reasons for success or failure, but the fact is very little is known, theoretically or empirically, about how social norms change in the long term. We therefore warn the reader that whilst our analysis may (or may not) suggest a change in consumption of some food or nutrient in response to, say, a social marketing campaign, we are unable to assess the cumulative, long term impacts.

5.1. Advertising controls

EATWELL has undertaken an empirical case study (reported in Deliverable 2.2) on the effectiveness of an advertising control policy on children's food consumption in the UK. In what follows, we draw upon that case study as well as a review of the literature and government reports.

Background

Television viewing, by promoting sedentary lifestyles, encouraging snacking and exposing viewers to food promotion, is considered a key correlate of poor diets and research has found this relationship to hold consistently across countries and cultural settings. Foods, particularly unhealthy foods, are heavily promoted on television - for example, in the UK, 75% of food promotion through mass media

is via television, and foods high in fat, salt and sugar were among the most heavily advertised foods on television prior to recent regulation. Given that trends in obesity and poor dietary habits among children are particularly alarming, that dietary habits formed in childhood persist into adulthood, and since children are thought to be particularly susceptible to advertising, attention in this area has predominantly focussed on advertising of unhealthy foods to children.

General regulations on advertising to children are common in Europe, (eg. total bans on advertising to under-12s in Sweden and Norway) and special restrictions on food advertising to children also exist in many member states, for example in the UK, France and Ireland. Food advertising restrictions generally relate to the timing and content of advertising. In France, television advertisements for processed food products and beverages containing added sugar, salt or artificial sweeteners have to be accompanied by public health messages. In the UK, a regulatory system prevails whereby foods are classified as high in fat, salt or sugar (HFSS) or not, and this classification determines whether the product is allowed to be advertised during children's programmes and on children's channels. In Ireland, the use of celebrities and cartoon characters in promotion of food to children is not allowed, advertisements for certain categories of foods, for example, fast foods, have to be accompanied by messages stating the importance of balanced diets and the need for moderation, and promotion of confectionery has to be accompanied by messages warning of potential impacts on dental health.

Additionally, major food and beverage companies have also entered into voluntary agreements that limit advertising targeted at under-12s to foods meeting high nutritional standards. These include the EU Pledge (www.eu-pledge.eu), and the Canadian and the US Children's Food and Beverage Advertising Initiatives (CFBAI).

Evaluation of evidence on policy effectiveness

A valid initial question to ask in this context is: how strong is the association between (unhealthy) food promotion and food preferences and food-related behaviour of children? Evidence consistently indicates that food promotion does have a direct impact on food-related preferences/attitudes/behaviour of children (Deliverable 1.1), but it is important to note that: (i) food promotion only explains a small part of the total variance in children's food-related preferences/attitudes/behaviour (Livingstone, 2004), and (ii) although many studies establish a statistically significant effect of food promotion on behaviour, the size of effect is small (Livingstone, 2004). This suggests that policies regulating advertisement of unhealthy foods to children may be expected to have some role in promoting healthier diets, but they cannot be expected to produce large effects on their own. However, note that the research described above only includes direct effects of promotion on outcomes. There may also be important indirect effects, eg. peer network effects, wherein advertisements influence peer expectations regarding desirable consumption, which may then translate into an indirect effect on individual child consumers. In contrast to the suggestions of Livingstone (2004), one study (Chou *et al.* 2008) links fast food advertising strongly to the weight of children in the US in a multivariate model. Simulating the effect of a ban based on the estimated model, Chou *et al.* suggest an 18% reduction in the number of overweight US children aged 3-11 in the absence of fast food advertising.

Some articles in the very limited set of studies directly investigating the impact of advertising regulation on dietary outcomes among children do find statistically significant but relatively small effects of policy introduction. In Canada the ban on advertising to children imposed by the province of Quebec in 1980 was found to reduce fast food consumption by \$ 88 million per year in 2010 (Dhar and Baylis, 2011). In terms of the number of fast food meals, the ban might effectively reduce the number of fast food meals being sold in Quebec by between 7.1 and 16.8 million per year, though after a series of extrapolations the authors note that this would amount to about a 0.6 kg reduction in weight amongst treatment group members. A study examining the introduction of advertising controls in France reported that 21% of their sample altered their eating habits as a result of the regulation. However, this is self-reported consumption, and could be an overestimate. In the UK, OFCOM found that its regulation on advertising of food resulted in a 37% reduction in advertisements for unhealthy foods seen by children. However, in EATWELL's own case study (described in Deliverable D2.2) of the effect of the OFCOM regulation on consumption, we concluded that we could find no statistically significant policy effect on household expenditure on a set of unhealthy foods once we adopted a flexible and general specification for our regression model.

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

The OECD study (Sassi *et al* 2010) found control of food advertising to children to be cost-effective. However, it is worth bearing in mind that this was based on policy effectiveness estimates from a single study by Chou *et al.* (2008) in the US which simulated the effect of a ban rather than directly studying the effect of a policy change.

FSA undertook an *ex-ante* cost-benefit analysis of the OFCOM advertising regulation *assuming* the substitution of healthier alternatives for HFSS food as a result of the regulation. As discussed in EATWELL Deliverable 2.3, this study found costs to outweigh benefits. But this ratio was not nearly as attractive as that applicable to the salt campaign, for example, and there is much uncertainty surrounding the estimate.

As noted, our own study for OFCOM case in the UK failed to uncover a statistically significant effect, and thus the cost-effectiveness question in this case is a moot one.

Additional comments (including new literature)

Results from a study looking at exposure of children to HFSS advertising in the UK before and after the OFCOM regulation have recently become available. Adams, *et al.* (2012) analysed the content and viewership of advertisements broadcast 6 months before and after the OFCOM ban in one region of the UK, linking the advertised foods to nutritional content. Their findings show that, although the OFCOM regulations were generally adhered to, the regulation did not reduce children's exposure to HFSS advertising. In fact, their results suggest an *increase* in HFSS advertising exposure after the ban. This casts doubt on the OFCOM (2010) assessment suggesting a 37% reduction in exposure, and is consistent with EATWELL's own study of the effects of the regulation on HFSS expenditures.

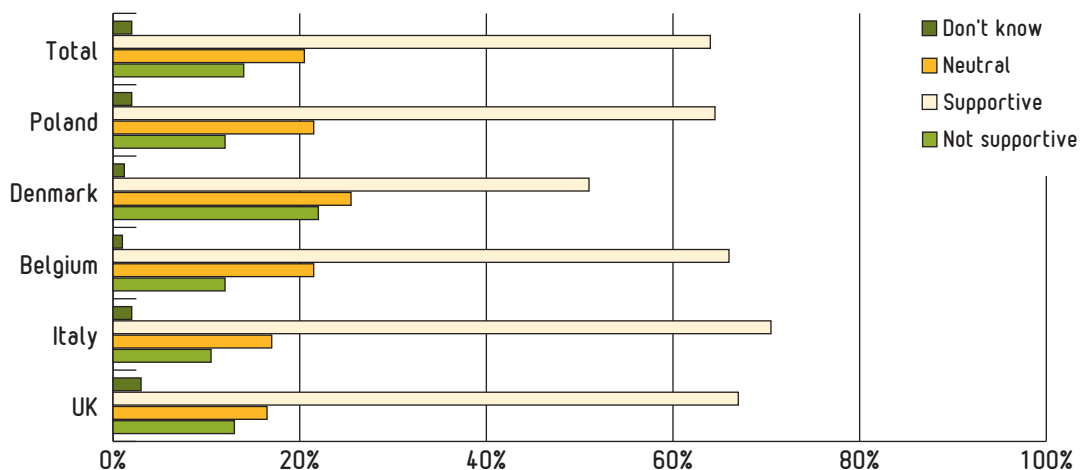
Adams *et al.* suggest that advertisers have likely responded to the regulation by simply moving the timing and channel outlets for HFSS advertising. They conclude that '*Our finding that exposure of children to HFSS food advertising, as a proportion of all advertising seen, did not change despite good adherence to the restrictions reflects the fact that children watch a wider range of television than just those programmes particularly targeted at them. By focusing on only a subset of all advertisements that children are exposed to, the UK scheduling restrictions appear to have been flawed from the outset. Future policies should consider including a much wider range of advertising - for instance, by using a time-based 'watershed', as proposed by recent guidance from the UK National Institute for Health and Clinical Excellence*' (Adams, *et al.* 2012).

Additional relevant evidence has also become available recently from a study of the US Children's Food and Beverage Advertising Initiative (CFBAI) (Huang and Yang, 2012). CFBAI is a self-regulatory programme in the US, and the Huang and Yang study looks at the effects on children's advertising exposure and household confectionery consumption of CFBAI pledges made by Hershey's, Mars and Cadbury Adams over 2006-08. Their results show that the pledge did not appear to make any difference to Hershey's and Mars advertising, since most of their advertising was directed at adult programming and channels to start with. Household consumption of the relevant Hershey's and Mars products was correspondingly unaffected. More heartening are their findings that in the case of Cadbury Adams, the firm eliminated its advertising for the relevant product across *all* channels, and that this reduced household consumption significantly. In their conclusions, Huang and Yang note that '*...our findings highlight insufficiency of reducing children's advertising exposure through restricting advertising only on children-oriented TV programs*'. In other words, their findings are consistent with the limited efficacy of the OFCOM approach as found in the Adams and EATWELL studies. Their findings with respect to Cadbury Adams offer hope that, where advertising exposure can indeed be sufficiently restricted, consumption effects may follow. More validation of this aspect through additional studies would be helpful.

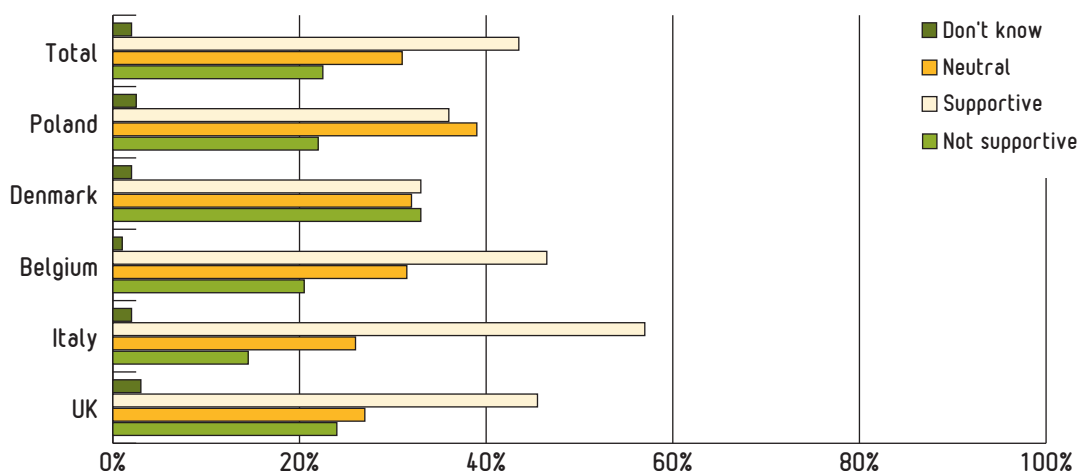
Public acceptance

Response in the survey to the statement “The government should ban advertising for junk food and fast food that is aimed at children” indicates relatively high levels of acceptance (63.9% of respondents in the EATWELL survey agree or strongly agree on this item). However, response to an equivalent survey statement for adults is one of the most opposed, only about 44% of respondents are in favour of advertising bans to adults. Of the 5 countries surveyed, Italy is most supportive of restrictions to both adults and children, Denmark least supportive.

› The government should ban advertising for junk food and fast food that is aimed at children



› The government should ban advertising for junk food and fast food that is aimed at adults



Points put to stakeholders for discussion

Research on the effect of unhealthy food promotion on children’s food choices finds that there are modest effects, and research on the effects of advertising regulation on children’s food choices also finds modest effects (with one exception). This makes it difficult to say anything meaningful about cost effectiveness. The potential impact of television advertising regulation is also increasingly likely to be diluted by the globalisation of television programming, as has been argued in the case of the Swedish ban.

- The available evidence on the effects of advertising regulation on children’s diets suggests only small effects, and advertising regulation for children is likely to be less cost-effective than some other healthy-eating interventions due to benefits accruing only in the relatively distant future. Due to these reasons, food advertising regulations for children are not recommended.
- Regulation of food advertising to adults has very low support amongst the European population, and adults in any case may be less susceptible to promotion than children. Thus regulation of advertising to adults is not recommended.

Stakeholder feedback

Restricting advertising to children:

There was substantial disagreement amongst all types of stakeholders with the suggestion that restricting advertising to children is not warranted. The following points were made in opposition to this suggestion: that long-term impact studies are absent in the literature; that broader regulation cutting across media are likely to show impact even where partial restrictions have been unsuccessful; that cost-effectiveness calculations in this case are shrouded in uncertainty; that advertising restrictions considered in synergy with other policies, eg. nutrition education, may be successful.

Most groups felt that, at the minimum, industry self-regulation programmes are needed.

There was disagreement amongst some stakeholder groups, particularly consumer groups, with the suggestion that restricting advertising to adults is not warranted. Points made in opposition to this suggestion included: that there is insufficient evidence about susceptibility of adult consumers; that consumer opinion is not a sufficient basis for such a recommendation.

EATWELL response to stakeholder comments and new information

Our initial recommendation, that introducing further advertising regulation on children's advertising is not recommended, was based on the premise that the burden of proof requires an evidence base showing that the regulation is likely to work. The evidence base currently does not show this. Thus we are unable to agree with arguments from some consumer and policy groups in the stakeholder discussion that bypass this evidence base.

However, we do accept two key nuances: (i) there is a chicken and egg problem. Introducing regulation ideally needs an evidence base regarding potential policy efficacy. However, policy efficacy is difficult to judge until regulation is introduced! (ii) Related to (i), the one children's advertising regulation in Europe on which evidence is starting to become available, the OFCOM case in the UK, is limited in its coverage. As discussed above, the Adams *et al.* (2012) and Huang and Yang (2012) studies have both concluded that restrictions confined to children's channels or programmes appear ineffectual in reducing exposure. An argument could be made that more stringent regulations cutting across channels and time-periods may have stronger effects, as in the Cadbury Adams case reported in Huang and Yang. However, more research is needed on this.

We also accept that examining evidence over the long-run is important, eg. in the OFCOM case.

With regard to children's advertising: We still believe that there is no compelling case to be made for introducing further regulation with limited coverage, ie. restricted to children's channels or airtime as in the OFCOM case. More research is required on whether stronger restrictions applying across channels and time periods do produce stronger consumption effects, and we strongly recommend efforts to improve this evidence base. There are only two options for gathering such evidence³, both of which have unsatisfactory aspects to them: one is to wait for more evidence to accumulate from across the world, eg. as in the Cadbury Adams case (even if that was a self-regulation case). The other is to press ahead with such regulation in limited geographical areas and learn from the resulting 'natural experiments'. Both options imply a substantial lag before the required evidence base is in place.

Some consumer and policy groups in the stakeholder sessions have expressed the desirability of restricting advertising to adults as well, although there is relatively little public support for this. However, in our view this in itself is a lower priority policymaking issue than restricting advertising to children. Also, the evidence base on this is even thinner than in the case of restricting children's advertising. However, the suggestion that stringent restrictions aimed at limiting child exposure are worth trialling and studying, of course implies that in these cases advertising of unhealthy foods to both children as well as to adults will be restricted.

3. Assuming evidence beyond experimental results is desired.

Final recommendations on advertising controls

- Partially restricting advertising of unhealthy foods through children's TV programmes (i.e. restrictions only covering certain channels or programmes) has had only a small effect on diets. A broader approach encompassing all TV channels as well as other media may be more effective. We recommend investment in building the evidence base on this, via further experimental studies, or where the opportunity presents itself, by introducing legislation and planning rigorous impact evaluation around it.
- Regulation of food advertising to adults has very low support amongst the European population, and adults in any case are less susceptible to promotion than children. Thus regulation of advertising to adults is not recommended.

5.2. Public information campaigns

EATWELL has undertaken empirical analyses on the effectiveness of fruit and vegetable public information campaigns in the UK, Denmark and Spain (described in Capacci and Mazzocchi, 2011 and in EATWELL Deliverable 2.2). The UK salt campaign analysed in Shankar *et al.* 2012 and Deliverable 2.2 also included a public information element. In what follows, we draw upon those studies as well as review of the literature and government reports.

Background

Public information campaigns exploit media communication and other social marketing tools to improve individual and social knowledge about health issues connected to food habits, and may be directed at any kind of target population. It is by far the most common healthy eating policy type, along with child-education interventions. One possible reason for the popularity of information campaigns and nutrition education within the dietary policy portfolio may be that they do not impose direct restrictions or direct costs upon industry, and may also be seen as being less intrusive by consumers. Almost a third (38 out of 121) of the healthy eating policies in Europe identified by us belonged to this category. There is large variation in the types of campaigns included within this policy umbrella: information campaigns promoting overall dietary and lifestyle changes to address rising obesity rates are common across Europe. These are often embedded within larger obesity prevention programmes, such as the 'Platform against Obesity' in Portugal. An increasing number of campaigns are targeted at specific foods or food groups, such as the salt campaigns in UK and Italy, and the Polish and Danish fish campaigns. Campaigns promoting positive messages have been at the heart of the various '5-a-day' (or '6-a-day' in Denmark) campaigns promoting the consumption of fruit and vegetables (F&V).

Evaluation of evidence on policy effectiveness

Most public information campaigns have been evaluated exclusively in terms of impact on awareness and knowledge and in terms of changes in claimed behaviour (see Table 1 below). Official evaluations normally 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. With regard to actual behavioural changes, a comprehensive literature exists on the efficacy of public F&V promotion in Europe, the US and Australia, which shows small increases in consumption of between 0.2 and 0.8 portions (Capacci *et al.*, 2012, Deliverable 2.1).

One complication with respect to population-level evaluation using intake/consumption data is that public information campaigns often come bundled with measures promoting availability, eg. school fruit schemes in many 'five-a-day' or similar campaigns, or other policy measures. An EATWELL case study (Shankar, *et al.* 2012) found the UK salt campaign to have successfully reduced population salt consumption by 10%, but the nature of the data did not allow the disentangling of the effects of the public information segment of the campaign from the food reformulation segment.

Economy-wide increases in demand for specific food categories created by social marketing have the potential to push prices up in the short-run, thus diluting the potential positive effects of the policy. However, social marketing, by making consumers aware of the importance of maintaining consumption, may also make consumers less price responsive. Our own WP2 case study of the UK five-a-day programme that accounts for these market and behavioural responses estimates an average increase in intake of 0.3 portions as a result of policy introduction (Capacci and Mazzocchi, 2011).

A problem however is that sustaining policy impacts over the longer term is likely in many cases to require sustained investments. Short-lived social marketing campaigns may be doomed to fail due to the nature of the environment in which individuals nowadays live, where a series of factors continuously encourage unhealthy behaviour. For example, evaluation of an F&V information campaign in Western Australia showed a significant increase in consumption during the campaign, but a falling off immediately after (Pollard, *et al.* 2008). Substantially more research is needed on the causal links between campaigns and long-term behaviours and consumption.

Evidence on cost-effectiveness (from EATWELL Deliverable D2.3)

Even though publicity campaigns tend to produce only modest impacts on health outcomes, they can often do so for comparatively small outlays. This makes them generally cost-effective. The public information intervention modeled in the OECD (Sassi *et al.* (2009) study was found to be cost-effective. The UK salt and five-a-day campaigns studied in WP2 were also found to be cost-effective in WP2's Deliverable 2.3 (although, as noted before, in these cases the policies also involved other policy elements in addition to publicity campaigns).

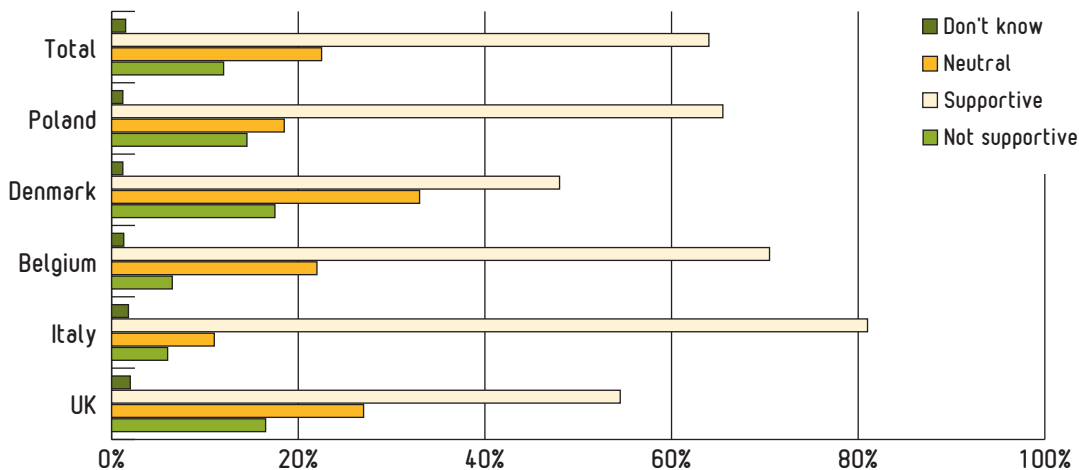
Additional comments (including new literature)

The cost-effectiveness claim of public information campaign, noted above, is bolstered by new evidence from France that information campaigns are cost-effective, and more so than VAT reductions or provision to disadvantages consumers via stamps, in the case of fruit and vegetables (Dal-longeville, 2011)

Public acceptance

63.7% of those surveyed were in favour of the proposition “*The government should spend money for information campaigns informing people about the risks of unhealthy eating*”. The Danes were most accepting of using public funds to support social marketing, the Poles least.

- › The government should spend money for information campaigns informing people about the risks of unhealthy eating



Points put to stakeholders for discussion

Implementation of public information campaigns may be easier for policymakers than many of the alternatives in our healthy eating policy set, because (i) there is already substantial experience to draw upon and (ii) at least in the case of campaigns involving positive messaging, they may encounter relatively little resistance. Hence it is likely that such campaigns will continue to be part of most healthy-eating policy portfolios. Where effects of behaviour and consumption have been tracked, they have shown modest positive effects on diets. Even though effects are small, evidence suggests they are cost-effective.

- We recommend further use of public information campaigns, with the proviso that investment be sustained in order to sustain effects on behaviour.
- These sustained campaigns could benefit from incorporating key success factors of commercial (marketing) identified in the EATWELL project and best practice social marketing. The success factors are amongst others greater awareness of trends that campaigns could react to, appealing to citizens emotionally by e.g. stressing the ‘simplicity’ and ‘naturalness’ of healthy food, engaging and involving consumers based on common values and in communities of different kinds, using media targeted and strategically and specifying short-term gains of healthy eating alongside with better health (Aschemann-Witzel et al. 2012).
- Too many current campaigns are short-lived and thus of limited use. This multitude of short-term campaigns should be rationalised to fund a smaller number of campaigns with larger and longer-term investments.
- Public information campaigns may work best when implemented in synergy with other measures, such as increasing availability, labelling or reformulation. This is already the practice in many programmes and deserves to be continued. The practice of aligning the impact of different marketing elements (the ‘four Ps’) and the experience with commercial marketing’s trend to a more integrated marketing communication (Pelsmacker et al. 2010) underlines the value of synergy.

Stakeholder feedback

Almost all groups in all countries endorsed the recommendation that information campaigns be continued and long term. It was noted however that this should include targeting to reach certain groups more effectively. The only disagreement came from consumer groups in Belgium, who felt that short campaigns can be successful if supported by other measures.

Recommendations for use of commercial marketing techniques and for exploitation of synergies received wide support.

EATWELL response to stakeholders and new information

Given that there is broad stakeholder support for all our initial recommendations on public information campaigns, our recommendations remain unchanged.

Final recommendations on public information campaigns

- We recommend further use of public information campaigns, with the proviso that investment be long term in order to sustain effects on behaviour.
- These sustained campaigns could benefit from incorporating key success factors of commercial marketing and best practice social marketing as identified in the EATWELL project. The success factors are, amongst others, greater awareness of trends that campaigns could react to, appealing to citizens emotionally by e.g. stressing the ‘simplicity’ and ‘naturalness’ of healthy food, engaging and involving consumers based on common values and in communities of different kinds, using media targeted strategically and specifying short-term gains of healthy eating alongside better health (Aschemann-Witzel et al. 2012).
- Too many current campaigns are short-lived and thus of limited use. This multitude of short-term campaigns should be rationalised to fund a smaller number of campaigns with larger and longer-term investments.

- Public information campaigns may work best when implemented in synergy with other measures, such as increasing availability, labelling or reformulation. This is already the practice in many programmes and deserves to be continued. Commercial marketing's trend to a more integrated marketing communication underlines the value of synergy.

5.3. Nutrition Education

EATWELL has not conducted independent research into the effectiveness of interventions to improve nutrition education. What follows is based on our analysis of the literature and government reports.

Background

Nutritional education's main goal is to improve people's knowledge of what constitutes a healthy diet and inform them of ways to improve their diets and their lifestyles. Most commonly targeted at children in schools, they could also be targeted at adults in the workplace. Social marketing campaigns often include an element of education within them (e.g. providing information on how much salt or fruit and vegetables should be consumed).

Some degree of nutrition education is present in the school curriculum of almost all countries. In Finland, for example, nutrition is taught 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. In England, Wales and Northern Ireland, primary school children are taught about healthy eating in personal, social and health education and in design and technology classes. In Portugal, the education system includes mandatory nutrition education with the aim of teaching students that wellbeing depends on a balanced diet, hygiene and physical activity, as well as on food safety and disease prevention.

Evaluation of evidence on policy effectiveness

As indicated in EATWELL Deliverable D1.1, in our *Nutrition Reviews* article (Capacci et al, 2012) and our *Food and Nutrition Bulletin* article (Brambila-Macias et al, 2011), the variation in geographical scope and intensity makes it difficult to generalise findings on policy effectiveness. A number of small scale interventions and studies have found positive, if small, links between knowledge/education and specific food intakes and the evidence is suggestive of effectiveness, but with uncertainty about scaling up. Evaluations have generally limited themselves to assessing the impact of education on attitudes and knowledge and have been short-term in nature (Capacci et al 2012).

Sassi et al. (2009) found that health education programs, complemented by appropriate catering services within schools, increased fruit and vegetable intake, although dietary changes diminished after exposure to any program ended.

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

The OECD study (Cecchini et al 2010) found school-level education interventions were not cost effective, presumably because of discounting over the typically very long period from poor child-hood diets to adverse health outcomes.

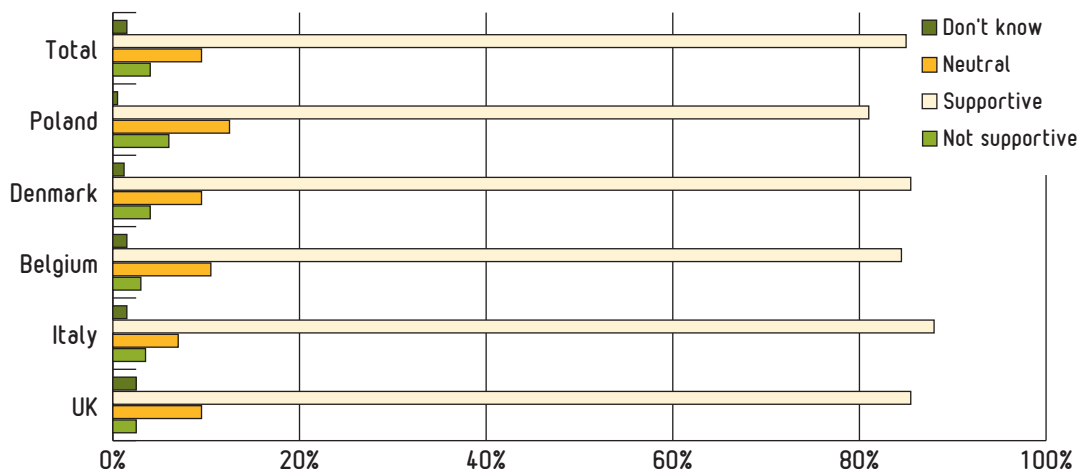
Additional comments (including new literature)

This continues to be a fertile field of research: a google scholar search on 09/07/2012 for 'nutrition education evaluation reviews' found 14,500 articles in 2011 and 2012 alone. These have not been comprehensively analysed but they do not appear to contradict our assessment.

Public acceptance

Education measures in school are by far the most supported among all nutrition policies. Response in the survey to the statement “*education to promote healthy eating should be provided in all schools*”, found favour with 85% of the EATWELL survey respondents (see EATWELL Deliverable D4.2) with a narrow range between 81% (Poland) and 88% (Italy). The survey contained no relevant question on nutrition education of adults.

› Education to promote healthy eating should be provided in all schools



Points put to stakeholders for discussion

Nutritional education is vital for informed choice and it could be argued that providing some level of nutritional education is an ethical obligation of governments. For children (but not adults) the policy has wide public support, though it is not a very cost effective policy measure.

- Although nutrition education should be a compulsory component of school curricula in all EU countries, much higher than present levels of investment in nutrition education would likely not have much impact on diets, is not cost effective, and cannot be recommended.
- Nutrition education of adults in the workplace would be unpopular and ineffective and is not recommended.

Stakeholder feedback

The suggestion that further investment in nutrition education to children was not warranted attracted widespread disagreement from all types of stakeholders in all countries. They argued it is not presently mandatory in all countries, but should be; that the duration and depth of nutrition education was often too limited; that education should be linked to the provision of healthy food in school canteens; that it should be a component of broader education about healthy lifestyles; and the importance and cultural significance of food and cooking should be a component of the educational delivery.

There were more mixed responses to the point concerning adults, though the majority believe there is a role in workplaces for combined measures promoting healthy lifestyles including the provision of nutrition information in the workplace (as opposed to ‘teaching’) and healthy food in cafeterias. Many large firms already do this.

Such measures with children and adults can have knock-on effects which might improve the efficacy of other nutrition policies.

EATWELL response to stakeholders and new information

We were not arguing against nutrition education, but were arguing that there was insufficient evidence that increasing expenditure on nutrition education beyond present levels would be cost effective. We agree with measures to make such education more attractive and the suggestions that, at school and in the workplace, the provision of information coupled with a healthy food environment is desirable. We therefore modify our recommendation with respect to children's education to avoid possible confusion and the impression we do not favour nutrition education. Likewise with respect to adults, we accept the view of stakeholders that nutrition education as part of a healthy work environment might have positive outcomes. However we have insufficient evidence to recommend policy makers should legislate for this and think it is an issue best left to the individual workplace. Governments might wish to take a lead in public sector workplaces.

Final recommendations on nutrition education

- Nutrition education should be a compulsory component of school curricula in all EU countries and efforts should be made to improve the attractiveness of its provision and ensure messages are enhanced with information on healthy lifestyles and the provision of attractive and healthy food in school canteens.
- Governments should take a lead in ensuring their own public sector workplaces encourage healthy lifestyles which include the provision of information and healthy options in canteen meals. They should evaluate the effectiveness of alternative approaches with a view to helping establish best practice.

5.4. Nutrition labelling

EATWELL has not conducted independent research into the effectiveness of nutrition labelling. What follows is based on our analysis of the literature.

Background

Nutrition labelling aims to inform consumers about the composition of foods and help them to make an informed choice.

Nutrition labelling of food products in the EU has been regulated since the Council Directive of 24 September 1990 on nutrition labelling for foodstuffs (90/496/EEC). Labelling, presentation and advertising of foodstuffs was also regulated by the directive 2000/13/EC.

Before their overhaul in 2011 (discussed later), these regulations only defined tabular/linear nutrition information which was voluntary unless a nutrition or health claim was made. The EU also regulates the labelling of nutrition claims, including those relating to health and reduction of disease risk (1924/2006/EC). A long history of labelling regulation is also associated with the US Nutrition Labeling and Education Act, introduced in 1990 and followed by labelling norms in 1993.

The debate over the effectiveness of nutrition labels has been quite active in Europe.

The EU project FLABEL (Food Labelling to Advance Better Education for Life) found that 70-97% of products from five food/drink categories audited (2008-2009) within the EU contained some form of nutrition information (Storcksdieck et al, 2010). The most widespread format used was the back-of-pack nutrition table detailing either the big 4 (calories, protein, carbohydrates, fat) or the big 8 (big 4 plus sugar, saturated fat, fibre and sodium/salt). The most prevalent form of front-of-pack information was Guideline Daily Amounts (GDAs), appearing on an average of 25% of labels across all products audited. GDAs present nutritional contents as a percentage of population recommendations for average estimated energy requirements and maximum intakes of sugar, fat, saturates and salt.

EATWELL's review of policies reported the most prominent national labelling schemes are the keyhole symbol adopted in Sweden, Norway, and Denmark, and the heart symbol adopted in Finland – these use nutrition criteria to determine whether a product qualifies to bear the health logo within a food or beverage category. Similarly, colour-coding has been used (voluntarily) to classify foods in terms of nutritional content, such as the 'traffic light' system launched by the UK Food Standards Agency (FSA).

Evaluation of evidence on policy effectiveness

EATWELL's 'Policies to promote healthy eating in Europe: a structured review of policies and their effectiveness' (Capacci et al, 2012) found that the literature tends to focus on consumer exposure to nutrition labelling, which is not a measure of impact on people's diet.

Assessments of the impact of labelling on food intake do not show conclusive results in terms of healthier purchasing choices. Grunert and Wills (2007) found grey literature from two UK retailers suggesting an increase in sales of healthier products with colour-coded Guideline Daily Amounts and Guideline Daily Amounts only, but this can only be considered anecdotal since there is no control for other factors and details are not reported. Sacks and colleagues (2009) analysis of sales data before and after the introduction of traffic light signposting schemes did not find any changes in sales of healthier options.

It has been suggested that the effectiveness of health logos may be limited to consumers already interested in their health, as the Dutch Choices logo had no influence on food choices in worksite cafeterias (included in the evaluation of 'menu labelling') (Vyth et al, 2011).

A review of the literature on nutrition labelling in Europe finds consumers are generally interested in nutrition information and they like and demonstrate understanding of common formats of nutrition information, but people tend to over-report their use of nutrition information. Furthermore studies that relate label use to healthier diets carry potential bias as label users are already likely to be health-oriented.

In 2008-2009, EUFIC and Grunert assessed actual consumer behaviour in stores, understanding and use of nutrition information on food labels across six European countries. Many respondents were aware of and understood existing nutrition labelling schemes present in each country. Furthermore, regardless of the labelling scheme, consumers were able to identify the most healthful option when given a choice of three pre-packed ready meal labels. Consumers' awareness, understanding and ability to make correct health inferences were linked to their nutritional knowledge, age, social grade and interest in healthy eating. The observational study saw across six European countries an average 16.8% of consumers look for nutrition information. Two-thirds of shoppers looked at the front-of-pack in detail before making a purchasing decision, but less than 15% looked elsewhere on the packaging. (EUFIC, 2009). It was noted that the UK subsample consistently had higher scores on both use and understanding than the other subsamples which suggests that an intensive public debate on nutrition and labelling issues can indeed affect people's thinking and behaviour.

Further qualitative consumer research in four European countries also found that consumers reacted positively to simple front-of-pack label calorie flags (van Kleef et al, 2008).

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

The OECD Report (Cecchini et al, 2010) evaluated food labelling as cost-effective, with the assumption that the intervention is mandatory with clear information about nutrient content and serving size. The Australian ACE—Prevention study (Vos et al, 2010) assessed the impact of front-of-pack traffic light nutrition labelling to also improve health and save money. Although in theory this type of intervention should affect all consumers, empirical evidence suggests that only two thirds of consumers actively read labels.

Additional comments (including new literature)

After years of negotiation, in 2011 the EC published the new Food Information Regulation (EU 1169/2011) which replaces general food and nutrition labelling rules of the directive 90/496/EEC of 1990 on nutrition labelling for foodstuffs and the directive 2000/13/EC.[REFs] Future impact evaluations examining before and after the introduction of the recent labelling regulations can be expected.

The new regulation makes nutrition labelling mandatory, and instructs food manufacturers to provide information on the energy value and 6 nutrients; fat, saturates, carbohydrate, sugars, protein and salt – in this order, and expressed per 100g or per 100ml of product.³ This information should be presented in a nutrition table in the same field of vision (most likely to be the back of the pack), and may in addition be expressed on a per portion basis. Further nutrients (i.e. monounsaturates, polyunsaturates, polyols, starch, fibre, vitamins and minerals) can be included voluntarily.

As it stands, the regulation only mandates that nutrition labelling is in the same field of vision, commonly on the 'back of pack'; labelling in the principal field of vision (e.g. 'front-of-pack') remains voluntary. If information is voluntarily repeated on the front-of-pack, specific rules apply.

Exemptions include unprocessed foods or items for which nutrition information is not considered a determining factor for consumers' purchasing decisions, or for which the packaging is too small to accommodate the mandatory labelling requirements. Alcoholic beverages are also provisionally exempt from the requirements to provide an ingredients list and nutrition information. However, within three years after the entry into force of the Regulation, the European Commission will examine this issue and, if necessary, propose amendments.

Taking into account evidence of uniform consumer understanding, the European Commission may introduce further requirements to express information in the form of pictograms or symbols instead of words or numbers. In addition to mandatory back of pack nutrition information, additional symbols or formats can also be provided voluntarily. These must not mislead the consumer in anyway and should be scientifically based.

The EU project FLABEL published its final results in 2012 (EUFIC2012). The project drew conclusions that providing information on key nutrients and energy in a consistent way on the front-of-pack appears as the most promising approach, be it limited in its effect on choice behaviour, with motivation and attention to labels appearing to be major bottlenecks. The addition of a health logo, or colour coding, in certain situations (especially under time pressure), may complement this effect. Attention to nutrition information on labels is increased through motivation in the form of a health goal (e.g. reducing energy intake for weight management).

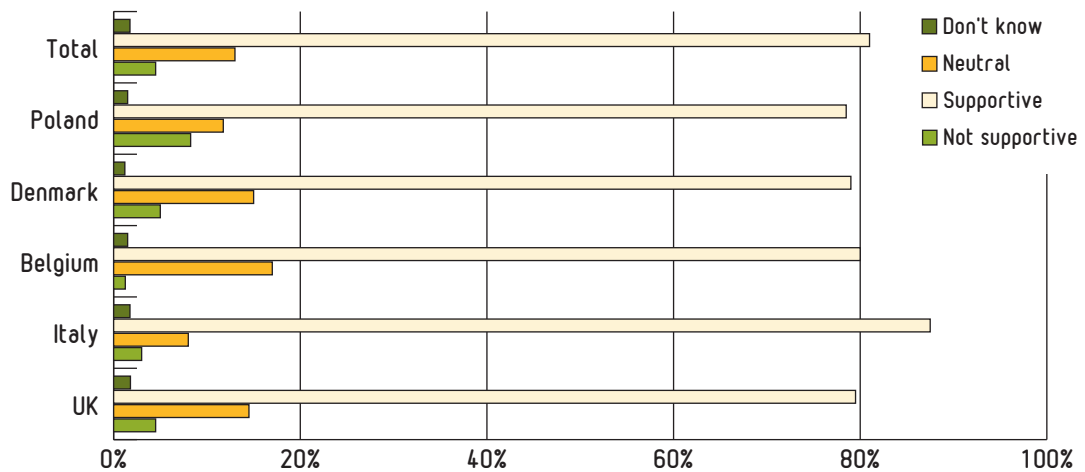
A review of studies examining label use with eye-tracking technology recommends mandatory front-of-package labelling. Graham and Jeffery (2011) found more attention is paid when the nutrition label is positioned in the centre (rather than sides) or the top (rather than the bottom) of the package, and to nutrients placed near the top of the nutrition label. Visual 'clutter' surrounding the nutrition label can lower attention to the nutritional information (Graham and Geffery, 2011; Graham et al 2012). Reducing other visual information found on a food package could increase attention to the nutritional label. These studies also recommend positioning nutrients of most public health relevance at the top of the label, enhancing visual salience (e.g. changing colour, contrast, orientation), increasing the surface size of the nutrition label and simplifying health messages on the label for making nutrition information easier to locate and comprehend.

The results of FLABEL suggest that in fact a healthier assortment of products will have stronger effects on promoting healthy choice, than label information. There is evidence to show that disclosure of information regarding nutritional content can motivate product reformulations, this has been observed with traffic light labelling (Sacks et al, 2009), and logo schemes such as the Dutch Choices logo (Vyth et al 2010). The criteria set for the Choices logo resulted in significantly lowered levels of sodium in existing products, and higher fibre content of newly developed products and lowered levels of saturated fatty acids and added sugars in dairy products (Vyth et al 2010). Based on purchase behaviour of products with the Choices logo in 2007 (market shares), it was estimated to reduce dietary intake of saturated fatty acids by 2.5% and sugar by 1% (Temme et al, 2011).

Public acceptance

Actions on nutrition labelling are those most supported after education measures for children. Overall, 81% of respondents are supportive of this type of action (78% in Poland, 87% in Italy), and only 4.4% declared to be not supportive.

> All foods should be required to carry labels with calorie and nutrient information



Points put to stakeholders for discussion

Nutrition labels allow healthier food choices, but impact on diet is limited by actual use. However, it may be argued on ethical grounds that consumers have a right to know what is in the food they eat. A majority of the public supports this policy measure that provides them with nutrition information on food packages.

- Clear, concise and consistent information on labels should be given; such measures are recommended on ethical grounds and to support informed choice, but we do not have the evidence regarding their effectiveness in behavioural change. Consumers are able to differentiate healthier choices using labels but doing this whilst shopping is heavily dependent on motivation and attention. These aspects must be targeted in order to improve the potential effectiveness of nutrition labelling.
- A simplified, consistent, compulsory front-of-pack label should be introduced for all processed food sold in the EU.

Stakeholder feedback

All stakeholders agreed with the principles laid down by the new Food Information Regulation (FIR). Nutrition information provided should be simple, clear and consistent. There was support for front-of-pack labelling provided this does not compromise simplicity. However some stakeholders, particularly industry, tended to disagree with front-of-pack information being compulsory. It was commented that it might be unrealistic to agree on at an EU-level and suggested that requirements further to the FIR could be delegated to Member States, supported by independent consumer research. However there was concern about having too many different labels and adding to confusion. It was advised that nutrition labelling as an incentive for product reformulation should also be part of the recommendation.

EATWELL response to stakeholders and new information

We agree with the feedback and the recommendations have been revised to acknowledge the new legislation on nutrition labelling.

Final recommendations on nutrition labelling

- Since nutrition label use is limited by motivation and attention and more consumers look front-of-pack, we would encourage the (initially voluntary) provision of simple information on the front-of-pack, in a consistent format and positioning. This should be based on insights from consumer research and eye-tracking technology. The effectiveness of colour-coding or a health logo should be further evaluated.
- Nutrition labelling should be combined with initiatives targeting health motivation and education of the labelling scheme of choice.

5.5. Nutritional information on menus

EATWELL has not conducted independent research into the effectiveness of nutrition information on menus. What follows is based on our analysis of the literature.

Background

Across Europe, an estimated 12%-28% of dietary energy is eaten outside the home (by adults over 35 years) (Orfanos et al 2007). The growth of consumption away-from-home, the demand for tasty and convenient food (combined with the lack of disclosure of information) is thought to have driven supply that is of poor nutritional quality (Variyam, 2005). Eating out-of-home is associated with higher energy and fat intake and lower micronutrient intake (Lachat et al, 2012).

Studies such as Burton and colleagues (2006) have found that consumers tend to underestimate the levels of calories, fat and sodium commonly found in items consumed out-of-home. Plus Chandom and Wansink (2007) proposed the theory of 'health halo bias' where the level of accuracy of the estimated nutritional content is associated to the reputation of the food outlet (underestimation associated with restaurants claiming to be healthy). Therefore this type of policy, providing information at the point of choice, promotes informed choice.

In Europe the provision of nutrition information on menus in restaurants or cafeterias has often formed part of wider information or labelling programs (e.g., the Portuguese Platform against Obesity, or the Swedish Keyhole), or as a result of voluntary actions of some fast-food chains (EATWELL Deliverable D1.1).

Outside Europe, the regulation of nutrition information provided on menus is gaining popularity in the United States, to the point that the recent reform of the health system in 2010 included a measure requiring restaurant chains (20 or more locations across the country) to display the calorie content of foods on menus or menu boards. Similar regulations have already been implemented in a number of US states (US Congress 2010).

Evaluation of evidence on policy effectiveness

The introduction of nutritional information on menus is recent and insufficiently widespread and empirical evidence about actual eating outcomes is weak (Mazzocchi, Traill and Shogren, 2009).

In an experimental study by Burton and colleagues (2006) the provision of nutrition information decreased purchase intention and choice (hypothetical) when the nutritional profile was less healthful than expectations. For example, the salad contained moderate calories and exceeded levels of fat and saturated fat expected by consumers, less people said they would choose the salad when the nutritional information was shown.

Roberto et al (2009) observed that only 6 (0.1%) of 4311 patrons accessed on-premise nutrition information before purchasing food. In advance of the legislation, Bassett and colleagues (2008) also found that less than 5% of customers saw calorie information where it was provided in less prominent formats (e.g. posters or website). In Subway restaurants where calorie labelling was posted at point-of-choice, 32% said they saw the information, and purchased 52 fewer calories than those who did not. Those who reported seeing and using calorie information purchased 99 fewer calories (than those who said they saw the information but it did not influence their purchase). Hence, US legislation required the information to be made visible, i.e. at point-of-choice.

Early evaluations of the introduction of calorie labelling in the US were not positive, for example Elbel et al (2009) found that 27.7% who saw calorie labelling in New York said the information influenced their choices, but the researchers did not detect a change in calories purchased.

Calorie labelling could have unintended consequences. Some early small intervention studies have suggested certain groups including men and some adolescents could possibly use nutrition information to select higher-calorie items (e.g. Aaron et al 1995; Harnack et al 2008).

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

None.

Additional comments (including new literature)

Further evaluations pre and post the US legislation have reported high awareness of calorie labelling but, based on receipt data, found minimal change in calories purchased. One study (Bollinger et al. 2011) of sales data from Starbucks shows a 15 calorie saving per transaction (6% reduction). Bollinger and colleagues (2011) also suggested a salient effect, where calories become more important in purchase decisions, and a learning effect since Starbucks customers also reduced their calorie intake at outlets where there was no calorie information. More studies are needed to confirm this. Dumanovsky and colleagues (2011) found that 15% (1 in 6) of customers reported using the information and their purchases contained 106 fewer calories (than those who said they did not). However, they also reported a rise in calories purchased at one chain when large portions were heavily promoted (“\$5 foot-long” at Subway). Vadiveloo and colleagues reported mixed results but suggest menu labelling may have other effects such as reducing the frequency of fast food consumption (Vadiveloo et al 2011), because adults who reported noticing calorie labels ate at fast food restaurants less often than those who did not see the labels.

An experimental intervention conducted in a laboratory setting, by Roberto and colleagues (2010), randomly assigned participants to menus with calorie and reference information on recommended daily caloric intake. Calorie labelling reduced the total amount of calories ordered and consumed for the meal. Dietary recalls were conducted the following evening. Only individuals given calorie plus reference information ate less energy (250 fewer calories) during and after the study dinner. However, self-reported intake may be biased. This reference information was included in another experimental study, by Harnack and colleagues (2008), who found calorie labelling had little effect on calorie intake.

The introduction of the Dutch Choices logo in 13 work site cafeterias led to no significant effects on food choice or behavioural determinants. The study concluded that labelling healthy choices might be useful for health-conscious individuals in the volitional phase of behaviour change and further research should look at combining labelling with education, for example via technologies such as mobile phones (Vyth et al 2011). Research should also focus on reformulation as disclosure of nutrition information may also drive businesses to modify ingredients/cooking methods, portion size, and default options.

The current evidence base is short-term and cannot account for the effects of long term exposure to labels, on total diet consumption, nor environmental factors such as public education campaigns and the potential influence of taste, price, social norms and situational cues in the context of eating out (e.g. in a restaurant) (Swartz et al, 2011).

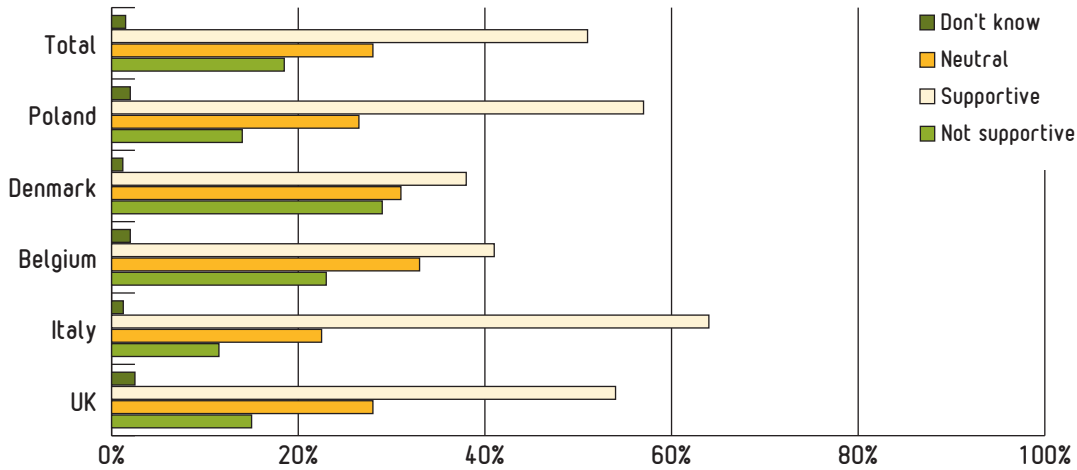
Allison (2011) recommends conducting a cluster-randomized trial which could be created by randomly introducing menu labelling in a number of regions of a country and at the same time monitoring the same number of regions without menu labelling, to assess sales data and diet and body weight/fat of enrolled subjects.

A voluntary scheme of providing calorie information at point-of-choice (similar to the US) for food and non-alcoholic drinks was established in England (by the UK Food Standards Agency, responsibility now delegated to the Department of Health). This scheme has been shaped by consumer research that identified the need for standardised and credible point-of-choice information, and a ‘trade-off’ between the amount of information offered and likely engagement. This has become part of the Government’s ‘Public Health Responsibility Deal’ (September 2011). Companies have also pledged to reduce salt and remove trans fats from their menu and support customers to eat and drink fewer calories for example by reformulation, portion sizes and education. The UK Department of Health provides illustrative and technical guidance on sourcing nutrition information, and intends to produce specific guidance targeted at small businesses.

Public acceptance

A relatively low percentage of respondents is supportive of the introduction of nutritional information on restaurant menus (50.9). Italy (63.9%) and Poland (57.1%) gave relatively higher rates of support, but still in these countries, this policy ranks among the least supported.

› All restaurants should be required to give calorie and nutrient information in menus



Points put to stakeholders for discussion

Menu labelling may only have a limited effect on overall diet and lifestyle choices. Disclosure of nutrition information enables informed choice, although this policy is not strongly backed by public opinion.

- The European Commission should begin consultation with a view to enacting legislation similar to that in the US, making caloric labelling compulsory in chains with more than 20 restaurants.
- In the meantime the influence of US and UK policy on nutrition labelling in the catering sector should be closely monitored and further evidence collected on the benefits of labelling other nutrients.

Stakeholder feedback

There was disagreement on the recommendation that menu labelling should be a statutory requirement. The current evidence base is still limited with mixed and some weak methodologies. It was advised that a strong evidence base is needed before legislative measures. Evaluations need to include further nutrients and approaches (such as logos) in the out-of-home setting should be gathered. It was suggested that such labelling could be harmonised with labelling formats used on packaging to research synergistic effects, e.g. Denmark suggested the keyhole symbol. One group suggested marking “healthier/light choices” but this was controversial.

There was some support for a non-legislated recommendation of menu labelling for informed choice, with strong support to include small and medium-sized enterprises in any such policy. However, there was wide concern over the costs and technical difficulties faced by the catering industry. Other menu improvements such as the choice of smaller portions for everyone, were recommended.

EATWELL response to stakeholders and new information

We agree, given the limited evidence base, that a legislative requirement is premature. As more voluntary initiatives are in place, these should be evaluated scientifically for effectiveness, before legislation.

Final recommendations on nutritional information on menus

- The provision of nutrition information in food restaurant chains is recommended for informed choice and the potential for positive menu changes. To strengthen the evidence base, menu labelling in the US and other real-life experiments should be closely monitored. Introduction of such an intervention should be implemented in a way that allows rigorous evaluation including the technical challenges faced by caterers in providing nutrition information.
- Menu labelling should also be combined with initiatives targeting health motivation and education of the labelling scheme of choice.
- Menu labelling should be considered in conjunction with wider initiatives, working with caterers (e.g. reformulation, portion sizes, pricing strategies, health promotion and education) to make it easier for consumers to make healthier choices out-of-home, which should also be monitored and evaluated.

CHAPTER 6



6. EVALUATION OF POLICY MEASURES CHANGING THE MARKET ENVIRONMENT

Although information measures constitute the largest proportion of interventions for encouraging healthy eating, economists and health researchers have argued that more direct measures could have a bigger impact on behaviour and health. After all, the inherent diseases related to unhealthy eating impose costs on the rest of society in the form of health care costs and lost production. Therefore, supporters of these types of measures argue that it is more effective and fair to pass the costs to the people that are creating them. Consequently, the policies included in this category are designed to influence healthy eating by changing the market environment. Generally this can be achieved through the introduction of taxes and/or subsidies (fiscal measures) which aim to influence consumption by changing relative prices of 'good' and 'bad' foods or nutrients; and measures to influence the availability of foods or nutrients for consumption. These methods are more intrusive than information measures and it has been argued they represent undue 'nannying' by the state, even though similar measures are commonplace with respect to alcohol and tobacco.

6.1. Fiscal Measures - Taxes and subsidies to the population at large

There has been no independent research on fiscal measures within EATWELL. What follows is based on our analysis of the literature and government reports.

Background

Fiscal measures are taxes or subsidies designed to change the relative prices of healthy and unhealthy foods or nutrients (sometimes referred to as fat taxes and thin subsidies). These fiscal measures may also be introduced through changes in value-added tax (VAT) rates of food categories.

Denmark, on 1 October 2011 became the first country in the world to tax saturated fats, at the rate of €2.15 per Kg of saturated fat in foods with more than 2.3% saturated fat. From September 1, 2011 the Hungarian government introduced new taxes on various pre-packaged foods with high salt and sugar contents, crisps, salted nuts, chocolates, sweets, biscuits, ice creams and energy drinks. It estimates that the taxes will produce yearly revenues of around €74m and that the money will be used to finance the health-care system. According to the government, the new levy is justified (at least in part) by the fact that those who live unhealthily have to contribute more to support the health system. France has introduced in January 2012 a €7.16 per hectolitre tax on caloric soft drinks, expected to raise €200m per year. Finland reintroduced a sweets tax in January 2011. In the United States, so-called "twinkie taxes" have been implemented in 30 states. The low level of these taxes (applied to foods and drinks of low nutritional value, especially sodas), combined with inelastic demand, makes them ineffective in terms of addressing behaviour, and published evidence of their effect on body mass index or obesity prevalence is weak (Capacci et al, 2012). However, they generate large tax revenues that have been used to fund alternative health and nutrition interventions.

Arkansas's tax on soft drinks generates about \$40 million per year, and California's tax on soft drinks generates about \$218 million annually (Capacci et al 2012). Nationally in the United States, twinkie taxes raise about \$1 billion per year.

Evaluation of evidence on policy effectiveness

The European interventions have all been introduced too recently for their effectiveness to have been assessed. However, there have been a large number of academic studies that simulate the potential effects of fiscal measures by using estimates of elasticities (consumption responsiveness to changes in relative prices).

It is not possible here to review an increasingly abundant literature with any degree of comprehensiveness, but there have been a recent systematic review for WHO (Thow et al, 2010) and a structured literature search and review (Faulkner et al 2011) that cover much of the relevant academic work. Some broad conclusions may be drawn.

Measuring the direct impact of taxes and subsidies on BMI is complex given the long time lags for weight to adjust fully to a change in diet, so studies typically employ indirect measures based on changes in overall energy consumption from aggregating the impact of price changes on all individual foods using household survey data (see reviews in Cash and Lancanilao, 2007, Powell and Chaloupka, 2009, Thow et al, 2010). Such studies suggest that moderate taxes and subsidies (under 20%) would only have a small impact on calorie intake, though given the sensitivity of BMI to small changes in energy intake, the impact on BMI could be more substantial⁴. The effect on consumption depends on how the tax is imposed and the structure of the market, both of which influence pass-through to consumers (Griffith et al 2010).

Most substitution is within rather than between food groups, meaning that price changes between broad food groupings (e.g. meat, fruit and vegetables) show a smaller impact on consumption than price changes of closely related products (e.g. based on saturated fat levels in yellow fats or caloric vs. non-caloric soft drinks) (Griffiths et al, 2008, 2010; Smed et al, 2007). Most studies use aggregate food groupings that preclude such analysis, Griffiths et al (2008) who use check-out data, is an exception.

Some studies have identified undesirable side effects of fiscal measures such as a tax on saturated fat potentially increasing salt intake (Mytton et al, 2007) or a subsidy on wholemeal bread increasing fat, salt and sugar intakes unless taxes were simultaneously imposed on those nutrients (Nordström and Thunström 2009; Mytton et al 2007) suggest harmful side effects of a fat tax could be offset if taxes were instead based on a nutrient profiling system.

The distributional consequence of taxes and subsidies has been a subject of particular interest. In general, 'sin taxes'⁵ are regressive—they fall proportionately most heavily on lower income groups who spend a higher share of their incomes on such products. The same is true of taxes on food (see e.g. Allais et al 2009, Tiffin and Arnoult, 2011, Leicester and Windmeijer, 2004; Chouinard et al, 2007). More surprisingly, fruit and vegetable subsidies may also be regressive since lower income groups consume fewer portions of these products than higher income groups and so receive fewer of the subsidy payments (Tiffin and Arnoult, 2011).

Although the financial consequences of fiscal measures are regressive, the health benefits are progressive—they are greatest for the poor (e.g. Smed et al 2007, Nnoaham et al, 2009, Allais et al, 2009). This is because low income groups generally consume more 'unhealthy' foods, are more obese, and are more responsive to prices, so compared to their high-income counterparts they would cut back more on products that are taxed (or increase more their intakes of subsidised foods).

4. Relations between body weight and changes in energy intake depend on genetic factors and on body weight itself—thus a sustained increase in calorie intake results in a new steady state equilibrium at higher weight (Harris and Benedict, 1918). However, a crude approximation is that 3,500 Kcals add 1 lb in weight. To add 1 BMI unit, a 6 footer would need to add approximately 7 lbs requiring 24,500 calories, 67 calories per day for a year. This almost exactly equals the average adult increase in BMI in the UK from 1993 to 2009, from 25.9 to 27.0 (Health Surveys for England)

5. Taxes on products like alcohol and tobacco.

In calculating the impact of fiscal measures on BMI and health, some researchers have used an epidemiological odds ratio (relative risk) to convert nutrients/foods/BMI into health outcomes, for example Mytton *et al.* (2007) show that up to 3200 deaths from cardiovascular disease could be avoided in the UK through a fat tax on a wide range of foods, and Marshall (2000) demonstrates that a tax on dietary saturated fat could avert up to 1000 deaths a year in the UK. Wang *et al.* (2012) found that a cent an ounce tax on caloric soft drinks in the US would reduce consumption by 15 percent among 25–64 year olds. Based on simple epidemiological relationships they claim this would prevent 2.4 million diabetes person-years, 95,000 coronary heart events, 8,000 strokes, and 26,000 premature deaths, while avoiding more than \$17 billion in medical costs and generating approximately \$13 billion in annual tax revenue.

The body of evidence suggests taxes on foods and nutrients result in small behavioural responses and large tax revenues (Capacci *et al.*, 2012). However, simulation studies indicate that larger tax rates might have a substantial impact on consumption and health (Mytton *et al.* 2012; Brownell and Frieden, 2009; Fletcher *et al.*, 2010; Mytton *et al.* 2007; Andreyeva *et al.*, 2010).

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

The OECD Report (Sassi *et al.*, 2009; Cecchini *et al.*, 2010) estimated cost effectiveness of an intervention which used fiscal measures to increase the price of foods with high fat content by 10% and to decrease prices of fruits and vegetables, also by 10%. There were no assumptions regarding the specific measures that would be taken to achieve these prices. ACE-Australia assessed the impact of a 10% tax on unhealthy food. Both studies reported that the interventions would improve health *and* save money.

Cash *et al.* (2005) estimate that a 1% decrease in price for all fruit and vegetables could translate in the US into a mean decrease of around 6,700 cases of coronary heart disease and almost 3,000 ischemic strokes. They calculate that the cost of such policy intervention in terms of expenditure per life saved, on average \$1.29 million, is below the common evaluation of the value of statistical life.

Additional comments (including new literature)

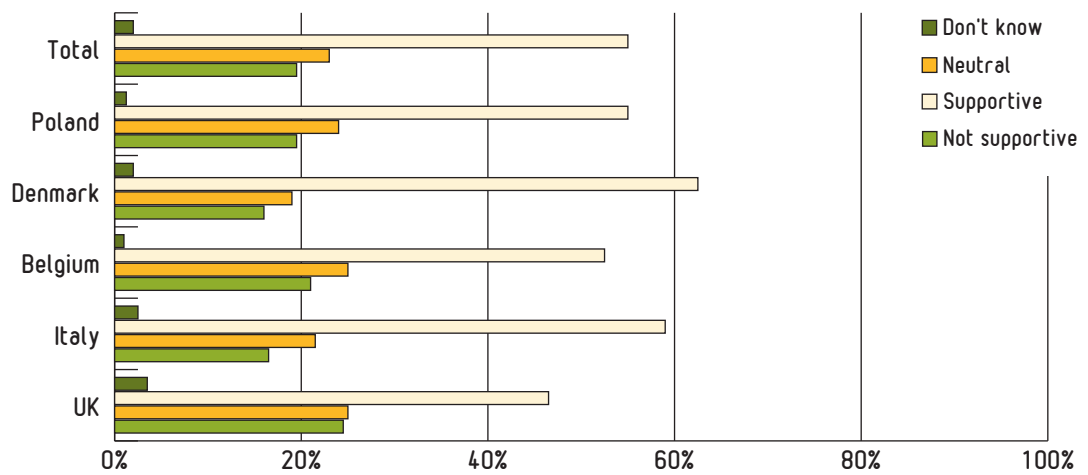
The issue of fiscal interventions has continued to be a controversial subject with a lot of activity including new research investigations and reports with recommendations. The new research does not significantly alter any of the judgements discussed above, though Mytton, Clarke and Rayner (2012) report a small number of controlled trials not discussed in the *Nutrition Reviews* article (Capacci *et al.*, 2012). They find a 35% tax on sugar sweetened drinks in a canteen led to a 26% decline in sales, but recognise the artificial nature of such controlled experiments and that compensating behaviour might occur. Wansink *et al.* (2012) suggest the beneficial effects of a soda tax may be short term. A study by the European Heart Network (2011) recommended that “Governments should explore the potential for subsidies on healthy foods, which may be used in conjunction with higher taxes on unhealthy foods. Although EU member states are bound by EU rules on Value Added Tax (VAT), there is still considerable scope for action” (p151). In his December 2011 report, the UN Special Rapporteur on the right to food, Olivier de Schutter (2011) called for the imposition of taxes on soft drinks (sodas), and on HFSS foods, in order to subsidise access to fruits and vegetables and educational campaigns on healthy diets.

Public acceptance

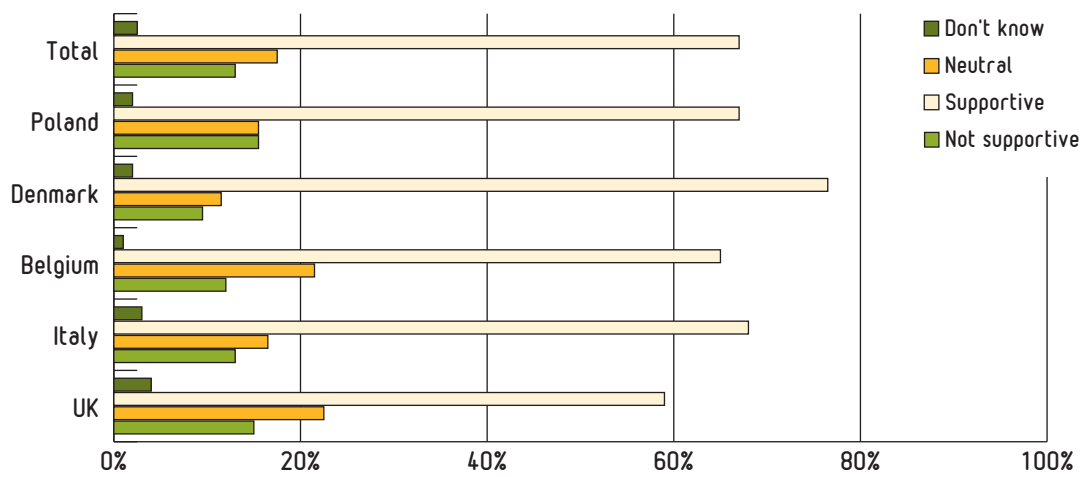
Taxes receive relatively low support. The survey question asked about taxation on unhealthy food used to promote healthy eating and was supported by 55% of those surveyed. Support for the introduction of such taxes is significantly higher in Denmark (62.6%), where only 4 other policies receive more support (education, labelling, price subsidies and VAT measures). Support for the use of differential VAT rates for healthy and unhealthy foods received more public support, around 63%.

The survey also asked about subsidies on fruit and vegetables to promote healthy eating. Such measures received support from 70.1% of the EATWELL survey sample. There are major differences across countries, and the percentage falls to 59.6% in the UK. Denmark – again – stands out as being extremely supportive of this type of measure: 72% of respondents are supportive.

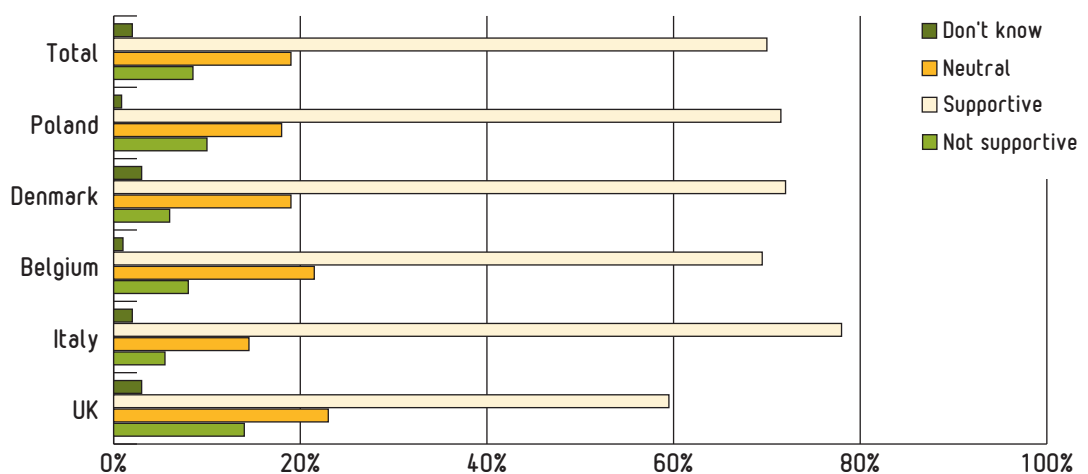
> The government should impose taxes on unhealthy food and use the proceeds to promote healthier eating



> VAT rates should be lower for healthy foods and higher for unhealthy foods



> The government should subsidise fruit and vegetables to promote healthier eating



Points put to stakeholders for discussion

Moderate levels of taxes on foods or nutrients would not bring about significant changes in diets or public health. They would however be cost effective and they could raise significant levels of revenue to partially offset the social costs of unhealthy eating.

- A good starting point would be to tax caloric soft drinks. Unintended nutritional side effects would be minimal and revenue raising potential would be substantial.
- The experiences of the taxes introduced in Denmark, France and Hungary should be closely monitored, with a view to extending taxes to other foods and potentially, if practical difficulties of implementation could be overcome, to nutrients whose consumption exceeds WHO recommended levels, perhaps using a nutrient profiling approach.
- The regressive nature of the measures is insufficient argument against the imposition of such taxes; after all, alcohol and tobacco taxes are widely accepted, and harmful distributional consequences can be offset through general taxes and benefits.
- Despite their popularity among the public, subsidies for fruit and vegetables would be too expensive, as well as economically regressive.

Stakeholder feedback

(a) Tax caloric soft drinks

The response was mixed. There was general agreement among policy makers in Poland, Italy and Denmark and consumers in Italy, Denmark and the EU that taxes were desirable, albeit in most cases with provisos. Policy makers in the EU argued taxation was a matter for Member States, not the EU. Industry was uniformly opposed to food taxes.

Those who supported taxes emphasised the importance of using the proceeds to support healthy eating measures and for off-setting harmful impacts on the poor. They were generally of the view that rather than soft-drinks alone, a broader range of foods/nutrients should be targeted, perhaps using nutrient profiling. It was mentioned that tax rates should not be substantially different across the EU. There was a suggestion (in Denmark) that substantial taxes would be appropriate.

Opponents argued there would be a limited impact on public health, that there are no bad foods only bad diets, that they are regressive, and to beware of unintended consequences.

(b) Subsidise fruit and vegetables

The majority of stakeholders would not like to see fruit and vegetables subsidised. Concern centred around market distortion and cost effectiveness. The exceptions are Italian and EU level consumers association representatives in Italy and the EU who support the use of subsidies, the latter asking why subsidies should be rejected if they are as popular as indicated by the survey. In Denmark and the EU-level workshop in Brussels the question was asked whether fruit and vegetable subsidies would be the most cost-effective way of spending a limited healthy eating budget.

In Denmark, it was pointed out that vegetable consumption needed more encouragement than fruit—it was wrong to consider ‘fruit and vegetables’ as a single group.

(c) Differential VAT rates

No comments received.

(d) Monitor experience in other countries

There was agreement that this was important.

EATWELL response

A major argument of industry and some consumer groups against taxes is their regressive nature, but it is generally accepted that income distribution is a matter for the general tax and benefits system (see e.g. UK Cabinet Office Report, 2008, *Food Matters*). Virtually all consumption taxes (VAT, alcohol, tobacco) are regressive but they play a valuable role in raising revenue and promoting social welfare by making people pay closer to the full social cost of their actions.

We reiterate that both taxes and subsidies would reduce health inequalities because poorer groups are more responsive to price changes.

We do not accept the argument against taxing individual nutrients or foods, indeed the recommendation to tax soft drinks was based on the dominant view in the literature and among experts (see references above and Faulkner, 2011) that such a measure would promote public health, raise revenue and have limited harmful side-effects. However, we do accept that a broader nutrient-profile based tax might be more acceptable.

We accept that the impact of low-level taxes on public health would be modest. However, the main argument in favour of fiscal measures is that they are a cost effective way of off-setting some of the costs of unhealthy eating. We accept the argument that taxation is more likely to be accepted if the proceeds are targeted at promoting healthy eating or even reducing other taxes and that therefore the proceeds of any tax should be ring-fenced. Provided those proceeds were used to finance policies with cost-effective public health benefits, the net effect of the package of measures would inevitably be cost effective. We also agree that subsidising fruit and vegetables is not necessarily the most advantageous use of the proceeds of a tax.

We agree with those who argue that only a relatively high tax would cause fundamental changes in consumer behaviour, but such moves do not appear realistic at this time.

Overall, we still believe the evidence-base is now sufficient for Member States to work towards introducing targeted taxes on specific foods and/or nutrients. However, the optimal form of such taxes needs further assessment and for this, monitoring the effects of the measures undertaken in Denmark, France, Hungary and Finland is a priority. Other options such as nutrient profiling should also be considered.

Final recommendations on fiscal measures to the population at large

- Member States should work towards introducing taxes aimed at promoting healthier eating and raising revenue for other healthy eating programmes. The precise form of the tax may vary across Member State and should be informed by careful evaluation of the impacts of the recently introduced taxes in Denmark, Finland, France and Hungary and an assessment of additional alternatives such as nutrient profiling.
- The revenue from the tax should be ring-fenced for use in other cost-effective healthy eating policies.

6.2. Fiscal measures targeting disadvantaged consumers

EATWELL has not conducted independent research into the effectiveness of interventions to provide financial assistance for disadvantaged consumers. What follows is based on our analysis of the literature and government reports.

Background

In the United Kingdom, “Healthy Start” is a government scheme to provide a nutritional safety net for pregnant women, new mothers and children up to four years of age in very low income families. They receive free vouchers that can be exchanged for cow’s milk, fresh and frozen fruit and vegetables, or infant formula milk and in addition are eligible for free vitamin supplements. A similar scheme supporting children’s nutrition in disadvantaged families has existed in Poland since 2005. In the United States, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was started in 1972 and provides supplemental foods designed to meet the special nutritional needs of low income pregnant women, postpartum women, infants, and children up to 5 years of age who are at nutritional risk.

The Food Stamp Program, now the Supplemental Nutrition Assistance Program (SNAP) in the US, was originally designed to encourage the consumption of surplus farm commodities as well as acting as a welfare scheme for poor families unable to afford an adequate diet. SNAP places relatively few restrictions on food expenditure categories—it is more of a general welfare programme, its main restriction being that vouchers are spent on food. The average size of SNAP payments is \$276 per household compared to WIC average payments of \$30.

Evaluation of evidence on policy effectiveness

The WIC program has been evaluated extensively. According to USDA (2009) the benefits include that participant children record higher mean intakes of iron, vitamin C, thiamin, niacin and vitamin B6, without an increase in food energy intake, fat or cholesterol; the scheme has even proved to be more effective than similar or parallel schemes at improving preschoolers' intake of key nutrients; at risk infants and children show improved growth rates; there were reduced rates of foetal death and infant mortality. The UK Healthy Start programme is reportedly scheduled for evaluation in late 2012.

SNAP in the US has been more controversial, with some research suggesting it has increased obesity prevalence among recipients (e.g. Zagorsky and Smith (2009), but the balance of evidence does not support this view and “overall, the literature suggests that vouchers for healthy foods targeted to low-income consumers are an effective way of increasing fruit and vegetable consumption” (Brambila-Macias, 2011) Studies comparing how households use US food stamp vouchers and cash distributions of similar value have found that vouchers result in two to ten times more nutrient availability for households compared to cash (Barrett 2002).

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

In the words of the USDA (2009) “The results of studies conducted by FNS and other non-government entities prove that WIC is one of the Nation's most successful *and cost-effective* nutrition intervention programs”. Abrams (1993) reported that WIC saves money, every WIC dollar reducing Medicaid payments by \$2.89 in infants' first year and \$3.50 from birth to 18 years of age.

For SNAP, cost-effectiveness depends what the alternative would be. If it is assumed cash equivalent welfare payments would have to be paid to the poor in the absence of SNAP, the only cost of SNAP is administrative and these (small) costs would have to be set against the nutritional benefits found from the program. Although we have not seen a monetary value attached to these, there seems little doubt the balance would be favourable.

Additional comments (including new literature)

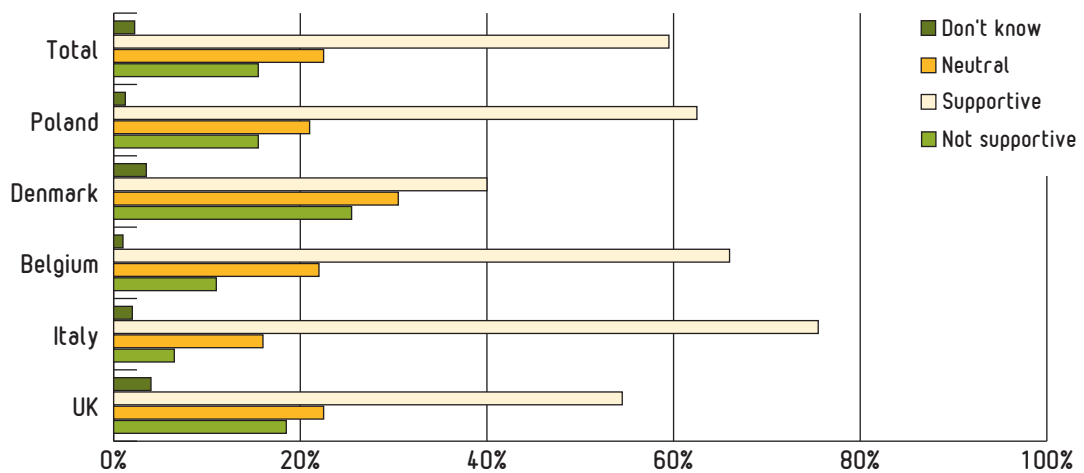
A recent paper (Tripp, Henderson and Andreyeva, 2012) reviews the literature on effects of SNAP and WIC participation. It reports both WIC and SNAP are effective in reducing household food insecurity. Using supermarket scanner data and controlling for socio-economic factors, they find SNAP households spend a smaller share of their food expenditure on fruit, vegetables and dairy, and a higher share on desserts, sweets and snack-foods compared to WIC recipients and recipients of both WIC and SNAP. Lentz and Barrett (2012) review various evaluations of WIC and SNAP and state positive effects of WIC on birthweight, child growth and dietary status. Part of the benefit may come from coupling food assistance with child growth monitoring and health consultations (Lentz and Barrett 2012, p16). Meyerhoefer and Yang (2011) report that SNAP recipients spend more on food than do non-participants with equivalent post-transfer incomes.

As stated above, SNAP places few restrictions on type of food expenditure by recipient households. Were it to do so, the public health benefits would certainly be even greater.

Public acceptance

In the EATWELL survey people were asked the extent they agree or disagree with the statement “*The government should provide vouchers to low-income families to buy healthy foods at reduced prices*”. Support for this policy is 59.7 % across the four survey countries, and is lowest in Denmark (39.9%). However the low support in Denmark for subsidising low-income families should be considered alongside the finding that the Danish public supports price subsidies for the whole population.

> The government should provide vouchers to low-income families to buy healthy foods at reduced prices.



Points put to stakeholders for discussion

Subsidies to disadvantaged consumers, especially in the form of vouchers targeting infants and single mothers, are not widespread within Europe. However, the American success through the WIC programme sheds some light on the potential for this type of intervention.

Guaranteeing an adequate and healthy diet to individuals from early stages of life could have an enormous impact on their future and encourage them to continue with a healthy diet during their adult life. Of course, the schemes may be costly, depending on their scope and eligibility criteria.

- Healthy eating vouchers to poor parents of infants are a highly cost-effective means of improving diets of disadvantaged groups. EU member states should make every effort to find the resources needed to adopt such schemes.
- Governments should consider going further. If a portion of existing benefits to low-income consumers was provided in the form of healthy eating vouchers (i.e. not just parents of young children), the scheme would be relatively cheap.

Stakeholder feedback

Feedback was rather mixed. Policy makers and consumers in Italy and Poland, as well as industry groups in Italy, supported the proposals. In Denmark there was concern that vouchers were not a very Nordic approach and similarly industry stakeholders in the EU workshop argued that the overall benefit system was different in the US. There was some concern that vouchers could be stigmatising to users and industry representatives in the EU group felt vouchers should only be considered as part of overall healthy eating activities. Some stakeholders also felt that defining healthy foods would be problematic and suggested instead making them available for basic foods.

EATWELL response to stakeholders and new information

We accept that a one-size-fits-all approach is not feasible and recognise that food assistance may not be appropriate for all Member States given their diversity of cultures and welfare systems. Concern about stigmatising consumers has already been addressed in the US by making all benefits electronic and 'invisible', so this is not a valid concern. The evaluation of the UK Healthy Start scheme will be valuable, the US schemes have been comprehensively reviewed and found to be cost effective and we believe there is sufficient evidence to act. We recognise defining healthy food is problematic, but we are not convinced defining basic food would be easier; such practical matters would have to be sorted out in detailed policy formation. We therefore stand by our preliminary recommendations, with minor amendment.

Final recommendations on fiscal measures targeting disadvantaged consumers

- EU member states should recognise the cost effectiveness of food assistance programmes like WIC targeted at pregnant women and those with young children and should examine ways they can be made to fit within their existing welfare systems.
- They should further examine whether a US SNAP-like scheme targeted at disadvantaged adults, using vouchers restricted to ‘healthy’ food groups, could be incorporated into welfare schemes, replacing a component of present cash transfers with a view to improving diets of the disadvantaged.

6.3. Availability measures for disadvantaged consumers

EATWELL has not conducted independent research into the effectiveness of interventions to improve healthy food availability for disadvantaged consumers. What follows is based on our analysis of the literature and government reports.

Background

An issue that has been widely debated is whether certain geographic areas, generally poor and urban, may be considered to be *food deserts*, places with an absence of supermarkets and a population with limited car ownership, where it is physically difficult or expensive to buy healthy food. Availability measures refer to interventions which address physical availability through measures to encourage convenience stores located in the area to stock more and better quality produce, notably fruit and vegetables. Two programs for disadvantaged consumers were identified in Europe, notably in Scotland, where government subsidisation of display cabinets for fresh fruit and vegetables is provided to shops located in low-income areas (this program is now extended to parts of England as well), and Denmark.

In the Scottish case, the government ran a pilot programme called “Healthy Living Neighbourhood Shops” in close collaboration with the Scottish Grocers’ Federation (representing convenience stores throughout Scotland) with the final aim of increasing availability of healthier foods where previously few options existed. The scheme relied on making it financially viable for convenience stores to, for example, stock more fruit and vegetables. This was achieved through subsidisation of fruit and vegetable display cabinets, displaying pieces of fruit at checkouts rather than confectionery, or moving fruits and vegetables from the rear of the store to the front and increasing the range of fruit drinks while decreasing the range of carbonated drinks. A similar pilot-scheme was introduced in England under the auspices of Change4Life. In Denmark, the Danish Cancer Society initiated in 2005 a three-year project (“Food in Motion”) furthering the availability of healthy food and beverages for children and young people who practice sports in Danish sports clubs.

Evaluation of evidence on policy effectiveness

In the Scottish case, moving fruit from the back to front of the store increased fruit and vegetables sales by 36% during the first week of its implementation and by 62% thereafter (it should be noted that these are the outcomes of a few selected stores, not an average), while increasing the range of fruit drinks led to a 14.6% increase in total soft drink sales with a corresponding 21% increase in cash profits (Department of Health, 2010).

In England, the Department of Health (2010) conducted a broader evaluation looking at direct feedback from participants, analysing sales data and surveying consumers’ views of the participating stores, the program itself, their fruit and vegetable consumption habits as well as self-reported consumption of fruit and vegetables. Results suggest that the policy has been successful in raising fruit and vegetables sales within the target areas, with an average increase of 143% in sales of fruits and vegetables for stores following all the programme guidelines and recommendations (e.g. setting up *ad hoc* stands for fruit and vegetables, using the programmes brand, increasing range quality and communication within store, etc.), and a more modest increase for participating stores that did not make significant changes to their layout, but still used the programme logo and provided some information regarding the benefits of healthy eating.

The evaluations must be seen as encouraging rather than conclusive. They are based on individual stores and short time periods; and they are potentially liable to self selection bias (the stores' new customers may be concerned consumers who previously made the effort to shop in supermarkets, so the increase in sales from these stores may not imply an increase in overall consumption). Furthermore, there is a lack of cost-effectiveness analysis of all interventions, which makes it difficult to assess the true value of the programmes. The interventions are at an initial phase and more research should follow to attain a more comprehensive evaluation. Capacci et al (2012) classify the evidence as suggestive rather than conclusive.

Evidence on cost effectiveness

None

Additional comments (including new literature)

In America, the Healthy Communities component of Michelle Obama's *Let's Move!* Campaign includes access to healthy food as one of four pillars in the effort to address childhood obesity. The Obama administration has proposed the Healthy Food Financing Initiative (HFFI) to find ways to bring affordable, nutritious food to areas of low access. The United States Department of Agriculture (2009) report "Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences." highlighted potential sources and consequences of the problem, and found, that 23.5 million people live in low-income areas that are further than 1 mile from a large grocery store or supermarket, and that 11.5 million of these people have low income themselves. 6,500 census tracts (typically tracts have between 1000 and 8000 people) met the specific conditions set for food deserts.

Bonanno et al (2012) use a game-theoretic approach which suggests that large food stores avoid areas with higher poverty. Zachary et al (2012, p5) estimated econometric models controlling for counterfactuals and countenance that availability measures themselves are unlikely to provide a solution, it is more important to address economic access (through programmes such as SNAP).

Public acceptance

In the survey this issue was not addressed.

Points put to stakeholders for discussion

Ensuring that all areas, deprived and rich alike, have adequate access to healthy food is fundamental to encouraging healthy eating. The effectiveness of parallel social marketing or educational campaigns will be seriously limited if people are unable to find healthy food alternatives within their neighbourhood. However, results of some pilot studies into improving healthy food availability in disadvantaged areas are encouraging.

- More trials should be established and they should incorporate well-conducted evaluations to provide the evidence base necessary for concrete recommendations in this area.

Stakeholder feedback

Feedback was mixed. There was support from consumer groups in Italy, policy makers in Poland and consumer and industry groups among EU stakeholders. However others did not believe food deserts exist in Europe and felt that there were higher priorities in ensuring physical access to fruit and vegetables to all consumers, for example through farmers' markets in Poland and motorway services in Denmark.

EATWELL response

This is evidently an important area for research in the US, prompted by the Obama administration and USDA. The evidence is building up to suggest food deserts do exist in America, but the reasons are complex and issues of economic access to healthy food may be as important as physical access. It seems unlikely, despite what some stakeholders say, that food deserts do not exist at all in Europe, but it is likely they exist to differing degrees in different countries and they may not be restricted to disadvantaged areas.

Final recommendations on availability measures for disadvantaged consumers

- Evidence on the existence and importance of food deserts in Europe where consumers are unable to access healthy food is inconclusive, though emerging research in the US suggests it may be an issue. We recommend more research into the existence of food deserts in European countries and the multi-faceted factors that influence outlet location and consumer demand in these areas.
- More trials should be established to improve access to healthy foods in areas where geographical access is considered problematic. These should incorporate well-conducted evaluations to provide the evidence base necessary for concrete recommendations in this area.

6.4. Food reformulation

EATWELL carried out a qualitative case-study of industry- Government collaboration to encourage food reformulation in Poland, UK, Denmark and the European Platform for Action on Diet, Physical Activity and Health, and mandatory reformulation to remove trans fats in Denmark. The information below reflects the main findings (see EATWELL Deliverable 2.2 and the EATWELL report on reformulation at www.eatwellproject.eu).

Background

Prepared and take-away foods can have high levels of ‘unhealthy’ nutrients such as salt, trans and saturated fats and sugar. To a large extent, consumers intake of nutrients in these foods is unknowing; as consumer demand for convenience food has grown, so intakes of these nutrients have reached beyond World Health Organisation recommended maximum levels. For example in the UK it is estimated that 75% of salt intake is from processed foods and average intake, at around 9g/capita/day, significantly exceeds the WHO recommended maximum of 5g.

Although nutrition labelling in principle enables informed choice for processed groceries, demands on consumers’ information processing capabilities are substantial (Mayer 2008), and for eating outside the home it is generally not possible to know the nutritional composition of a meal. One approach is regulation, as for example with the 2003 Danish legislation on artificial trans fatty acids which set a limit of 2% for the share of trans fats in the oil of processed foods. Switzerland, Austria and Iceland have more recently introduced legislation to limit artificial trans fats. Portugal legislated to set maximum salt levels in bread. An alternative approach, adopted to differing degrees by a number of Member States, with the UK at the forefront, has been for governments and industry to work together to agree voluntary targets for reduction of salt, trans and saturated fats. This approach has also been used by the EU Platform for Action on Diet, Physical Activity and Health with members making voluntary pledges to reduce levels of specified nutrients from specified foods. To a large extent its success depends upon firms’ wishes to promote Corporate Social Responsibility and avoid unhealthy publicity from consumer and health NGOs.

The limits to reformulation are established by consumer acceptance, food safety (e.g. salt is a preservative), technological challenges—trans and saturated fats, sugar and salt all play functional roles in foods—and, in a few cases, food regulation (e.g. the use of full fat milk is required in the production of certain cheeses) (see van Raaij et. al., 2008). Some research questions whether what replaces the substituted product is necessarily better for health (e.g. if saturated fats replace trans fats—see e.g. Ratnayake et. al., 2009; European Commission, 2010). Others have studied the impact of the

use of healthy eating logos as an incentive to reformulate, for example Pick the Tick in New Zealand to signal salt in food (Young and Swinburn, 2002) and the Choices label in the Netherlands (Ratnayake et. al., 2009). The former found that 33 tonnes of salt were removed from products in a year, the latter that hypothetically consuming only products qualifying for the Choices label would bring Dutch nutrient intakes in line with dietary recommendations. Both studies demonstrate the difficulty of separating labelling and reformulation policy as the use of a logo is a common reward as well as an incentive for reformulation (Caswell and Padberg, 1992; Caswell 1992). The counter-argument is that all food should be healthy and not all firms would try to obtain a logo.

The Choices study (Ratnayake et. al. 2009) may be interpreted as implying that the principal barrier to reformulation is consumer acceptance (of quality and price), not functional requirements, safety or regulation, since there already exist products that could be substituted for presently chosen foods (without a fundamental change in diet structure).

Compared to binding measures, voluntary agreements are argued to provide firms with greater flexibility, exploiting company expertise, reducing overall costs, stimulating innovation and furthering understanding and trust among stakeholders (Segerson and Miceli, 1997).

Evaluation of evidence on policy effectiveness

In Denmark, trans fat levels fell rapidly to below the legal limit, industry action in fact anticipating legislation. However, average intake levels are said to have fallen as far in the UK without formal legislation, though a study for the European Parliament found mandatory approaches to be more successful than voluntary ones (Krettek et al, 2008). Consumer groups have argued that high levels of trans fats are present in the UK in low quality foods targeted at poor consumers and in Poland it is claimed some foods have 10-12% trans fats and population intake levels are among the highest in Europe (Achremowicz and Korus, 2007). We find that voluntary reformulation has had some success with respect to salt; in the UK and at the EU level, many firms have made commitments and these have been acted upon and monitored. However, despite an impressive rate at which firms have signed up to make commitments to salt reduction, in the UK average intake has fallen by only around 10% to 8.6g (by 2008), still far in excess of the UK target of 6g and the WHO target of 5g.

Actions to reduce levels of saturated fats and sugar in foods are much less advanced.

SMEs may need assistance to meet the technological challenges of reformulation. They do this at present through links to research associations and, particularly in the case of own-label products, links to retailers, but such linkages are not well developed for firms in all Member States.

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

The UK Food Standards Agency (FSA) estimated that its one gram average salt intake reduction across the UK population yields an annual benefit of 56,660 Quality Adjusted Life Years (QALYs) per year. In the UK a QALY is valued at around €35,000, so this amounts to about €2b per year. Estimating reformulation costs is problematic. On the cost side of the equation, the FSA has argued that since reformulation is voluntary, it should be considered a commercial decision, therefore costs should not be counted in a social cost-benefit analysis. This is slightly disingenuous since the main reason for government involvement is to encourage companies to make decisions they would not have taken on a purely commercial basis. Nevertheless, even industry agrees that much reformulation has been undertaken as part of the normal new product development process, so it becomes impossible to disentangle costs purely associated with government pressure. Investments to reformulate can be substantial, for example Mars UK estimates saturated fat reduction cost in its chocolate bars at €10m (FDF 2009). PepsiCo's switch to healthier sunflower oil technology has meant a cumulative increase of oil costs of €55m between 2004 and 2008 (Pepsico 2010). An important part of the reduction in saturated fats has been achieved through switching oil sources or using blended oil products (Baking Management 2006).

Where product reformulation is mandatory (in response to regulation) the full industry cost of reformulation should be attributed to the policy. Even so, mandatory salt limits were deemed highly cost effective (Vos et al, 2010).

Additional comments (including new literature)

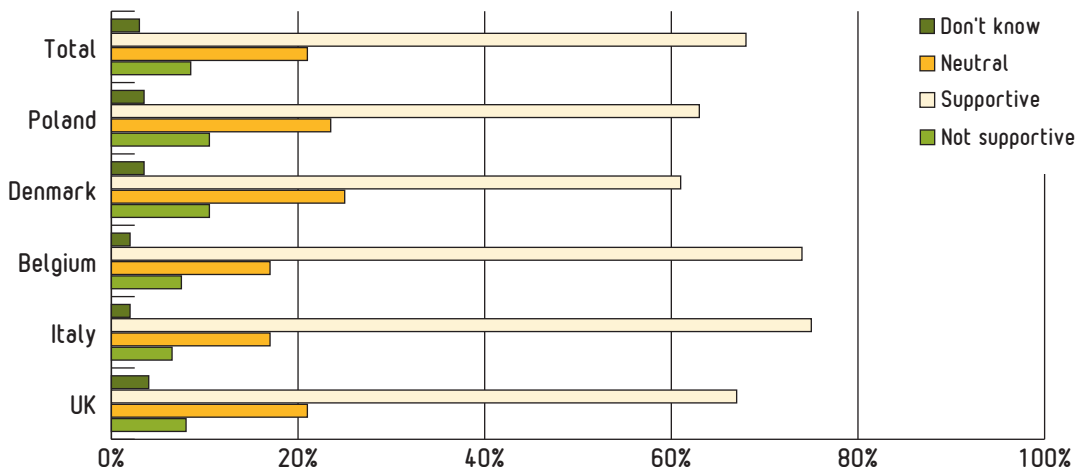
The European Heart Network Report (2011) in its recent major study puts considerable emphasis on reformulation. It proposes the EU continue with its voluntary approach with respect to levels of fat, sugar and salt and Member States do the same with firms in their countries, but that both EU and member States introduce legislation if voluntary progress is slow. They propose the EU legislate to set a maximum level of artificial trans fats.

Public acceptance

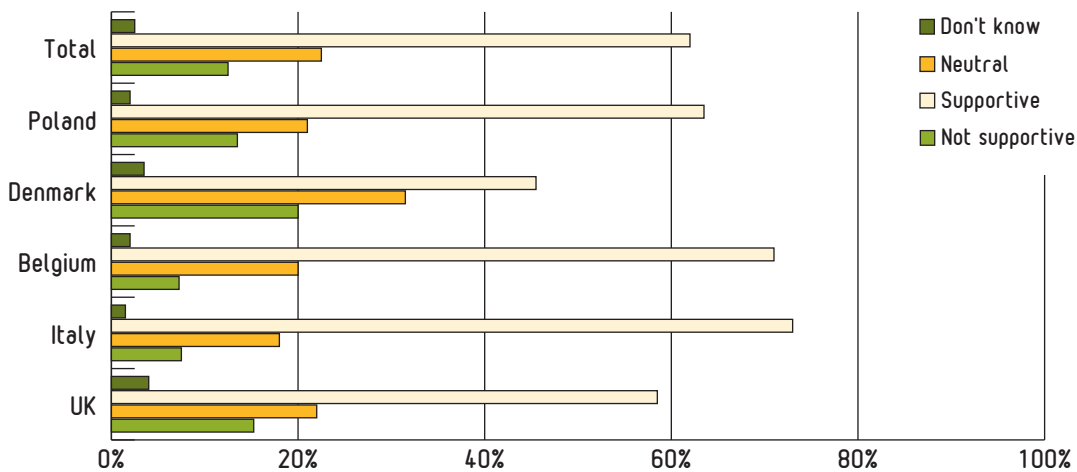
Survey participants were asked their degree of agreement (from 1 strongly disagree to 5 strongly agree) with two statements: “the government should work with the food companies to improve the nutritional content of processed foods (e.g. less salt or fats)” and “the government should impose on food companies limits on certain ingredients (e.g. salt or fats) to improve the nutritional content of processed foods”.

The imposition of nutrition standards has highest support in Italy (73%) and Belgium (71%) and is lowest in Denmark (45%). When considering industry-government co-operation, there is slightly more support in Italy (78%) and Belgium (74%), Poland is unchanged but support is significantly higher (now above 60%) in Denmark and the UK.

- › The government should work with the food companies to improve the nutritional content of processed foods (e.g. less salt or fat)



- › The government should impose on food companies limits on certain ingredients (e.g. salt or fats) to improve the nutritional content of processed foods.



Points put to stakeholders for discussion

- All Member States should enter into negotiations with the food manufacturing, catering and retail industries to develop voluntary agreements for salt and trans fat reformulation (in the first instance).
- We have insufficient information as to whether or not a logo for use by participating firms or trade associations improves participation rates and the share of produce reformulated. This deserves further investigation.
- Further investigation is needed into whether it is possible to devise a system that maintains the benefits of the voluntary system but creates a safety net to ensure against any foods containing too high levels of salt and trans fat and saturated fat. This would need to be undertaken at the European rather than Member State level to avoid contravening EU food law.

Stakeholder feedback

The first point concerning voluntary agreements was supported by policy makers and industry groups, but consumer groups saw this as an intermediate step towards mandatory standards or rejected it in favour of mandatory standards right away. Concerns were raised in Denmark about how voluntary standards would be policed/monitored and whether standards would be set high enough while the EU policy group felt agreements should cover nutrients other than salt and fat, including positive nutrients such as fiber/wholegrain, and should cover portion size. The EU industry group believe trans fat is no longer a public health issue in Europe.

On the subject of a logo the need for further research was widely accepted, including whether a logo encourages reformulation to spread through the market beyond the leading firms and how to avoid the logo being used as a pseudo health claim on products with high levels of fat, salt and sugar who have made marginal improvements through reformulation. The point was made that firms should not have to pay for use of any logo as this will act as a deterrent.

Whether a mandatory safety net was desirable brought differences of opinion. Generally supported by consumers, industry in particular believes standards for most nutrients are difficult to set because requirements vary by product category.

EATWELL response to stakeholders and new information

Given the variety of product categories, we do not accept that mandatory standards are feasible or desirable for all nutrients, but we accept the view of the European Heart Network that they are desirable for trans fats. This would eliminate our proposed recommendation for a safety net. There is a lot of support for logos, and some suggestion of acceptance and effectiveness, for example in Denmark, but we would not want to make a general recommendation in this direction.

Final recommendations on food reformulation

- Voluntary reformulation has been effective in reducing salt intake. All Member States should enter into negotiations with the food manufacturing, catering and retail industries to develop voluntary agreements for salt reduction and these agreements should be extended, as feasible, to include saturated fat and sugar and possibly portion size and positive nutrients such as whole grains.
- Most foods already meet artificial trans fats targets, but EU legislation should be introduced to set a maximum level in all foods.
- Further investigation is needed as to whether a logo for use by participating firms or trade associations in voluntary agreements improves participation rates and the share of produce reformulated.

6.5. Regulation of school meals

EATWELL carried out a case study on the 2005 French ban of vending machines from schools (Capacci, Mazzocchi, and Shankar, 2012), whose results are taken into account together with evidence collected from the literature on school and workplace interventions (Capacci *et al.*, 2012; Brambila-Macias *et al.*, 2011).

Background

Among the interventions aimed at changing the market environment, regulation of catered meals is the most common. The category includes regulation of food provision in all public sector establishments, but measures concerning schools are by far the most widely applied.

In most developed countries food offered in schools consists of free or subsidised meals provided by the school catering service and it is often complemented by kiosk and vending machines. Concerns for growing childhood obesity rates have led health authorities to increasingly direct their attention to the school environment as a useful path to reach and affect pupils' nutritional practices; school meal interventions are evenly distributed between Nordic and Mediterranean countries.

The basic form of meal regulation consists of providing school catering services with guidelines and standards for school meals in order to improve their nutritional quality. Yet, one of the most frequent measures affecting school environments all over Europe is the provision of free or subsidised healthy snacks, mainly fruit. For example fruit provision in schools is often part of nationwide fruit promotion campaigns (e.g. 5-a-day programs), and in general interventions affecting school meals occur in association with nutrition education programmes aimed at making pupils aware of the importance of healthy eating habits. Since 2009 European national authorities are supported by the EU School Fruit Scheme, and distribution of free fruit and vegetables to school children is co-financed by the European Commission.

A major recent trend in Europe concerns the regulation of vending machines, which are very common in secondary schools. In some cases there have been regulatory initiatives (but mainly at the piloting stage) which substitute unhealthy with fresh and healthy snacks to be sold by vending machines. Alternatively vending machines are completely banned in schools; this is the case in the UK and in France.

Outside Europe, since 2003 most US states have introduced regulations concerning vending machines in school (in 2000 98.2% of senior high schools had either a vending machine or a snack bar where students could purchase competitive foods or beverages). In Japan school meals have been subject to food standards since 1954, with strict limits on fats and a ban on vending machines.

Evaluation of evidence on policy effectiveness

As indicated in our *Nutrition Reviews* article (Capacci *et al.*, 2012) most of these actions show a positive effect on behaviour, at least in the short term. The introduction of vending machines for fruit, vegetables and yoghurt in some Italian schools induced an increase of healthy snacks consumption of 21% in the first year, while provision of new healthy menus in Scotland caused an increase of healthy food intake by pupils of 35%. However, most of the evaluations are extremely partial in nature, recording only changes in behaviour at the place of intervention (e.g., sales from vending machines at schools); hence, they fail to take into consideration any compensating behaviour outside the school.

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

No clear evidence exists. A rigorous review of evidence on the benefit side is provided in Jaime and Lock, 2009, who highlight the lack of assessment on the cost side.

Additional comments (including new literature)

As discussed, most evaluations are limited in scope; they focus on intention to consume, or self-reported consumption. Even when actual changes in consumption at the place of intervention are measured, most evaluations ignore compensating behaviour outside schools. An exception is the evaluation of the School Fruit & Vegetable Scheme in England (National Foundation for Educational Research), where fruit and vegetable intakes (and dietary takes in general) were recorded at school and at home over 24 hours, with follow-ups after the end of the scheme. This evaluation found that significant increases in F&V intakes during the scheme implementation had no effect on the overall diet, and were not sustained after the scheme. Similarly, the EATWELL case study on the French vending machine ban in 2005 (Capacci, Mazzocchi and Shankar, 2012) did provide some evidence of a significant improvement of diet and lower calorie intakes at school, especially if the focus was limited to the morning break, but a much smaller effect on the overall daily intakes, arguably due to compensation effects.

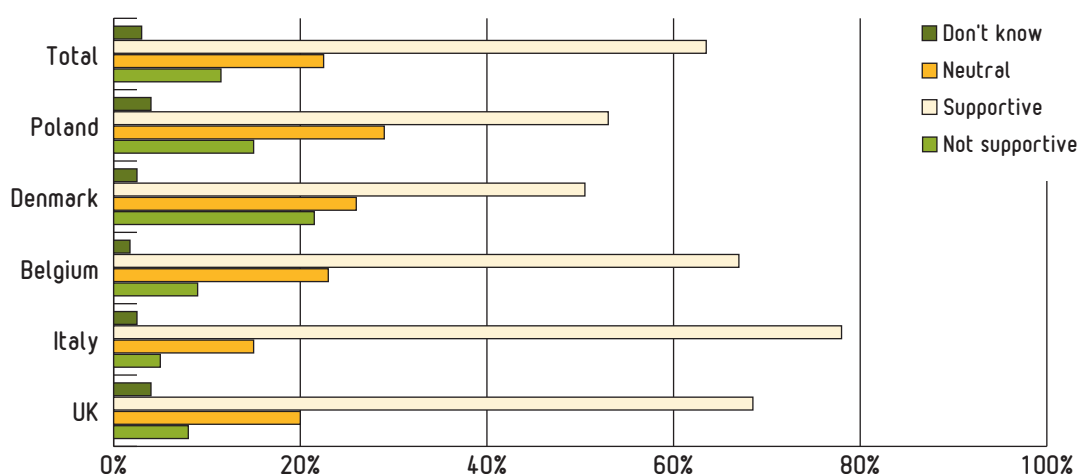
Thus the correct evaluation strategy should make use of data measuring actual consumption or nutrition intakes covering a reasonable period of time (one or two weeks) and all the possible eating occasions (in and outside schools). These data account for any compensating behaviour which can take place outside schools. Collecting such information is normally quite expensive and complete consumption or nutritional data for all individuals would need to be recorded in national surveys.

Finally, even when immediate compensating behaviour is accounted for, long term effects of regulations should be assessed following students behaviour over time, in order to evaluate the persistency of diet change.

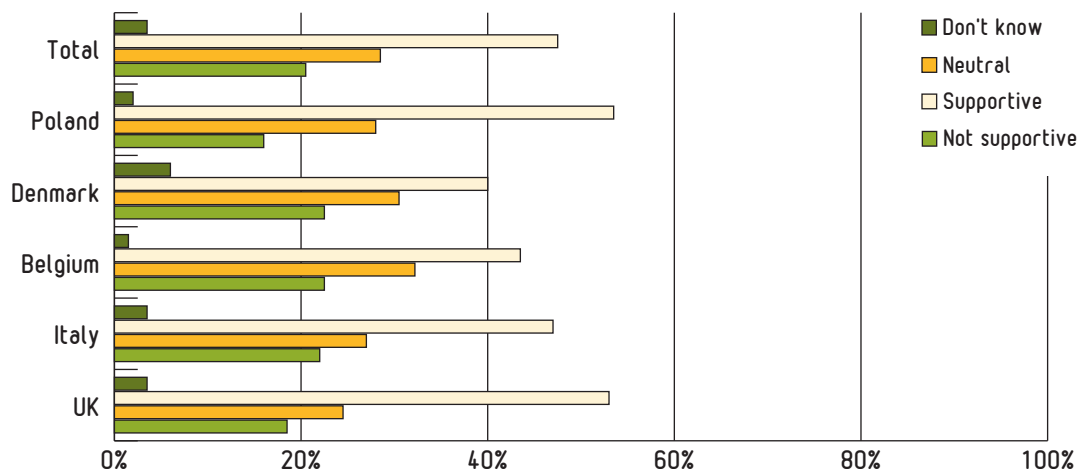
Public acceptance

Two types of measures are considered, guidelines/standards for school meals and the ban of vending machines in schools. The former received support of 63.3% of respondents, ranging from 50.5% in Denmark to 78% in Italy, while the latter is one of the least supported policies, with 47.5% of respondents in favour. Compared to other policies, the regulation of school meals ranks quite high in the UK (68.5% of supportive respondents, 4th in the ranking).

› The government should regulate the nutritional content of school meals



> Vending machines should be banned from our schools



Points put to stakeholders for discussion

Given the significant role schools play in childhood nutrition in advanced countries, schools should not be providing unhealthy diets and school meal regulations are justified.

- Measures regulating food provision in schools are recommended, but they should be accompanied by education measures to enhance their long-term effectiveness.
- Regulation of snack food supplies from vending machines in schools is recommended, but this should ensure machines supply healthier foods rather than imposing an absolute ban on vending machines.

Stakeholder feedback

Almost all groups agreed that school meals should be regulated. School canteens may play a very significant role in appropriate nutrition and educational activities which should also raise motivation, must start appropriately early (nurseries, kindergartens), targeting parents at the same time.. Educational measures, moreover, should be conceived not only for the pupils but for the teachers as well. Concerns included defining exactly what 'healthy' means. One point that was raised was how the project can recommend regulating school meals and at the same time discourage increased nutrition education in schools. These two are contradictory.

Most of the stakeholders agreed that vending machines should not be removed, but vending machine products should offer any food consistent with nutrition recommendations for children and adolescents (not limited only to fruit and vegetables). Consumers turned attention to the fact that "healthy" food should be at competitive and controlled price.

EATWELL response to stakeholders and new information

Our initial recommendations received good support from all types of stakeholders, so they may be confirmed.

Final recommendations on regulation of school meals

- Measures regulating food provision in schools are cost effective and recommended, but they should be accompanied by education measures to enhance their long-term effectiveness.
- Regulation of snack food supplies from vending machines in schools is recommended, but machines should supply healthier food choices rather than imposing an absolute ban on vending machines.

6.6. Regulation of workplace meals

There has been no direct EATWELL evaluation for this type of measure, so recommendations are based on the literature, including the EATWELL review in Brambila-Macias *et al.* (2011)

Background

Few countries have introduced measures targeted at workplace catered food. In Europe, the Finnish government requires providing healthy meals in workplace catering, while Denmark has enforced a pilot component of the 6-a-day programme in a number of selected workplaces. Outside Europe, in Canada, a system of certification for those canteens meeting the required standards for healthy eating is in place.

Evaluation of evidence on policy effectiveness

Sassi *et al.* (2009) found evidence that workplace interventions (e.g., group sessions with a nutritionist every 2 weeks for 20 months reinforced by health-related activities and catering services offering healthy food) increase consumption of fruit and vegetables as well as physical activity, with corresponding decreases in fat intakes. Furthermore, those who were exposed to workplace interventions seemed to retain some of the benefits after retirement. Mazzocchi *et al.* highlighted that the Government of Finland has influenced diets by providing healthy meals in the workplace; guidelines have been in place since the 1970s and are said to be closely followed, particularly in the public sector. Indeed, those who eat at staff canteens are said to eat more vegetables, fish, and boiled potatoes”.

Evidence on cost effectiveness (from EATWELL Deliverable D2.3)

There are no specific studies evaluating the cost-effectiveness of interventions in workplace canteens, although a WHO review (Proper and Van Mechelen 2008) considering a broader set of workplace interventions targeted at diets and physical activity estimated that this type of intervention could reduce total direct healthcare costs by 0.4% and indirect costs (e.g. absenteeism) by 0.5%.

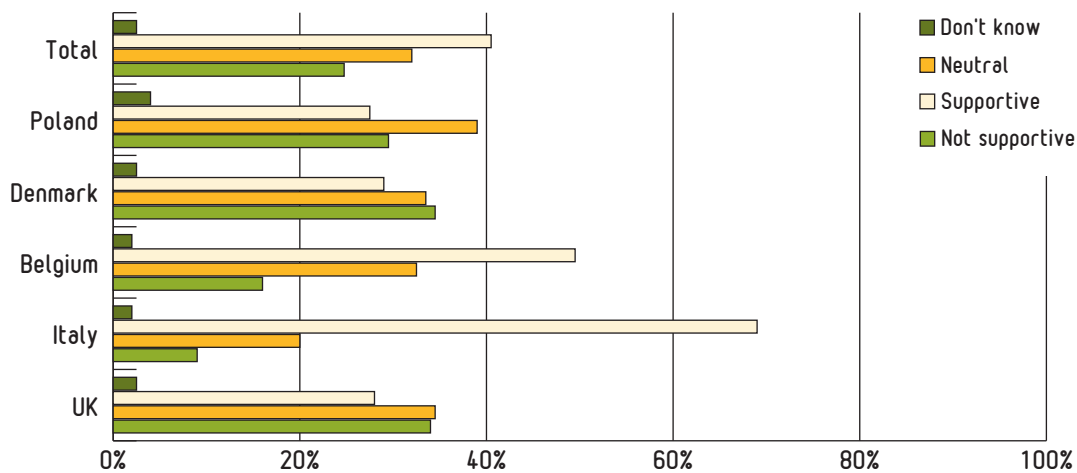
Additional comments (including new literature)

Initiatives to promote healthy eating in workplaces have been in place for some time in Scandinavian countries, especially Finland (Jørgensen *et al.*, 2010; Pietinen *et al.* 2010), although the collected evidence base is still limited. In principle such regulations may affect workers' intakes for those meals consumed at workplaces, similarly to school meal regulations, but as for students, impact assessment should account for compensating behaviour outside the workplace, and for long term persistency of eventual behavioural changes.

Public acceptance

Government regulation of workplace meals is the least accepted policy among those considered in the EATWELL survey. The percentage of respondents supporting such measures is 40.6%, though there is a striking difference across countries, especially Italy (69%) and Belgium (49%), while UK, Denmark and Poland countries are around 28-29%.

› The government should regulate the nutritional content of workplace meals



Points put to stakeholders for discussion

Few countries have introduced measures targeted at workplace catered food and this is by far the least accepted policy among those considered in the EATWELL survey.

- The introduction of regulations limiting choice in the workplace is not recommended, as it is probably ineffective and very unpopular.
- There are alternative workplace measures for which there is suggestive evidence of success and acceptance, like subsidised healthy options in workplace meals (existing in Finland since the 1970s and more recently in other Scandinavian countries). These measures expand rather than restrict choice and can be recommended and further explored like public sector work places in the first instance, perhaps later extending to the private sector.

Stakeholder feedback

Most stakeholders agreed that it is important not to restrict choices but to expand them, not only in work places but also in university canteens. Work place canteens should offer a wide array of choices together with information on a balanced meal. Some participants stressed that voluntary measures and the use of any possibilities to promote healthy choices (e.g. through ‘nudging’) should be promoted.

On the other hand some stakeholders claim that some experience indicates that employees in fact highly accept interventions for healthier food and eating; the low acceptance might be due to the way the question was worded in the survey. Wording this environmental change as “limiting choice” is unlikely to be popular. There are strategies which could help popularise improvement of workplace meals, for example, by slowly introducing menu changes and by making the healthier choices attractive. According to some participants there is no evidence to suggest these actions are ineffective. They recognised their importance as part of a whole-workplace approach to healthy behaviour.

There were more mixed responses to the point concerning subsidising canteen meals. The comments concerned widening the choice of healthy meals to which all stakeholders agreed. According to some participants if it is not possible to avoid unhealthy food it is necessary to reduce their servings.

In general, the recommendation to avoid strict regulations and choice-limiting measures in the workplace received support from all groups, and so did the recommendation to expand choice. However, some reservations exist about public subsidies to enhance healthy choices in workplace canteens. Another strong suggestion was to accompany the widening of choices with adequate information and possibly workplace education measures. The lack of evidence on the effectiveness of workplace canteen interventions was also emphasised.

EATWELL response to stakeholders and new information

Dialogue with stakeholders has reinforced our recommendation towards avoiding choice-restricting workplace interventions, but considering and collecting more evidence on choice-enhancing workplace interventions.

Final recommendations on regulation of workplace meals

- There is suggestive evidence of success and acceptance of workplace measures which expand rather than restrict choice. These can be recommended and further explored in public sector work places in the first instance, perhaps later extending to the private sector. Convincing evidence on the cost-effectiveness of these interventions should be gathered.

CHAPTER 7



7. OVERALL SUMMARY AND CONCLUSIONS

The EATWELL project has gathered together information on nutrition policy interventions in EU Member States and grouped them according to a simple classification scheme into five measures designed to educate and inform and six more interventionist measures designed to change the market environment by influencing prices or availability. We have studied evaluations of these interventions carried out by Member States and in the academic literature and have performed further evaluations within the project. According to criteria we establish for sound policy evaluation, very few evaluations meet the grade. After summarising the evidence for each individual policy type in this document, the most common recommendation we make is for more and better evidence to be collected.

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