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Executive summary

The EATWELL research project was launched in April 2009 and completed in March 2013. 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
- Undertaken fresh quantitative analysis of national-level datasets to assess the impact of interventions on consumers’ behaviour
- 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 private sector in the promotion of healthy eating
- Assessed public, private and other stakeholder acceptance of alternative forms of intervention through surveys and workshops.

111 Member State nutrition policies were classified 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. Existing policy evaluations were assessed and further analysis of secondary data sets used modern statistical techniques to improve the evidence-base and develop and demonstrate sound evaluation principles.

In general, information measures have a small but positive effect on healthy eating and, because they are relatively cheap, they are generally cost-effective 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 cost effective. However the measures are more intrusive than information interventions and therefore generally less well accepted by the public.

According to criteria we establish for sound policy evaluation, very few evaluations meet the grade. However there is sufficient evidence for the recommendations we make. Although the evidence base is incomplete, it is sufficient to justify intervention, even including measures which change the market environment such as fat taxes or, especially, measures targeted at subsidizing healthy eating in low-income families.

Priorities to improve the evidence base are: 1) better data which follow the same consumers over time or at least ask the same questions over time; 2) ensuring data are better harmonised across the EU; and 3) gaining a better understanding of the cognitive processes which lead informed consumers to make unhealthy choices.
27 case studies of successful commercial food marketing identified key success factors that could be transferred to the public sector: strengthening research in public environments and current consumer trends, such as ‘naturalness’; increasing citizen participation; decreasing barriers to and expanding public-private partnerships; stressing short-term benefits of healthy behaviour such as good taste and wellness; and strengthening public campaigns by adding a stronger emotional appeal and linking with common values.

Over 3,000 online interviews were carried out in Italy, UK, Belgium, Denmark and Poland to investigate public acceptance of existing or new nutrition policy interventions. Support for all policies outweighed opposition, usually by a significant margin; education in schools and labelling are the most supported policies in Europe; regulation of workplace meals, bans of advertising to adults and banning vending machines in schools are the least supported measures; acceptance rates were broadly similar across countries.
1. A summary description of project context and objectives

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; additionally overconsumption of salt, sugar and saturated fats and under-consumption of fruit and vegetables cause almost 70,000 premature deaths annually in the UK alone. 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. They have initiated a variety of policy interventions to encourage healthy eating, including prohibitions on advertising certain foods to children, promotion of fruit and vegetable consumption, nutrition labelling, dialogue with food industry to improve food product composition and regulation of school meals and public sector canteens to ensure healthy food offerings. 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. Specifically, the project’s objectives have been:

(1) Assessment of the efficacy of past interventions in improving dietary and health outcomes, and identification of promising avenues for the future
(2) Assessment of the acceptability of potential future interventions and generation of best-practice guidelines for implementation.
(3) Provision of policy, data collection and monitoring advice in relation to healthy eating.
(4) Management of project to optimise scientific output and communication of scientific findings to a wide audience

To this end the EATWELL project has gathered benchmark data on healthy eating interventions in Member States and reviewed existing evaluations of the effectiveness of interventions. EATWELL further gathered secondary data and analysed them using models mainly from the psychology and economics disciplines. The aims were two-fold: to strengthen the evidence base and to develop and demonstrate appropriate evaluation methods.
A further component of the project analysed lessons that can be learned from the private sector that are transferable to healthy eating campaigns in the public sector. Through consumer surveys and workshops with stakeholders, EATWELL assessed the acceptability of the range of potential nutrition policies. Armed with scientific quantitative evaluations of policy interventions and their acceptability to stakeholders, EATWELL recommended most appropriate interventions for Member States and the EU, provided a one-stop guide to methods and measures in evaluation, and outlined data collection priorities for the future.

EATWELL’s strategy to meet these objectives was to review the current state of the art, identify gaps and define an evaluation framework and the precise scope of further work. Then a series of work packages executed the primary and secondary analysis at the core of the work. Subsequently all the work was brought together and synthesised to generate policy, methodology and data collection recommendations. Dissemination and management activities were undertaken throughout the project.

The overall structure of the work plan is depicted in Figure 1 below. The project consisted of 7 work packages. WP1 provided a foundation and review of available information, directly addressing the benchmarking objective of the project. Work packages 2 to 4, the main fundamental research packages, employed a variety of research methods such as econometric and qualitative analysis, a consumer survey and stakeholder workshops. These work packages together addressed the project objectives relating to improvement of the evidence base for the effectiveness of policy interventions for healthy eating and their acceptance by consumers and other stakeholders. Additionally, WP3 explicitly fulfilled the project objective of enabling learning from private sector marketing initiatives.

WP5 drew together the evidence from the previous work packages to provide guidance for the future. Such guidance enable fulfilment of project objectives relating to policy recommendations, reporting on optimal methods and measures to use in intervention analysis, and indicating data collection priorities for the future. WP6 dealt with stakeholder involvement, dissemination and exploitation and WP7 with management.
Graphical presentation of the components and their interdependencies

The sections below describe the research within Workpackages 1 to 5.
2. Description of the main S&T results

2.1 Workpackage 1: Benchmarking nutrition policies in Europe, their evaluation and identification of successes and failures

Policy interventions aiming at healthy eating that influence food intake have developed in piecemeal fashion in the European Union (EU), its Member States and elsewhere but they have seldom been formally evaluated. The objectives of WP1 were to develop a framework for the evaluation of policy interventions targeted at improving healthy eating, to identify, classify and to map relevant interventions and their timing, to review the existing evidence concerning their efficacy and effectiveness (including cost effectiveness and cost-utility analysis) and to identify databases that would permit more complete and formal evaluation in the next steps of the EATWELL project.

Healthy eating was defined as adherence to the nutrition recommendations of the World Health Organization (WHO) and the maintenance of normal weight (body mass index between 20 and 25 kg/m²). The project focused on policy interventions undertaken at the level of EU Member States or large regions, not the multitude of community-level measures taken within doctor’s surgeries and community organisations, for example. Therefore, policy intervention referred to any governmental action that could affect people's healthy eating behaviour by supporting more informed choice and/or by changing the market environment for food.

A total of 111 policy interventions were identified in Europe based on scientific papers, policy documents, grey literature, government websites, other policy reviews, and interviews with policy-makers. Policy interventions were classified into two broad categories: measures to enable informed choice through the provision or control of information flows and education; and market intervention measures that directly influence food availability and/or prices. A large majority (around two thirds) of the identified policies were information measures, notably nutrition education in schools, public information campaigns and, to a more limited extent, advertising controls and nutritional labelling. The most common market intervention (around one third) measures were regulation of the nutritional composition of school meals, followed by governmental actions to encourage the private sector to improve diets, notably through reformulation of processed foods. Less common were the use of fiscal incentives, the establishment of nutrition-related standards, measures to improve healthy food availability for disadvantaged consumers and liability laws. A third category (representing less than 1%) was created for measures not specifically targeted at healthy eating but inadvertently influencing diets and dietary choice, along with general (generic) measures that are overarching.

Table 1 summarizes the preliminary evidence with respect to policy evaluation collected for each type of policy intervention. The evidence is further assessed and refined in WP5 where recommendations to Member States are made. Besides showing to what extent each policy type has been adopted in Europe and what the most frequent gaps were in existing policy evaluations, it also shows where the body of evidence could be regarded as suggestive of a positive impact. For those policy actions whose evaluations provided conflicting evidence on their effectiveness, a mixed classification was assigned.

While many policy actions have been accompanied by some quantitative evaluation of their effectiveness, in most cases these evaluations were limited to changes in attitudes, which do not necessarily translate into healthier eating, improved nutritional status or more favourable health markers. The actual behavioural responses have rarely been monitored for a period long enough to establish lasting success or failure of the interventions. Even if comprehensive simulation studies
existed, these were often based on fragmented evidence and inadequate data. These findings suggested a need for studies which provide a systematic assessment of different types of intervention, where the policy outcome is evaluated in a longer time frame and in relation to a counter-factual benchmark.

**Table 1. Healthy eating policies in Europe and their basis of evidence**

<table>
<thead>
<tr>
<th>Policy instrument</th>
<th>Adoption in Europe</th>
<th>Most frequent gaps in policy evaluation</th>
<th>Reported evidence of positive impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interventions supporting more informed choice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising regulation</td>
<td>Extensive (for children), very limited for the population at large</td>
<td>Inappropriate outcome variables (focus on exposure/awareness)</td>
<td>Suggestive (strong evidence on awareness/attitudes, uncertainty about behaviours, especially long-term)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriate measurement (self-reported)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No counterfactual consideration</td>
<td></td>
</tr>
<tr>
<td>Public information campaign</td>
<td>Extensive</td>
<td>No counterfactual consideration</td>
<td>Suggestive (strong evidence on awareness/attitudes, small impact on behaviours)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriate outcome variables (awareness and attitudes, no long-term assessment)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriate measurement (self-reported intentions)</td>
<td></td>
</tr>
<tr>
<td>Nutrition labelling</td>
<td>Extensive</td>
<td>Self-selection bias ignored</td>
<td>Mixed (strong evidence on awareness for users, mixed results on the dietary outcomes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriate measurement (self-reported)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>In appropriate outcome variables (label use/acceptance, no diet/health outcome)</td>
<td></td>
</tr>
<tr>
<td>Nutrition education</td>
<td>Extensive (but on a small scale)</td>
<td>No counterfactual consideration</td>
<td>Suggestive (uncertainty about larger-scale outcomes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriate outcome variables (awareness and attitudes/no long-term assessment)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inappropriate measurement (self-reported intentions)</td>
<td></td>
</tr>
<tr>
<td>Nutrition information on menus</td>
<td>None (only local experiments)</td>
<td>No policy evaluations; academic experimental studies exist</td>
<td>Suggestive</td>
</tr>
</tbody>
</table>

| **Interventions changing the market environment** | | | |
| Fiscal measures: taxes | None (some pilot initiatives) | No policy evaluations; many academic simulation studies exist | Mixed (uncertainty about distributional impacts) |
| Fiscal measures: subsidies | Limited | No quantitative evaluations; academic studies for the USA exist | Suggestive |
| Regulation of meals in schools/workplace | Extensive (for schools), very limited for workplaces | Inappropriate outcome variables (individual foods, no overall dietary behaviours) | Suggestive |
| | | Inappropriate measurement (no compensatory behaviours and medium-term effects) | |
| | | Selection-bias ignored | |
Finally, there were a few actions that are rising on the European policy agenda, but currently lack rigorous evaluations. Product reformulation - through either regulation of food standards or voluntary industry measures - is potentially effective in reducing excess intakes of unhealthy ingredients and nutrients (e.g. salt, trans-fats), especially when most of the intake derives from the consumption of processed foods.

The current evidence base on the effectiveness of healthy eating policies was scarce, because of insufficient data and improper evaluation methods. A progress in evaluating policy effectiveness can only be achieved if the following priorities are met: (1) ensure the availability of adequate data, which should reflect the appropriate outcomes (relevant intakes and health markers) and cover an appropriate time window to capture at least medium-term effects; (2) adopt evaluation methods which isolate confounding factors, through a correct evaluation of the counter-factual scenario, and accounting for any self-selection bias in the study participants; and (3) consider distributional effects to capture causal links and identify social inequalities. These criteria were also further refined in WP5.

The activities of WP1 were concentrated in the first two years of the EATWELL project. The activities during the first year focused on identifying and reviewing relevant policy interventions as reported in the project deliverables for WP1. Activities during the second year (and to a small extent during the beginning of the third year) concerned the drafting and follow-up of three scientific journal papers based on the insights obtained in WP1. (Brambila-Macias et al., 2011, Capacci et al., 2012 and Perez-Cueto et al., 2012).

References


### 2.2 Workpackage 2: Review and Quantitative Evaluation of the Effectiveness of Interventions

WP2 aimed to improve the evidence base on the effectiveness of policies by undertaking rigorous policy evaluation for a set of policy cases. The specific objectives were to:

1. Use available secondary datasets in creative ways to provide added value through fresh evaluation of interventions.
2. Illustrate state-of-the-art methodologies for healthy eating policy evaluation and methodological lessons learnt from these applications.
3. Update conclusions from WP1 about what interventions work and what ones don’t.

Depending on data availability, the evaluations covered: (a) impacts on attitudes/knowledge/norms, (b) impacts on consumption/intakes and (c) cost-effectiveness and cost-utility analysis. We summarise major outputs and findings under these categories.

#### Case studies on attitudes/knowledge/norms

This segment of the workpackage carried out secondary analysis of UK’s Consumer Attitudes Survey (CAS) and the Public Attitudes towards Food Issues (PAFI) datasets, which provide information on attitudes, knowledge and behavioural intentions. It includes a case study of attitudinal changes in Poland and Spain, again using secondary analysis of data collected in Poland and Spain from the EU funded SEAFOODplus project, and finally a revision of the recent attitudinal publications by EUROBAROMETER that focus on values and social norms.

From the CAS dataset, 40% of the pooled sample reported having eaten at least 5 portions of fruits and vegetables the day before, the time trend observed reveals that every year the consumption of fruits and vegetable would increase by 0.32 units. Regarding knowledge about five-a-day, 69% of all respondents know that people should eat at least 5 portions, this value being inversely related to household size. The increase in the number reported of portions eaten the day before starting from year 2004 after the launching of the five-a-day campaign, suggests that this increase could be attributable to the campaign. However, the nature of the data does not enable confirmation of causality.

From the PAFI data, women were 1.8 times more likely than men (P<0.001) to express their willingness to make at least one change to their diet in the forthcoming 6 months. A social gradient
was also observed, where respondents in (the middle to lower) social classes C2, D and E were respectively 52%, 46% and 42% less likely to express their intention to make any dietary change than respondents in class A. Eating more fruit and vegetables (31%) and drinking more water (26%) were the most common changes people would like to make to their diet.

Based on the SEAFOODplus consumer survey data, a more positive attitude towards fish, and increased levels of knowledge about seafood were observed in 2008 compared to 2004. This evolution could partially be attributed to national policy efforts aimed at stimulating seafood consumption in Poland. In Spain, objective knowledge about seafood increased and more people reported choosing fish when eating out in 2008 compared with 2004. Such a trend suggests that people slowly moved towards healthier choices even in the out of home eating.

In 1994, the majority of Italians (54%) reported a reduction in salt consumption, while in 2005-2010 this percentage rose up to 65%. Regarding the consumption of iodised salt, almost 10% increase was reported between 2005 and 2010.

From EUROBAROMETER publications, the main observation is that Europeans associate food and eating with pleasure and social enjoyment (values). The European Values Study (EVS) was consulted, but there were no relevant variables regarding healthy eating or that could be associated to any specific healthy eating campaign. The survey constitutes however an interesting source for future studies.

Overall, attitudinal data in Europe is scarce, particularly for the investigation of time trends. The best longitudinal data available was the UK CAS dataset. Future policy impact evaluations should include attitudinal data and be designed to identify changes over time.

Case studies on consumption/intakes

A major conclusion of WP1 was that there is a significant paucity of rigorous evaluations of healthy eating policies, and therefore the evidence base on the efficacy of dietary policymaking in Europe is very thin. The series of empirical case studies on consumption/intake analysed in WP2 has provided an opportunity to redress this lack. For the first time, several flagship healthy eating policies, such as the salt campaign in the UK and the vending machine ban in schools in France, have been subject by EATWELL to rigorous evaluation. There have been partial evaluations of such policies before, but they have typically been based on indicators several steps removed from actual behavioural change, and typically the analysis has also been simplistic. For example, past evaluation of the UK salt campaign has been restricted to analysing the percentage of people reporting awareness of the advertising campaign and reporting themselves to be influenced by it and/or by attributing all changes in salt consumption to the campaign. In contrast, the majority of WP2 consumption/intake case studies have been based on actual consumption data and a variety of modern impact evaluation methods have been tested and used, including pseudo-panel estimation, difference-in-difference methods, propensity score matching and demand models with counterfactual simulations. In addition, qualitative methods and methods for analysis of attitudinal data have been used where such methods have been more appropriate for the situation and available data.

We present short summaries of each study below:

Five-a-day social marketing in the UK.
This study conducted an ex-post assessment of the UK 5-a-day information campaign, where the positive effects of information were disentangled from potentially conflicting price dynamics. Using
4 years of data from the Expenditure and Food Survey between 2002 and 2006, the study estimated that the 5-a-day program had lifted fruit and vegetable consumption by 0.3 portions, on average. It also provided quantitative evidence of a differentiated impact by income group, ranging from 0.2 to 0.7 portions. All impacts were found to be larger than those observed by simply comparing pre-policy and post-policy intakes.

**Five-a-day social marketing in Spain, Denmark and the UK**
A separate study to examine the effects of public information campaigns promoting fruit and vegetable consumption was carried out using a common methodology to provide a comparative perspective across three countries, Denmark, Spain and the UK. In Denmark, the policy was introduced in 2000, in Spain in 2004, and in the UK in 2003. Pseudo-panel data methods were applied to national food budget datasets with data from multiple years before and after the policy, grouping household sharing key characteristics together and conducting the analysis on group means. These methods mimic panel datasets by following the same groups over a period of time, allowing for control of pre-existing time-trends and other panel data features. In Spain, a policy effect that increased fruit consumption by 0.44 portions per capita per day was found, while the vegetable consumption change was statistically insignificant. The Danish policy effects were statistically insignificant, though in the case there were data deficiencies that may have impacted the results. In the UK, the policy was estimated to have induced an increase of 0.12 and 0.11 portions/capita/day of fruits and vegetables respectively. The UK results using pseudo-panel methods produced comparable estimates to those noted in the previous paragraph using a different method, and thus bolster confidence in those results.

**Salt social marketing and reformulation campaign, UK.**
The UK Food Standards Agency initiated a campaign at the end of 2004 to reduce salt intake in the population. There is disagreement in the scientific and policy community over whether the campaign was effective in curbing salt intake or not. This study provided fresh evidence on the impact of the campaign, by using data on spot urinary sodium readings and socio-demographic variables from the Health Survey for England over 2003–2007 and combining it with food price information from the Expenditure and Food Survey. Aggregating the data into a pseudo-panel, the study estimated fixed effects models to examine the trend in salt intake over the period and to deduce the heterogeneous effects of the policy on the intake of socio-demographic groups. The results were consistent with a previous hypothesis that the campaign reduced salt intakes by approximately 10%. The impact was shown to be stronger among women than among men. Older cohorts of men showed a larger response to the salt campaign compared to younger cohorts, while among women, younger cohorts responded more strongly than older cohorts.

**Vending machine restrictions in schools, France**
This study estimated the effects of the 2005 ban on vending machines in French schools using the 1998 and 2006 INCA nutrition surveys. These surveys contained no information on the presence of vending machines in schools attended by respondents, but the adoption of a Difference-in-Difference design, and a Regression Discontinuity Design enabled us to obtain indirect estimates of the policy impact. Results were consistent across methods and suggested that the measure has had a small but statistically significant impact on teenager nutrition, especially in terms of reduced fat intakes.

**Advertising restriction on unhealthy food sold to children, UK.**
In late 2006, a new regulation restricting advertising of HFSS (High in Fats, Salt and Sugar) foods to children was introduced in the UK, with foods categorised as HFSS or not based upon a nutrient profiling model developed by the Food Standards Agency. We evaluated the consumption effects of
policy introduction using Expenditure and Food Survey (EFS) data from before (2002-06) and after (2007-09) policy introduction. Our evaluation of the OFCOM policy followed a difference-in-difference strategy. The strategy was built upon the assumption that a policy restricting HFSS food advertisement during children’s airtime and on children’s channels is unlikely to have any effect on HFSS food expenditure of families without children. Our results showed that no policy effect can be discerned, i.e. the regulation has not had a significant impact on HFSS food expenditures in affected household

Qualitative study of reformulation based on industry and policymaker interviews: Poland, Denmark, Italy, UK, and European Platform

Many prepared and take-away foods contain high levels of ‘unhealthy’ nutrients such as salt, trans and saturated fats and sugar. As diets have developed to include higher proportions of these products, consumers intakes have grown beyond World Health Organisation recommended maximum levels. Countries have responded by regulatory action (Denmark’s banning of trans fats) or collaborative (voluntary) measures with industry. This study undertook case study research in Denmark, the UK, Italy and Poland and at the EU level to address the research questions: Have reformulation actions been effective and cost-effective? Is collaborative action between government and industry more likely to be effective than industry acting alone? Are there circumstances under which legislation is preferable to voluntary action? Are there benefits to European as opposed to separate Member State action? What are the implications for competition? We found that voluntary reformulation has worked with respect to trans fats and salt. In the UK and at the EU level, firms have made commitments and these have been monitored and acted upon with substantial reductions in levels of salt and trans fats in their products. Manufacturers and retailers (in collaboration with their own-label suppliers) have done this largely for reasons of corporate social responsibility—it is good for their image to be seen to be conforming and it means they can’t (so easily) be held up by NGOs and the media as behaving irresponsibly. 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, still far in excess of the 6g target. Also not known is the extent to which the voluntary approach leaves high levels of harmful nutrients in foods produced by some companies, perhaps targeted to specific markets. 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. NGOs and some policy makers believe mandatory standards are the best way to make sure all food is ‘good’ food. 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 deserves further exploration. If so, this would probably need to be undertaken at the European rather than Member State level to avoid contravening EU food law. SMEs may need assistance to meet the technological challenges of reformulation. They do this at present through links to research associations and retailers, but such linkages are not well developed for firms in all Member States.

Cost-effectiveness and cost-utility analysis

The aim of this activity was to look at the evidence on cost effectiveness of interventions in the nutrition and health domains. To do this we drew on two recent large studies, by the OECD and by the Australian National Health and Medical Research Council. We supplemented their findings with estimates from our own case studies of policy effectiveness. Further we discussed conceptual issues concerning appropriate costs and benefits to include and the reliability, sensitivity and interpretation of the results. Our overall conclusion was that healthy eating policies, by operating at large scales and often at the population level, have the potential to be very cost-effective compared to smaller scale (eg. community-level) interventions or interventions targeting small slices of the population
This is particularly the case where the dietary change induced by the policy has a strong link with cardiovascular disease prevention or cancers, given the burden imposed by these on populations. Thus rigorous assessment of impact is the key in such studies, and where even a modest but statistically significant impact is detected, an attractive cost-effectiveness indicator is likely to follow. More specifically, the evidence suggests that policies that intervene to lower the content of salt in processed food and fiscal interventions such as fat taxes can be highly cost-effective. However, not surprisingly, interventions targeted at children that produce the majority of their health effects in adulthood come off worse in cost-effectiveness computations due to discounting of future benefits.

So far five papers have been published from the research in WP2, and others are in the pipe-line.


### 2.3 Workpackage 3: Private Sector Marketing Effectiveness and Relevance to Public Sector Marketing

The aim of Workpackage 3 was to suggest improvements for public sector marketing activities by looking at successful and effective private sector marketing. This was done in three steps: first, a case study on successful health-related food marketing in order to gather real-life data and examples. Second, a success factor analysis on these in order to explore the key factors underlying and explaining successful and effective communication to food. Third, expert interviews on the potential transferability of the factors and their success to public sector social marketing in the healthy eating area.

**Step 1: Case study on successful health-related food marketing examples**

A case-study has its strength in the fact that it is gathering and generating knowledge and experiences that are closely connected to the context. In a complex interaction in the area of food marketing, the same marketing-tool might turn out to be successful or not – depending on the many interactions between consumers and market actors within the even more complex macro-environment of general trends in society, in the economy or the political environment. Case-studies are also regarded as helpful in building know-how, based on the argument that by looking at many
cases, it is possible to develop an intuitive understanding for interrelations of factors within its context that enables decision-makers to come up with the right strategic decisions in the future.

All in all, 28 cases have been gathered. All cases are successful examples of marketing activities in the food and drink sector. It had been pre-defined that cases should be selected in order to have a geographical spread across the EU, should be from different food and drink categories, different company sizes as well as represent types of marketing cases such as a) new product introduction, b) product reformulation, c) (new) communicational measures and d) cause marketing. In addition, it was decided to select some examples of generic marketing as well as some examples of retailer activities and to select cases that targeted different consumer groups (e.g. adults or children), were destined for different kind of uses (e.g. daily versus occasional) and were not older than five years.

7 expert-interviews have been conducted in the search of cases, while 19 interviews were conducted in order to gather of information on cases. Interviews followed a semi-structured interview-guide. The questions, however, were adapted to each case and the specific character of the case based on information gathered on the case beforehand. Interviews were recorded and transcribed. In addition to the interviews, the documents accessible via desk research that have been selected for use in the case study are mainly drawn from the European EACA Euro Effie award, the national Polish Effie award, the IPA effectiveness award in the UK, the Eficacia award in Spain, the WARC-website’s case-study data base (with access to the European IMC-award winning cases) and the New Nutrition Business reports.

Nine of the total cases represent SME’s or companies operating mainly on a national level. These cases were well spread over EU representing different regions and countries, namely Ella’s Kitchen, Innocent (UK), Bionade, Frosta, Ricola (DE), Fortuna, Redd’s (PL), Florette (ES) and ProViva (SE). Thirteen cases were obtained from large multinationals, which are Nestlé, PepsiCo, Coca Cola, Kraft Foods, Iglo, Kellogg’s, Unilever and DANONE. Three cases represented retailers in three different cultural settings, namely Eroski (ES), Tegut (DE) and Coop Italia (I). Finally, the three remaining cases correspond to generic advertising for wholegrain products (UK) and milk (F, PL).

**Step 2: Key success factor analysis**

The first step in analysing the data collected from the 27 cases was to assign a third of the cases to each project partner to conduct a case-by-case analysis and a comparative analysis of the subset. Possible success factors were preliminarily listed within the template. The second step was a joint comparative case analysis where each project partner prepared a presentation of their cases as well as a draft comparative analysis of their set of cases. These materials were shared during a 2-day workshop where authors and project partners with backgrounds in public health nutrition, consumer science, food marketing and advertising participated. Initially, individual cases, the preliminary list of success factors, and the three comparative analyses of the subsets were discussed by the group. Thereafter, additional potential success factors were brainstormed, using the information gathered in the first step as the point of departure. Next, the number of possible success factors was reduced using a card sorting method to identify the key success factors. Finally, they were clustered into higher-order categories by combining piles that were closely related and deciding on a name that describes what they have in common. Clusters were formed because, although factors were different enough in type and application to be regarded as independent constructs, several appeared closely related enough to allow them to be grouped in a meaningful higher-order category. The clusters were arranged hierarchically and presented in a model that reflects the sequence in which they affect a marketing activity.
Six clusters of success factors emerged from this analysis and were labelled as "data and knowledge", "emotions", "endorsement", "media", "community" and "why and how". Each cluster summarises two to three success factors and is highlighted by example cases. Based on a comparison with the literature, it is argued that among the total of 16 factors identified, the factors of nutritional evidence, trend awareness, vertical endorsement, appeal to simple naturalness as well as to common values are of specific importance in the communication of health with regard to food. Whether or not these factors contribute to future success depends on the specific context of use, the combination of factors and the environment. It is argued however that public sector food and health-related campaigns can benefit from considering the specific applicability of the success factors identified in this study during the design of activities, in order to strengthening the effectiveness of the approach.

This might imply that public campaigns and interventions could be preceded by more intensive research on consumers' or citizens' behaviour and new societal trends. Public campaigns could be strengthened by adding a stronger emotional appeal, especially by highlighting the desirability of simplicity and naturalness provided by healthy food and healthy eating. Promising approaches in public activities might be those that allow the individual to link with common values, experience being part of a movement or group, or re-connect to the local community. The use of social networks and emerging online social media, largely unexplored in public food and health communication in the EU so far, should also be considered. Healthy eating recommendations ought to be simple, clear and achievable and should stress short-term benefits alongside the long-term benefit of good health. As a further recommendation, it can be useful to consider public-private-partnerships to a greater extent in the future in order to exchange expertise with regard to success factors, but also to develop the agenda even further.

**Step 3: Expert interviews on the transferability to public sector social marketing**

The process of assessing the transferability of success factors from commercial marketing to public policy requires an understanding of the factors, insights, and experience with the issue. Therefore, approaching professional experts is an appropriate choice of method. The issue at hand is, however, also a topic of considerable debate among stakeholders. Thus, a method allowing for viewpoints to be exchanged is appropriate. Owing to these reasons, a Delphi expert survey was selected. The Delphi method is a specific kind of expert interview. In an expert interview, the participants are not the object of research but the informants regarding the research object or area. The Delphi expert survey methodology takes, due to its feedback nature, relatively longer to conduct. A video explaining the study and the success factors, highlighted by an example case and based on a PowerPoint presentation, as well as a questionnaire form was developed. Experts were recruited from the public policy sector or academics closely involved with public policy in the areas of food and healthy eating, NGOs working in the same area, private sector experts who are food industry stakeholders, and experts in the advertising and communication industry. All in all, 31 experts from 60 experts contacted took part in the survey.

The objective of the questionnaire was to determine to what extent the factors established in the success factor analysis are used in public information and social marketing campaigns for healthier eating, and what is required to successfully transfer those factors into the public arena. The questionnaire consisted of six questions. Questions dealt with current application, ethical acceptability, target group differences in application, future importance, the existence and possible acquisition of resources, and the competencies required for using the factors in public policy activities for healthier eating. The answers to the six questions were analysed both with regard to average, minimum and maximum of the ratings as well as qualitatively within the text written by the experts to the various questions, the main focus however lies on the elaborations as the ratings were mainly intended as a catalyst for the thought process.
In general no striking differences for the group of private sector experts as compared to the group of public sector experts were identified, which can be attributed to the fact that many experts have a background in both areas. Thus, the results are combined assessments of the 31 experts, but contradictory views are highlighted. The main results of the Delphi expert survey was that the transferability of food marketing success factors to public sector activities are deemed potentially useful when appropriate combinations of techniques have been considered, and when consistent messages are used. Transparency and ethically acceptable practices should guide the use of marketing techniques. Participatory approaches should ensure that stakeholders endorse and further develop activities, and special focus should be given to long-term campaigns, which also favor investments in building trust for public institutions or public brands. In practice, this might imply the introduction of a code of conduct for social marketing for healthy eating, or public relations experts advising public health institutions as to their relations with the public. As also underlined by the experts, a stronger cooperation between public and private sector stakeholders is required, as well as increased knowledge exchange and interdisciplinary.


2.4 Workpackage 4: Public Acceptance of Interventions

Objectives
Besides differences in expected cost-effectiveness, alternative policy interventions are also likely to differ in terms of their acceptance by the general public. The overall objective of this work package was to compare public acceptance for alternative interventions, across countries and individuals, and focus on different sub-groups of the population (e.g. parents vs. non-parents).

Specific objectives were:
1) An evaluation of public concern towards nutrition-related issues compared to other policy priorities
2) An assessment of the level of support for alternative nutrition-targeted policies
3) An evaluation of public preparedness to respond to alternative nutrition-targeted interventions
4) An evaluation of public attitudes towards obesity and its determinants
5) A comparison with similar surveys carried out in the US²

Methods
This workpackage is based on a major primary data collection effort. The survey (whose design is summarised below) was carefully planned to ensure representativeness and the questionnaire was piloted prior to the actual field work. Deliverable 4.1 reports on all steps taken to implement the study, including the tendering process for selecting a sub-contract for field work. The resulting data-set was then the basis for advanced multivariate statistical analysis (as described in Deliverable 4.2), and during a 6-month extension of the project further ad-hoc studies on the data-set were produced. The key findings of those supplemental studies, along with the main results from the original analysis, are reported in Deliverable 4.3.

Survey design, sampling and field work
The survey was administered in five European countries (Belgium, Denmark, Italy, Poland, and the UK) through Computer Assisted Web Interviewing (CAWI). A validation survey to check for potential on-line biases using a Computer Assisted Telephone Interviewing (CATI) method was additionally administered in UK and Italy and showed that CAWI returns only slightly lower estimates of support rates compared to CAWI (contained below 5% in 16 items out of 20). Questionnaires were translated and back-translated to check for consistency across languages, then piloted in November 2010, while the actual survey took place between 7 and 22 February 2011. Sample extraction was based on disproportional stratified sampling from the GfK e-panel (414,000 potential respondents in the five countries), using age and gender as stratification variables. The required sample sizes were achieved via oversampling and by appropriate replacement procedures also based on age and gender matching. Sample size was 3,003 for the CAWI (600 in each country, except UK with 603); the average length of the interview was 22 minutes. The response rate was 18.7% (ranging between 11% in Belgium and 27% in Italy), and no particular demographic pattern was found in non-responses.

Questionnaire
The complete questionnaire included 47 questions structured in three sections, building on and extending a questionnaire which was originally developed and successfully applied in the US. A first section was aimed at collecting personal information, including demographics, subjective health status, education level, internet use, levels of physical activity (IPAQ classification), smoking, drinking and eating habits, perceived risks to own health. A series of validated questions was also included that probed the ‘regulatory focus’ of respondents, a construct arising from the social psychology literature. This measures the extent to which individuals approach new tasks with ‘promotion-based’ eagerness, or with ‘prevention-based’ vigilance, based on past experiences, and has been shown to be important in explaining how people judge public policies. In the second section respondents were asked to rate the seriousness of a selection of health risks for their country, including conditions like cancer, diabetes and heart disease and risk factors associated with individual behaviour (smoking, heavy drinking and obesity). The measurement of public support for healthy eating policies was based on 20 items formulated as statements and agreement was measured on 5-point Likert scales. Attributions of obesity were measured through 5-point agreement scales with 12 statements related to genetic, environmental and individual factors, poor diets, lack of time, discounting future health consequences, affordability of healthy foods, availability of and easy access to unhealthy foods, and lack of information to make healthy choices.

The third section was targeted at monetising acceptance of healthy eating policies and collecting information on diagnosed diseases, political views, household income and self-assessed financial conditions, and beliefs related to eating choices. Stated willingness-to-pay (WTP) measures are likely to be overestimates, but they should give a reliable representation of WTP heterogeneity across individuals. One question measured the relative importance of healthy eating policies compared to other actions to promote health, housing, security, transportation, and the environment by asking respondents to allocate among these policies the proceeds from a €150 increase in taxes. The next item asked whether the respondent would either accept an increase or demand a cut in general taxes to support each of five different healthy eating policies (public information; education; ‘thin’ subsidies; healthy-eating vouchers for low-income families; and free shopping delivery for disadvantaged groups). Based on their response to this question, respondents were asked by how much they would be prepared to accept an increase or demand a reduction in taxes, using five fixed €10 brackets, up to €50.

**Statistical analysis**

The relatively large number of items employed to measure policy support and obesity attributions enables analysis of the data using exploratory and confirmatory factor analysis, with a structural equation model (SEM) to estimate and test interactions and assumed causal relationships. These methods assume that the questionnaire items are an observable proxy of the true latent dimensions, and exploit the correlations between multiple items loading on the same construct to identify these dimensions. Thus, potential item-specific biases like wording or ambiguity end up in the error terms and are likely to become negligible. Other methods employed for the analysis of the collected data were discrete choice models (logistic regression and ordered probit models), cluster analysis, multidimensional scaling and standard regression methods.

**Findings**

Results indicated relatively high levels of public support for all healthy eating policies. The average level of support was very high, with 62.5% of responses in the agreement/strong agreement range against only 12.1% in the disagree/strongly disagree range. The policy measure with least support in most countries was the imposition of standards on workplace meals (40.6% agreed with such a measure, and 24.8% opposed it). Bans (advertising to adults, vending machines in schools) also received relatively less agreement. The statements which received the highest level of support were healthy eating education in schools (84.8% support and 3.9% disagree), and compulsory labelling with nutrient and calorie information on all foods (80.8% vs. 4.4%). Public subsidisation to reduce fruit and vegetable prices was also highly supported (70.1%). Average stated support is highest in Italy and lowest in Denmark. Many consistencies emerge across countries, like the low support for banning advertising to adults and the high support for education measures and labelling. The least consistency is observed for government–industry cooperation in reformulating foods, which receives good support in Italy and Belgium, and a much lower support in Denmark and the United Kingdom. We explored how the choice of running an on-line survey (CAWI) on these topics could affect the result relative to other administration methods such as telephone interviewing (CATI). There are two potential sources of bias, one associated with the different characteristics of internet users from non-users (e.g. lower age, higher education), which was also mitigated by the application of post-stratification bias, the other related to the respondent interaction with the administration method. In general, we found that the relative support to policies is not too affected by these biases, although the CAWI method does generate a major increase in those choosing neutrality when faced with the policy support items.
In terms of agreement/disagreement for attributions of obesity, individual failure (lack of will-power with 78\% or lack of self-control with 72\%), is perceived as the main driver of obesity, followed by the excessive availability of snack and unhealthy foods. Genetics-related statements generated the highest level of disagreement. Among all causes, those for which public opinion is most divided are related to financial and time constraints. The results are consistent with those reported in the US study by Oliver and Lee, but opinions in Europe are stronger (e.g. 78\% agreeing with lack of willpower in Europe versus 65\% in the US survey, or 27\% agreeing with inheritability of obesity in Europe versus 40\% in the US). Whether these discrepancies can be ascribed to the survey location or to the long time elapsed between these two surveys remains an open question.

Based on exploratory and confirmatory factor analysis, public support items and obesity attribution items were summarised into a small set of interpretable latent factors. All extracted factors came out neatly in terms of interpretability and fit, and rotation of questionnaire items guaranteed that this was not due to order biases. The classification of healthy eating policies resulted in four groups: advertising restrictions, information policies (education, labelling and social marketing), fiscal interventions (taxes, VAT measures and price subsidies), and policies relating to content and access (vending machine bans, nutritional standards, reformulation drives, vouchers for low-income consumers). Attributions of obesity also generated four factors, reflecting responsibility ascribed to individual factors (lack of willpower, discounting the future, not caring about being obese, ineffectiveness of diets), the supply environment (excessive availability of unhealthy foods supermarkets and restaurants, too many snack foods readily available in workplaces, shops and homes, lack of information.), economic factors (prices, incomes, time availability), and genetic factors (obesity inherited from parents, obese individuals are born that way). Factor analysis was also carried out to uncover latent factors underlying variables in the survey relating to health risk perceptions and beliefs driving food choices.

The complex set of relationships between the latent variables was explored through a structural equation model, which shows an excellent goodness-of-fit by SEM standards. Attitudinal drivers emerged as the most influential factors driving support. Of these, obesity attributions are confirmed as an important predictor of healthy eating policy support, as in previous studies, but the SEM model goes further by indicating the primary importance of the specific set of attributions referring to the food supply environment. People who agree that these are major determinants of obesity are very supportive of all types of healthy eating policy, but especially the regulation of markets. In order of importance, the next factor relates to beliefs about eating. People whose food choices are determined by the calorie and fat content of foods, and who are careful about their cholesterol tend to be more supportive of healthy eating policies, especially fiscal measures. People concerned with credence characteristics like animal welfare, environmental impact and safety report significantly lower policy support, especially for fiscal measures. When health risk factors are associated with individual behaviour (e.g. obesity, smoking, depression) support increases, especially for advertising bans and fiscal regulations. Instead, if the emphasis is placed on diseases associated with health trends in society at large (e.g. cancers, heart disease), there is a significantly lower support for advertising restrictions and no effect on support for fiscal policies. Those who frequently consume fast food or pre-packaged meals are less supportive of policies, especially advertising bans. All other significant covariates move in the expected direction, but the magnitude of the effects is very small. After controlling for the explanatory factors, there is still some unexplained country variability, as witnessed by the small but significant country effects. Once more, the Danish sample is associated with a preference for fiscal measures, and the UK and Belgian with a relatively larger support for advertising bans.
A major finding of the project was a very loose link between stated support and individual willingness-to-pay to fund policies (also in relation to other public policies not related to eating habits). Denmark stands out as willing to allocate the highest share of the hypothesised $150 tax increase to healthy eating policies, about €29 compared to €20 or less in other countries. Second, respondents were asked how much extra tax they would be willing to pay, or would need to be given, in order to accept five healthy eating policies. Denmark is also the only country to return a positive and significant value of average willingness-to-pay to support the five selected healthy eating policies (about €14). In Italy the figure is not statistically significant, all other countries reported negative significant average values between €11 and €13, which indicates a preference for tax reduction and less funding.

Based on statistical analysis, among the major determinants of WTP, in order of importance, there are: being a Danish respondent, left-of-center political views, being female and higher education levels. Compared to the determinants of support, attributions of obesity lose relevance, or even change sign, and the direct relationship between stated support and willingness-to-pay loses relevance when looking at the sample of supportive respondents.

Further analyses were carried out to explore the role of risk perception, focus on specific population sub-groups, and analyse interactions with other behaviours, for example information search and eating out habits. In terms of concern for health risks from unhealthy diets, respondents were generally neutral towards their personal risks and rating habits were ranked third after stress and weight. Gender, age, country of origin, health motive underlying meal choices, body mass index, and subjective health status were important determinants of the perceived personal risk from eating habits, whereas perceived financial condition, smoking and educational level were not significant.

We also explored whether the sub-group of parents would differ from non-parents in terms of policy support. We did not find evidence in that direction, and the extent of agreement with policies is not explained by the fact of being a parent or not. One exception is the measure related to vending machines, as parents in the sample were more likely to support a ban than non-parents.

In terms of information search, we found that nearly half of the survey participants did not know where to look for healthy diet related information. Socio-demographic determinants affect information literacy. Men, less educated, poorer and sicker are less likely to know about where to look for such information and are less likely to attempt finding it. As far as eating behaviours are concerned, after adjusting for potential confounding factors, the association between eating out frequency and BMI resulted attenuated and no longer statistically significant.

Concluding remarks
Preparing the ground by implementing a strong programme of awareness-raising activities ahead of and during the introduction of a specific policy measure is advisable. More generally, giving thought to sequencing of policy measures may be important. Public information campaigns that shape attitudes by informing consumers of health risks inherent in the food environment and by encouraging individual responsibility in dietary decision-making may usefully precede more paternalistic policies such as fiscal measures.

Workpackage 4 was only completed in February 2013. Several articles are under review, others under preparation for future publication.

2.5 Workpackage 5: Propose Effective Policy Interventions, Methods of Evaluation and Data Collection Priorities for the Future
Objectives:
1. To synthesise the evidence on policy effectiveness and cost effectiveness and make evidence-based policy recommendations to Member States and the EU.
2. Make recommendations on data collection priorities for future policy evaluation.
3. Provide a framework for future nutrition policy evaluation.

Evidence on policy effectiveness and cost effectiveness and recommendations to Member States and the EU.

Method
A document with draft recommendations and the evidence for them was prepared under the guidance of the Project Leader, drawing on all of the earlier research. The draft was circulated and discussed by all partners and by the project Stakeholder Advisory Board and duly revised on the basis of these discussions. Feedback was obtained from four stakeholder workshops held in Poland, Denmark, Italy and Brussels with relevant stakeholders from civil society (consumer and health NGOs), the food industry and national and European policy makers. Workshop reports were combined into a single summary document indicating support or disagreement of the various groups for each of the recommendations, their reasons for any disagreement and proposed amendments. Following this the policy recommendations were amended and further discussed at a partners’ meeting before finalisation (in September 2012).

Using our classification of interventions (see WP1 above), for each policy we presented in our Report (D5.1) first the evidence on policy effectiveness followed by evidence on cost effectiveness and our evaluation of the strength of the evidence. For each policy this is followed by the evidence from the survey on public acceptance and our recommendations. In what follows below, the recommendations are presented without the accompanying evidence which is fully presented in D5.1.

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.

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 would 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**

- Too many current public information 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.
- These sustained campaigns could benefit from incorporating key success factors of commercial marketing and best practice social marketing as identified in EATWELL (see WP3 above). 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 long-term health.
- 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 in vending machines in schools has a small but cost-effective impact on diets and is recommended, but machines should supply healthier food choices rather than imposing an absolute ban.

**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**

According to criteria we established for sound policy evaluation, very few EU 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.

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).

**A framework for future nutrition policy evaluation.**

In general, issues in evaluating the effectiveness of nutrition policies can be categorized as originating from: i) inadequate data and measurement (which is the focus of Eatwell Deliverable D5.3, summarised below) and ii) inadequate methodologies (which is covered by this section, drawn from D5.2).

The project developed a set of criteria for sound evaluation of policy effectiveness:

- 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.
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).

The main statistical issues pertain to the classical evaluation problem of estimating what would have happened without the policy in order to provide a benchmark (the *counterfactual*), irrespective of the kind of treatment under analysis. The classical evaluation methods through which the problem of estimating the unobservable counterfactual are set out in detail in D5.2. Several of these are demonstrated in the section on Eatwell case studies undertaken as part of WP2 and described above.

A set of potential issues relate to the structural and behavioural framework of the outcome variable. This category includes: the potential effect of market forces on the outcome variable (e.g. the effect of prices on consumption); the potential bias arising when some drivers of the outcome variable are in turn affected by the programme and the causal links among variables is not clearly identified (in econometrics this is the classical endogeneity problem); any potential change of the impact over time (differences between short-term impact and long-term impact); compensating behaviour (for example a trial measuring the effect of restriction of junk food in one setting should measure whether people compensate by consuming more at other times); and heterogeneity of the policy impact among individuals or groups.

In addition to these difficulties in measuring policy effectiveness, reliable estimation of cost-effectiveness further suffers from difficulties linking behavioural change to ultimate health effects and difficulties monetising costs borne by all concerned economic agents caused by the policy.

The best solution to these difficulties is to plan and design simultaneously the intervention and its evaluation. Yet, even when this option is not feasible and imperfect data are available, evaluation is possible provided the statistical problems discussed above are recognised and accounted for. A full discussion of these statistical issues is available in D5.2.

**Recommendations for data collection priorities for policy evaluation.**

While some of the required information is necessarily based on direct measurement (e.g. demographic characteristics of people affected by the policy), evaluation is not dependent on direct observation of all relevant variables. For example, market price information can be obtained from purchased values and quantities recorded in household budget surveys, and persistence of habits might be inferred econometrically by employing time series and dynamic modelling techniques. Deliverable D5.3 discusses the information requirements for appropriate impact assessment of nutrition policies and provides examples of evaluations, distinguishing between those based on purposely collected data and those using pre-existing secondary data. In many cases a combination of the two is the best option for policy evaluation: accurate impact assessment and cost-effectiveness necessarily require some primary data collection (particularly the costs related to the policy), but the use of secondary data is recommended to supplement and refine many of the linkages between variables. The following list of recommendations from D5.3 is structured into two sets. The first group covers primary data collection strategies, the second indicates priorities for the use of secondary data, including recommendations to improve the current data collection procedures.
Primary data
- Use a representative control sample (through randomization or probabilistic sampling)
- Collect data for as long as possible after the policy to estimate long term effects.
- Measure confounding factors which may influence behavioural outcomes.
- Measure actual behaviour rather than self-reported knowledge, attitudes or behaviour.
- Measure behaviour outside the target environment to capture compensation effects.
- Use scientifically accepted and validated definitions and measurement scales whenever possible.

Secondary data
- In household budget surveys, measure purchased quantities as well as values to avoid problems with quality differences implicit in using unit values.
- Similarly, in nutrition surveys, include prices or expenditure as well as quantities.
- Nutrition surveys should also associate food intake with eating occasion.
- In health surveys, collect data on costs.
- Use scientifically accepted and validated definitions and measurement scales whenever possible (e.g. demographic variables, physical activity).
- Conduct surveys regularly and avoid too frequent definitional changes in order to provide a longitudinal component.
- Include measurement of psychological drivers in surveys recording behaviour.

The following publication concerns policy evaluation and recommendations. Others are under review.


2.6 Overall Project Conclusions
EATWELL has been a complex project in a fast-moving area where new policies are continuously being introduced or dropped (e.g. the entire concept of ‘nudging’ people to eat better was not on the agenda at the time EATWELL began its research, now it is high on the agenda in many countries. A ‘fat tax’ was introduced in Denmark in October 2011 and dropped again before EATWELL’s completion. In such a context it is hard to draw absolutely firm conclusions on policy effectiveness, especially concerning the longer term, impacts on vulnerable sub-groups of the population, policy synergies and so forth. We conclude that there is plenty of scope for more and better policy evaluation but that the case for action is urgent and there is sufficient evidence to support new and improved policies to promote better eating in the EU Member States.

3. EATWELL impact and the main dissemination activities and exploitation of results

Like all research projects the impact of EATWELL will be easier to assess with the passage of time. What we can say is that it has produced sound science which has been published in good quality
public health, health economics, nutrition and marketing journals following rigorous peer review. The project has maintained an interdisciplinary approach and many of the publications reflect this. Many more articles are in the pipeline. It has made concrete policy recommendations which have been widely disseminated to a range of relevant stakeholders including policy makers at the national and EU levels, the food industry, and consumer and health NGOs. We have interacted during the research process with international agencies such as OECD and WHO as well as national governments and industry representatives. The research has had a special focus on education and children, and other relevant sub-populations like the elderly.

The following is a description of the various dissemination actions taken within the project.

Over 4 years from 2009 to 2013, EATWELL researchers have published, submitted and produced drafts of 35 research papers in peer-reviewed journals (14 uploaded on SESAME), with 4 being open access. Researchers from the project have produced a total of 81 conference abstracts, interviews, newsletters, news reports, posters, presentations, symposia and talks. This material reached an international audience of over 5,500 conference participants and thousands of readers. These audiences are made up of researchers, food industry professionals, non-government organisations, health professionals, communicators, journalists, policy makers, the public and more.

3.1 Project Identity

The EATWELL project aimed to learn from best practice of interventions and public awareness campaigns. Its visual identity reflected the breadth of the interventions that were being considered (from farm to fork) while recognising that attitudes toward food were culturally deeply rooted.

3.2 Communication and dissemination plan

To support all communication activities, EUFIC created a communication plan. The target audiences were regulators, industry, communication agencies, consumer groups and academics. This plan was shared with the consortium at the bi-annual meeting in Krakow 2009. There was general agreement from the consortium regarding the approach, and partners understood the role they were expected to play in dissemination of EATWELL’s results.

3.3 Produce and Deliver range of dissemination materials and activities

Specific Web-site development and maintenance:
The project website was set-up at www.eatwellproject.eu. The EATWELL project was also promoted within a section on the EUFIC website (www.eufic.org: in 2012 the website received 3.2 million unique visitors; source: Google Analytics), with the aim to drive traffic to the EATWELL website.

At the beginning of the project, EUFIC recorded talks from a Berlin stakeholder meeting in April 2010 and made webinars from these, which were posted on EATWELL’s extranet for stakeholders and partners to download.

**First EATWELL leaflet:**

In June 2010, the first leaflet that introduced the main aims and objectives of the project was produced. There were 2,500 copies made. Each partner received their allocation at the April 2010 bi-annual consortium meeting. In September 2010, EUFIC had a stand at the 2nd World congress of Public Health Nutrition in Porto where the first EATWELL leaflets were handed out to conference participants. In addition, EUFIC also had a stand at the CIAA Congress in Brussels between 18-19th November 2010, where EATWELL leaflets were also handed out too.

**Food Today articles:**

Articles were produced in EUFIC’s scientific newsletter, Food Today, in order to disseminate project news to a wider audience. Food Today reaches scientists, opinion leaders and regulators, nutrition and public health professionals, educators, food industry, and media.

The first Food Today article, ‘Improving policy interventions key to promoting healthy eating in Europe?’ was published in EUFIC’s multi-lingual newsletter, Food Today, in October 2009. [http://www.eufic.org/article/en/artid/improving-policy-interventions-to-promote-healthy-eating-in-Europe/](http://www.eufic.org/article/en/artid/improving-policy-interventions-to-promote-healthy-eating-in-Europe/), was sent to out in English, French, Spanish, German, Italian, Czech, Slovak, Greek, Polish, Hungarian and Portuguese. It was also sent to EUFIC’s distribution list of over 49,000.

The second Food Today article, ‘Can policies create a healthier Europe?’ summarised the project outcomes and was published in March 2012. Printed copies were distributed in English, French, Spanish and German, whilst the electronic version was sent out in English, French, Spanish, German, Italian, Czech, Slovak, Greek, Polish, Hungarian and Portuguese. [http://www.eufic.org/article/en/page/FTARCHIVE/artid/Can-policies-create-healthier-Europe/](http://www.eufic.org/article/en/page/FTARCHIVE/artid/Can-policies-create-healthier-Europe/)

**Media coverage from Belgian fruit and vegetable week from Ghent University:**

During the fruit and vegetable week in Belgium, 2012, the Ghent University sent out a press release mentioning the EATWELL project, which received some national coverage:

- News item with interview on national radio (VRT Radio 2).
- News item with interview on regional TV (AVS Oost-Vlaanderen).

Although the message contained rather minimal information, its coverage was a success with an exposure estimated at over 2 million:
Het Laatste Nieuws (newspaper): 1,000,000
De Standaard (newspaper): 350,000
De Morgen (newspaper): 265,000
Radio 2 (radio): 350,000
AVS TV (regional television): 150,000

Podcasts:

Three podcasts were produced in total by the EATWELL project. These were made available on the EATWELL website as a varied form of communication material, which the public could engage with, and was part of EATWELL’s communication strategy plan. As only two podcasts were specified to be created in the project tasks, one extra podcast was created as an added value.

1) EATWELL Podcast: interview with Professor Bruce Traill

This podcast was produced at the beginning of the project, on EATWELL’s website and eufic.org. The podcast page was viewed 384 times.

2) EATWELL results: how can private sector marketing techniques help improve public health?

In this podcast, posted in July 2011, Jessica Aschemann-Witzel described the project’s investigation of private sector marketing techniques and considered whether these may be applicable to public efforts to promote healthier eating. It was posted on the project website as well as eufic.org. The podcast page was viewed 851 times.

3) Estimating the effects of healthy eating policies

Professor Bhavani Shankar, leader of EATWELL’s work on the quantitative estimation of diet policy effects, assessed the effect of a range of policies implemented in Europe. In this podcast, he spoke about his work, sharing some of the results and insights he gained into the process of dietary policy evaluation. He also explained why the EATWELL project was important and his hopes of the impact of the research.

The podcast was posted in September 2012 on the project website as well as eufic.org. The podcast page was viewed 71 times.

Press releases:

The goal of press releases was to reach the media and wider public with timely and targeted news about the EATWELL project. The dissemination strategy was as follows:

- Press releases published on EATWELL website.
• Posted on AlphaGallileo, which is an independent source of new research, distributing news releases and other information from science, health, technology, the arts, humanities, social sciences and business to the world's media. It has contact with 1,700 research organisations and about 8,000 journalists.
• Sent to partners and their institutional press officers, released on institutional websites and national press agencies.
• Sent to EUFIC media contacts.

The first press release from the EATWELL project was published in 28 May 2009.

1) Can the private sector help the ‘nanny state’ play a crucial role in selling better eating to the public and reduce health care costs?:

2) Policies for a healthier Europe: Results from the EATWELL project:

3) Do Europeans want governments to direct their eating choices?:

After the press releases were published, the Ghent University, Aarhus University and University of Bologna (UNIBO) took media enquiries. The press releases were posted on AlphaGallileo, sent to EUFIC media contacts, were translated by EUFIC and sent to partner press officers for national circulation. In particular, UNIBO, Ghent University, Aarhus University, University of Reading and Jagiellonian University Medical College sent out the press releases to their national contacts. The press releases were also placed in the press room of a conference session: 'Evaluation of Interventions to Promote Healthy Eating: Results from the EATWELL project' on Thursday 27 October 2011. This generated an on-site interview with UNIBO.

Below are further media pick-ups of the press releases:

The European press also picked up the press release in EU Food Law and EU Food Policy.

Italian press:
• 2 articles in Italian press (Il Fatto Alimentare and Ansa).
• Mario Mazzochi (EATWELL researcher) was interviewed twice by the above two outlets.

Belgian press:
• De Morgen (Subsequently a large opinion article was written by Wim Verbeke.
• Metro
• Belang van Limburg
• Artsenkrant (Peridical for medical doctors and professionals).
• Gazet van Antwerpen
4) A final press release was produced to coincide with the final EATWELL session at the 5th European Public Health Conference, in Malta, on the 8th November 2012: Creating a healthier Europe: Recommendations for healthy eating policy interventions:  

The press release received a number of media pickups on websites, magazines and journal publications. It was picked-up on 9 different news websites, publications and blogs including: EU Food Policy, COFACE.eu.org, Health Canal.com, NutraIngredients.com, Food Product Design.com, South East Tip.co.uk, Global Food Mate, Fresh Produce.org.uk and the Common Agricultural Policy.blogspot.be.

Scientific dissemination:

As results were generated by the project, research papers were submitted to academic journals and timely press releases produced to disseminate news to concentric circles of audiences such as policy makers, researchers, the media and public. A list of scientific publications by EATWELL project researchers can be found here: http://eatwellproject.eu/en/Eatwell-research/Scientific-publications/.

Final Project Leaflet:

A six-page final project leaflet was created at the end of March 2013, 2,000 printed versions were produced in English and the e-version was translated into Dutch, Italian, Danish, Polish and French languages. Partners from the University of Reading, University of Bologna, Aarhus University, Ghent University, European Association of Communications Agencies and Jagiellonian University Medical College asked for a total of 360 printed leaflets initially to distribute it at events and conferences. All versions of the leaflet can be downloaded from the EATWELL website: http://eatwellproject.eu/en/Media-centre/Final-leaflet/.

Stakeholder involvement and communication:

To achieve active involvement from stakeholders, a Stakeholder Advisory Board (SAB) was established that served as a valuable discussion platform to the consortium. The SAB comprised representatives from academia, policy and communication specialists as well as NGOs and the food industry.

The first SAB took place in April 2010. SAB members agreed to disseminate EATWELL results throughout the duration of the project.

3.4 Conduct Final workshop

On 8th November 2012, a session was held by EATWELL to present the final results at the 5th European Public Health Conference, in Malta. The conference was attended by opinion leaders, other researchers, policy makers, and practitioners in the field of public health and health services research.

The EATWELL session had over 60 participants. EUFIC organised the final session, coordinated the talks and invited stakeholders to attend. Dr. Jo Wills chaired the meeting.
EUFIC also produced a glossy version of the 63-page final policy recommendations report, which was handed out during the meeting in Malta. There were 150 printed and 50 loaded onto USB sticks. These were distributed at the final conference in Malta and at subsequent talks given by the project partners. The report is also available to download: [http://eatwellproject.eu/en/upload/Reports/Deliverable%205_1.pdf](http://eatwellproject.eu/en/upload/Reports/Deliverable%205_1.pdf).

And a roll-up poster was produced for the final EATWELL session. It summarised the project’s primary objectives of improving nutrition policy in EU and member states, and stated its main achievements.

**Final Webinar:**

EUFIC recorded all the final conference sessions and produced webinars, which are an added value activity beyond specified tasks of the project. Six webinars were produced from the conference and published on a new splash-page on the EATWELL website, which are downloadable from [http://eatwellproject.eu/en/Media-centre/Final-webinar](http://eatwellproject.eu/en/Media-centre/Final-webinar). The reason for the webinars is to enable further dissemination of the EATWELL results beyond the final conference, as it available on the EATWELL website, and ensures longevity for final results beyond the lifetime of the project.

### 3.5 EATWELL project results dissemination in academic publications:

In order to generate a groundswell of wider interest as EATWELL finished, a number of articles were planned to be published one after another at the end of the project, in scientific publications which reached a total of around 200,000 subscribers. Audiences are broken down into industry professionals, R&D, technical and non-technical audiences, policy makers, corporate planners, farmers, environmentalists, industrialists, NGOs, researchers, public authorities, nutritionists, food authorities, health professionals, journalists and students.

1) **International Innovation** reaches 40,000 readers. The magazine is circulated 8 times per year to over 10,000 industry professionals selected for their position, influence and spending power in the development of science and technology across Europe. The Eatwell article was published in their April 2013 edition: (Pages 130-131.)

2) **Public Service Review UK** publication has a subscriber base of 70,000. The Eatwell article was published in April 2013. [http://edition.pagesuite-professional.co.uk/Launch.aspx?EID=39b85505-4c7e-4e86-b422-febd8bc02da8](http://edition.pagesuite-professional.co.uk/Launch.aspx?EID=39b85505-4c7e-4e86-b422-febd8bc02da8) (Pages 2, 60 and 61.)

EATWELL promotional banner location: [http://www.publicserviceeurope.com/eu-policy-area/health](http://www.publicserviceeurope.com/eu-policy-area/health)

3) **Projects Magazine** has a subscriber base of over 40,000 readers and is published 8 times per year. The EATWELL article will be published in April 2013.

4) **Nutrition Bulletin** has 80 institutional subscriptions that span the globe. They have over 80,000 downloads per year, with over 10,000 unique visitors to their site last year. The EATWELL article copy was submitted in March 2013. The article will be published in June 2013.
3.6 The address of the project public website, relevant contact details, project logo, photographs illustrating and promoting the work of the project.

Project acronym: EATWELL
Project title: Interventions to Promote Healthy Eating Habits: Evaluation and Recommendations

The scientific representative of the project's co-ordinator:
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Tel: +44 (0) 118 378 8389
Fax: +44 (0) 118 975 6461
E-mail: w.b.traill@reading.ac.uk

Project website address: www.eatwellproject.eu

Project logo

List of beneficiary

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<th>Name of beneficiary</th>
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<tr>
<td>1. The University of Reading</td>
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<td>2. Aarhus Universitet</td>
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<td>3. Alma Mater Studiorum-- Universita di Bologna</td>
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<td>4. Ghent Universiteit</td>
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<td>6. The Jagiellonian University Medical College</td>
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<td>9. European Association of Communications Agencies SCRL</td>
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<td>10. School of Oriental and African Studies University of London</td>
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Brochures and leaflets
Podcast during final conference

A podcast was produced with Bhavani Shankar. This was the third podcast created during the EATWELL project. As only two podcasts were specified to be made in the Description of Work, one extra podcast was created as an added value.

EATWELL: Estimating the effects of healthy eating policies

The EATWELL project aims to provide European Member States with best practice guidelines to develop appropriate policy interventions that will encourage healthy eating across Europe. In order to do this EATWELL has brought together a range of stakeholders including researchers, health professionals and government bodies to coordinate and implement the project.

Professor Bhavani Shankar, leader of EATWELL’s work on the quantitative estimation of diet effects, has assessed the effect of a range of policies implemented in Europe. In this podcast, he speaks to EUPIC about his work, sharing some of the results so far and the insights he has gained into the process of dietary policy evaluation. He also explains why the EATWELL project is important and what he hopes will be the impact of the work.

Click here for more information about the EATWELL project.

About Bhavani Shankar

Bhavani is co-principal investigator of EATWELL and Professor of International Agriculture, Food and Health at Leverhulme Centre for Integrative Research in Agriculture and Health (CIRAH) and the Centre for Development, Environment and Policy (CEDEPS) at the School of Oriental and African Studies (SOAS), University of London. He is also joint editor of Food Policy, an Elsevier journal, and a member of the Standing Panel for Impact Assessment (SPIA) for the Coordinating Group for International Agricultural Research (CGIAR).

He is an applied economist and his current research interests include the analysis of economic drivers of over and under nutrition, nutrition transitions, dietary policy evaluation, impact assessment and the role of agriculture in enabling better nutrition and health. In the past, his research involvements have included analysis of animal disease in the Sub-Saharan region, flour-based resource management in Bangladesh and the evaluation of transgenic cotton performance in South Africa and India.

URL: http://www.research-europe.com/magazine/FOOD/F7/index.html (Pages 130-131)