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Reformulation for healthier food: a qualitative assessment of alternative approaches¹.

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Abstract

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 paper presents findings from 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 find 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

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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.

1. Background

That obesity is costing European health-care systems billions of Euros is well established (e.g. Foresight, 2007). However, the costs of poor diet quality may be even greater; the UK government calculated that if everyone followed UK nutritional guidelines for fruit and vegetables (at least 5 portions a day), salt (at most 6g per capita per day) and saturated fats (maximum 11% of energy intake), 71,000 premature deaths per year could be avoided (Cabinet Office 2008). This represents 10% of current annual mortality and the health benefits of avoidance could represent £20b per year (Cabinet Office p 11)³ compared to £6b per year

³ Though using a conservative estimate of £1m as the value of a statistical life, economic cost would be over £70b per year.

health costs of obesity. While there is some doubt as to the original source for the number of lives per year saved and a suspicion they may be an over-estimate, it is accepted that poor diet quality is a serious public health and economic problem.

European governments have responded with policies intended to improve diets; by 2010 we had counted 111 such interventions (Capacci et. al., 2011). Product composition standards are a potential measure to improve diet quality, but in the EU, only Denmark in 2003, and more recently Austria have enacted such legislation, in both cases to limit industrially produced trans fatty acid (TFA) levels⁴. Other countries, such as the UK, Sweden and France, have attempted to promote healthy food product reformulation through collaboration with industry to voluntarily reduce levels of trans and saturated fatty acids and salt; commitments to reformulate are also a major component of the EU Platform for Action on Diet, Physical Activity and Health (hereafter the Platform). In the main, these actions have not been formally evaluated nor the relative merits of voluntary vs mandatory approaches assessed. These are the main objectives of the current paper.

Defining the boundaries of the study is complicated by a number of factors. First, firms are forever reformulating products for commercial gain in the normal course of new product development, and for many of these, health is the primary driver (Food and Drink Federation, 2007). This makes it complex to identify change that can be specifically linked to government-industry collaboration. Second, reformulation is frequently motivated by food labelling legislation. This may be linked to nutrition claims (e.g. low fat, light), to obtaining a 'better' profile in traffic light labelling or a clean label through the elimination of e-numbers. Such measures are deemed outside the scope of the present study. Similarly, we do not consider the addition of healthy ingredients to food (e.g. fiber, omega-3 fatty acids) nor attempts to reduce portion size.

⁴ Outside the EU, Switzerland, the State of California and New York City have or are in a process of implementing restrictions on the use of industrially produced trans fatty acids

The research was undertaken through country case studies in Denmark, UK, Italy and Poland as well as of the commitments made within the European Platform. The approach is discussed at greater length in the methodology section.

2. Issues and Literature

Unsurprisingly there is not a vast academic literature as this subject does not lend itself readily to rigorous analysis. The limits to reformulation are established by consumer acceptance, food safety (e.g. salt is a preservative), technological challenges—trans and saturated fats, sugar and salt all play functional roles in foods—and, in a few cases, food regulation (e.g. the use of full fat milk is required in the production of certain cheeses) (see van Raaij et. al., 2008). Much of what has been done has asked the question whether what replaces the substituted product is necessarily better for health (e.g. if saturated fats replace trans fats—see e.g. Ratnayake et. al. , 2009; European Commission, 2010). Others have studied the impact of the use of healthy eating logos as an incentive to reformulate, for example Pick the Tick in New Zealand to signal salt in food (Young and Swinburn, 2002) and the Choices label in the Netherlands (Ratnayake et. al., 2009). The former found that 33 tonnes of salt were removed from products in a year (not so impressive when translated to 0.02 g/head/day), the latter that hypothetically consuming only products qualifying for the Choices label would bring Dutch nutrient intakes in line with dietary recommendations. Both studies demonstrate the difficulty of separating labeling and reformulation policy as the use of a logo is a common reward as well as an incentive for reformulation (Caswell and Padberg, 1992; Caswell 1992).

The Choices study (Ratnayake et. al. 2009) may be interpreted as implying that the principal barrier to reformulation is consumer acceptance (of quality and price), not functional requirements, safety or regulation, since there already exist products that could be substituted for presently chosen foods (without a fundamental change in diet structure). Webster(2009) suggests that consumers are often put off by claims such as ‘low salt’ which they associate with low taste and that “stealth” may be a more successful strategy to achieve reformulation.

Compared to binding measures, voluntary agreements are argued to provide firms with greater flexibility, exploiting company expertise, reducing overall costs, stimulating innovation and

furthering the understanding and trust among stakeholders (Segerson and Miceli, 1997). In this vein, Unilever, for example, has screened all products for levels of salt, sugar, saturated fats and trans fats. Each product has been assessed against dietary recommendations from international and national authorities and the methodology has been published in a peer-reviewed scientific journal (Nijman et. al., 2007).

The need to make a choice between products with varying levels of unhealthy nutrients may, take a toll on consumers' information processing capabilities (Mayer, 2008). Thus in spite of the many advantages of voluntary agreements, mandatory regulation may be preferable from a consumer perspective. This is particularly the case if the evidence of health risks is substantial.

Reformulation may affect competitive dynamics at both the national and the international levels. At the level of domestic competition, the costs of compliance typically put some firms at a disadvantage. Large firms with lower average fixed costs per unit of output may gain competitive advantage from regulation.

National regulations typically imply higher costs, and hence competitive disadvantages, compared to firms in other countries, but if compliance is easier for domestic firms compared to their foreign competitors, a national regulation may give the former the upper hand on their home markets (Vogel, 1997). Thus, depending on the relative importance of the home market compared to export markets, domestic companies may be willing to support the instigation of stricter national regulations. Stricter national regulations may also be supported by the suppliers to the regulated industry (Vogel, 1997). This is, for instance, the case when rigorous regulation of food formulations facilitates the sales and exports of new food processing technologies.

The instigation of regulation in one country may affect regulation of the same issue in other countries; following the BSE (Mad cow disease) scandals of the 1990s, the increased focus on consumer risks and harmonization of safety regulation in the European Union facilitated the diffusion of food safety regulation between the member countries (Holm and Halkier, 2009). Similarly, once multinational firms make the investment to reformulate in one country, they may be more likely to reformulate in other markets they serve, even if not required to.

3. Methodology

The work was undertaken under the auspices of the EU funded Eatwell project (Eatwell, 2009). The project's main objective is to determine what policy interventions work and what ones don't, based partly on a review of evaluations, partly on case studies, of which this is one. The countries involved in this study were Denmark, UK, Italy, Poland and the EU (through the Platform). These countries show good diversity, with representation from the South, the transition economies, the UK, which has been the earliest mover in industry-government collaboration for reformulation, and Denmark, which was the first country to introduce a mandatory standard (for trans fats).

Case study research is ideally suited to complex situations with many factors interacting and insufficient data for quantitative analysis (Westgren, 1998; Yin, 1984). Multiple approaches and sources can be used as appropriate; here we rely mainly on government documents and in-depth interviews.

Following a review of available literature, the group agreed the research questions. These were:

1. Have reformulation actions been effective and cost-effective?
2. Is collaborative action between government and industry more likely to be effective than industry acting alone?
3. Are there circumstances under which legislation is preferable to voluntary action?
4. Are there benefits to European as opposed to separate Member State action?
5. What are the implications for competition?

In each country, and for the Platform, the appropriate project partner first developed a short back-ground document of the history and any evaluation of effectiveness of actions based on 'grey literature' prepared by industry, government, NGOs and others. This was completed during autumn 2010. Based on this, interview guides were developed and refined through electronic communication among the authors; slightly different versions of the guides were developed for interviews with policy makers, industry representatives and NGOs. The guides

formed the basis for semi-structured interviews undertaken between January and April 2011. It was intended to hold interviews with around 6 people per country, either face to face or by telephone, though in practice it wasn't always possible to organise this number (see list of interviewees in Appendix). In some cases, written responses to the questions were given in place of interviews. Interviews were recorded and transcribed. A separate report was written by each partner and discussion of these led to this synthesis paper.

4. Reformulation Actions in the Case Countries.

This section reports the actions of Governments and/or food manufacturers in the case-study countries. In Denmark the study focuses on the trans fat ban. In the other 3 countries, voluntary actions relating to trans fatty acids and salt are reported. The UK has also acted with respect to saturated fats, but with little progress so far. More recent efforts to limit sugar or total calories or to encourage consumption of healthy nutrients (through fortification or addition of fiber) were considered outside the scope of the study.

4.1 Denmark: banning trans fatty acids (TFAs)

Artificial trans fatty acids occur mainly in margarine, fast food, soup mixes, cakes, biscuits, candy, chips, donuts, pastries and french fries. The Danish legislation on trans fats (bekendtgørelse nr. 160 af 11. marts 2003), which took effect on 1 January 2004, implemented a maximum level of 2% of the total oil or fat sold directly to consumers, or used as ingredients in all processed foods. For products using the claim "Free of trans-fats", there must be less than 1g of trans fat per 100 g of fat in the final product.

In 2004, after the introduction of the special Danish ban, the Commission claimed that Denmark failed to fulfil its obligations under the terms of the EC Treaty Articles 28 and 30 on the free movement of goods. In April 2006, the EU suggested that the limit of trans fats be set at 10 percent. The European consumer organization, BEUC, supported Denmark in June 2006 by urging the Commission not to interfere with the Danish regulations, but instead introduce similar rules across the EU. After the Danish authorities sent detailed scientific documentation to support the Danish rules and argued that there were no suitable alternative measures to

ensure the same level of protection, the Commission announced in March 2007 that the case against Denmark was terminated

The Danish interviewees all pointed at the intense Danish media coverage in the wake of a Lancet article on trans-fat consumption and coronary diseases (Willett et al., 1993) as fuelling the process leading to the trans-fat ban 10 years later. Following the media coverage of the Lancet's 1993 publication, the sales of margarine reportedly dropped significantly. Danish margarine producers responded to the media concern by investing in technologies which could eliminate or significantly reduce the TFAs contained in their products. Although trans-fat reducing technology had been available for a number of years, it was still expensive, and taking out TFAs also led to quality (mouth feel and melting point) problems for some customers (in particular bakeries). After a couple of years and substantial development costs, the margarine producers solved these problems.

Thus, when the Danish Parliament passed the maximum TFA limit at 2%, the Danish margarine producers already complied with these standards – and hence supported them. The same was true for the Danish suppliers of margarine processing technology; they had been involved in the development of the TFA reduction technology – and they saw export potential in a possible international diffusion of the ban. Enzyme-assisted Interesterification (eg., Lipolase™, which is produced by the Danish company Novozyme A/S), is one of the new alternatives to the traditional – and TFA producing - hydrogenation technologies.

Even though by 2001 TFAs in most margarines produced in Denmark had been reduced to below 1%, there was still a substantial content of trans-fat in a number of processed foods such as cakes, biscuits, crisps and some fast food. The Nutrition Council (Ernæringsrådet, 2001) especially voiced its concern about the health risks among heavy consumers of these products – and recommended the adoption of mandatory standards. An advantage of banning trans fats, as compared to having trans fats listed on nutrition labels, is that the ban covers all types of food and outlet – including food retailers, canteens, restaurants, coffee shops, hospitals, cafeterias, and everything else.

Illustrating the effects of the Danish ban on the catering sector, a study by Stender et al. (2008) found that in New York City a McDonald's serving of large fries and chicken nuggets contained 10.2 grams of TFAs, while the same meal in Denmark contained just 0.33. An unpublished study by the same author assesses, that the current (2010) trans-fat content in margarines in most Western countries is less than 5 % and in Denmark less than 1%. In some less developed countries the content is closer to 35%.

4.2 The United Kingdom: front-runner in government industry action

The UK Government approach to reformulation has emphasised labeling with a view to providing incentives to manufacturers to reformulate to achieve a 'cleaner' label; and setting targets for reformulation and encouraging firms (and trade associations) to sign up to them. There is no logo for use by firms meeting targets, but the Food Standards Agency (FSA) agreed to publish the commitments on its website along with successful case studies.

The Food and Drink Federation (FDF), representing British manufacturers, has supported UK Government initiatives. In 2005 it launched its Food and Health Manifesto, which among other things, presented a commitment towards industry work on "continuing to reduce levels of fat, salt and sugar in products and providing lower fat, lower salt and lower sugar options where technologically possible, safe and acceptable to consumers" (FDF 2005). In 2007, the industrial body set up the Wellbeing Steering Group with the objective to work jointly with Government on solutions to the healthier eating challenges in the UK, including labelling, reformulation, and providing consumer choice (FDF 2010a).

It is estimated that 75% of salt in the diet is found in processed foods, such as bread, ready meals, soups, sauces and savoury snacks (FSA 2009a). Consultation with stakeholders led to the publication of targets for salt levels in a wide range of food products published in March 2006. These were considered to be challenging but achievable. It was agreed to review progress and revise targets through further consultation in 2008 leading to revised 2010 targets for some food categories and further (stricter) targets for 2012. Cost was a consideration. Industry made a series of commitments (published on the FSA web-site in 2005 with update in 2010). 75 organisations have made commitments including all the major retailers whose influence through own-label produce is especially important.

The FSA suggests that reformulation activities in recent years have seen the average amount of salt found in branded pre-packed sliced bread reduced by around one-third; branded breakfast cereals by 44%; top-selling cakes and biscuits 16% to 50%; crisps up to 55%; cooking and pasta sauces 30% (FSA 2009b). Using urinary sodium levels, FSA reports that population intake has fallen from 9.5g of salt in 2000/01 to 8.6g in 2008. Research commissioned by the Food and Drink Federation (FDF 2010a) shows that, according to figures from Kantar Worldpanel, there has been an average reduction between September 2007 and September 2009 of 5.3% in net salt content in 100,000 products bought by UK households (according to information on nutrition labels). Greatest improvements were achieved for the convenience and ready meals sectors (18.75% drop), canned goods (12.1%) and bread and morning goods (8.6%).

The Responsibility Deal (DH, 2011) has seen further pledges to move towards the 2012 targets. DH estimates this will reduce average intake by a further 1g per head. As well as reducing salt in processed foods, DH is working to reduce salt in public sector catering facilities and in restaurant chains.

With respect to trans fats, it was felt that voluntary action by industry before 2003 had been effective at reducing intakes to an acceptable level. They are said to have been relatively easily replaced at minimal cost⁵. The FSA found that “unlike Denmark which identified in 2000/01 very high levels of trans fats in popular foods on the Danish market, voluntary industry action has reduced artificial trans fat levels in food and UK average dietary intakes dramatically” (FSA 2007a). They expressed concern that further reformulation to reduce trans fats should not increase saturated fat levels in food, which are also associated with CHD risk. Reducing average intakes of saturated fat from the current 13.3% to the target 11% of food energy was the stated priority for cardiovascular public health benefits.

Reformulation to remove saturated fats is at an earlier stage than salt and trans fats. FSA adopted a similar approach as for salt, with labelling, consumer awareness campaigns,

⁵ This contrasts with the Danish margarine manufacturers arguing they incurred substantial development costs to overcome technological hurdles. It is probable British manufacturers benefitted from Danish investment.

consultations and publication in March 2010 of voluntary targets for a wide range of processed food products. However saturated fat is complicated compared to salt for technological and consumer reasons. Saturated fat provides an important structural function as well as contributing to the tastes of products. Furthermore, consumer understanding is not well developed: FSA consumer research conducted in May 2007 showed that most consumers do not make the distinction between total fat and saturated fat and are unclear why some fats are needed for a balanced diet.

3.3 Italy: salt reduction is a start

In Italy there is no national legislation on reformulation of foods to remove harmful ingredients. There are, instead, some discussions to develop initiatives to increase the availability of processed foods with reduced salt, or of pastry products without trans-fat. The national strategy is based on institutional alliance with Regions and Municipalities and partnership with food industries, distribution chains and consumers associations. The Ministry of Health has obtained a voluntary agreement with bakers for salt reduction and a voluntary agreement with pastry product producers for elimination of trans-fats.

With respect to salt, priority was given to reduction in bread because data show bread is the principal source and is consumed every day and by all age groups. In Italy the intake of salt is around 10g/person/day, well in excess of the recommended 6g/person/day. In July 2009 the national association of craft bakers signed a voluntary agreement with the Minister of Health to reduce salt content in their products. There are about 30,000 craft bakeries responsible for 90% of bread manufacture, though some large companies, such as Barilla, are also signatories. Conforming manufacturers are allowed to use a “heart friendly” logo and can advertise good nutrition practices. The agreement aimed to reduce salt content in bread by 10-15% by 2011 with further reduction over the following three years and the Ministry of Health is considering the possibility of encouraging salt reduction in other products such as ready meals, frozen foods and some cheese.

3.4 Poland: no Government strategy

In Poland the government has taken no specific actions directly aimed at changing the nutrient content of food products though there are initiatives in which reformulation is a small component.

The *Discover Great Food* programme is a collaborative action with food manufactures and regulators; introduced by the Ministry of Agriculture and Rural Development on 1st May 2004, the Programme was intended to improve the quality and increase the diversity of food. Products which meet the criteria developed by the Scientific Council for Food Products can be awarded the “Discover Great Food” quality mark of which one of the eligibility criteria is to reduce the salt content of food products; but this is only one criterion and the programme is broad enough to include, for example, functional foods.

The Polish salt consensus is a consensus statement and recommendation of Polish experts from various fields of medicine and nutrition, with the aim to reduce salt intake by encouraging food manufacturers to put information about salt content on their products (Stolarz-Skrzypek and Kawecka-Jaszcz, 2009). One of the aims is to reduce salt intake by 16% over 4 years, for all products, food served in restaurants and catering. POL-HEALTH (National Program for Prevention of Overweight and Obesity and Chronic Noncommunicable Diseases) is a programme run by the National Food and Nutrition Institute (a scientific institute). Part of POL-HEALTH targets reduction of salt consumption. Since 2009, specific actions include an assessment of current consumption of salt, analysis of the main sources of salt in food products, and encouraging companies to reformulate. Companies are targeted through the Polish Federation of Food Industry; however, not every company is a member of the federation. Some industry branches are uninterested in the project, mainly because of fear of consumer rejection of the new taste of the product.

Some Polish producers also participate in the international program *Choices*, originally created by Unilever. The Choices Programme, present in Poland since 2008, is called *I know what I choose*. The Choices stamp on foods and drinks means that the products meet qualifying criteria

with respect to trans fatty acids, saturated fat, salt and sugar content. In Poland more than 100 products have received the Choices mark.

In Poland there are products that contain 10-12 g of TFA per 100 g available in the market and Poland is one of the three countries with the highest daily intake of TFA in Europe (Poland, Hungary and the Czech Republic) (Achremowicz and Korus, 2007). Despite this fact there is no legal regulation concerning TFA in Poland, nor any government-industry initiative to reduce levels.

3.5 The EU Platform

In 2005 the European Commission created the EU Platform for Action on Diet, Physical Activity & Health, which brought together a variety of concerned stakeholders and challenged them to respond to the rising tide of obesity in Europe.

Public health NGOs, consumer and physical activity groups, the food, drink and catering industries, and a number of Member States comprise the 32 Platform members, together with observers from the World Health Organisation (WHO) and EFSA (the European Food Safety Authority). The main criterion for membership is that each member must annually propose and commit to specific activities designed to halt and reverse the obesity trend. These commitments must be recorded, and outcomes are monitored and measured and fed back to the Platform. Commitments and pledges by companies have been made in three different forms: by individual companies (Unilever, Mars Inc, FERERRO Group, EROSKI), by trade associations (CIAA, FERCO, EMRA), or by companies/trade associations in partnership with government (UK FSA salt reduction strategy).

Reformulation is one of five fields for action by the Platform Members and reformulation commitments represent 6% of the 292 total commitments. Since the start of the Platform there have been a total of 14 commitments to reformulation. In 2009, there were eight continuing commitments in this area: five by FoodDrinkEurope (formerly CIAA) and its members, one by the European Community of Consumer Cooperatives (EuroCoop) and its members, one by the

European Federation of Contracting Catering Organisations (FERCO) and its members and one by the European Modern Restaurants Association (EMRA) and its members.

5. Findings in relation to the research questions:

5.1 Have reformulation actions been effective and cost-effective?

In terms of commitment of firms and satisfaction of industry, the various approaches to reformulation have been effective. In terms of impact on consumption, they have been less obviously successful, at least for salt. Despite it being the first product to benefit from intensive collaboration between industry and government, and despite 75% of salt intake being through processed foods (in the UK), intake has fallen by only about 10% to 8.6 g in the UK, still well above the target 6g. Other countries have not yet reported effectiveness. Since reformulation was accompanied by an intensive social marketing campaign it is impossible to be sure how much of this reduction was down to reformulation *per se*, or indeed whether there were other entirely unrelated factors responsible.⁶ The Department of Health (DH) is confident intake will fall by a further 1g under new pledges and that further reductions, aided by continuing technological developments, will see intake approaching the 6g target. However, bread is now near to its technical limit in the UK (Berryman, Leatherhead Food RA, *Grocer* debate). For most foods consumer acceptance is the limiting factor, companies' strategy being to reduce salt levels until consumers react negatively, then add a little back (Vermont, CEO McCains foods, *Grocer* debate). Overall, reformulation to remove artificial trans fats has been relatively technically straightforward (at least following initial Danish research investments) at minimal cost and has proceeded smoothly in large companies and in the more developed economies. Population intake levels are well below recommended maxima in both the UK and Denmark. It could therefore be argued that both mandatory and voluntary reformulation policies have been successful. However, Which? claims there remain high levels of trans fats in lower quality

⁶ More rigorous statistical analysis within Eatwell suggests the reduction may be attributed to reformulation and social marketing rather than other factors.

foods⁷ and the Polish study shows high levels of trans fats in some Polish foods and in the Polish diet more generally. At the EU level, Logstrup (interviewee) believes there are still a number of people who substantially exceed recommended intake levels. It appears there may be a tail of consumers with particular diets and of producers of lower quality products (supplying lower income consumers?), for whom the cost of the raw materials is sufficiently important that they continue (legally) to use cheaper ingredients with high levels of TFAs. Consumer groups in the UK and NGOs in the UK and EU therefore support mandatory standards to remove this tail.

Turning to cost effectiveness, standard measures would be cost per QALY gained (or DALY saved) or cost per life year gained. In their impact assessments, the FSA states that “Via blood pressure and CVD analysis it is estimated that a one gram⁸ average salt intake reduction across the UK population yields an annual benefit of 56,660 Quality Adjusted Life Years (QALYs) per year.” In the UK a QALY is valued at around €35,000, so the 1g observed reduction in salt intake if wholly attributed to reformulation is valued at about €2b per year⁹ (this compares favourably to the €8b total annual health care costs of obesity in the UK—reducing obesity by 25% is much more challenging¹⁰).

Estimating reformulation costs is problematic. The FSA has argued that since reformulation is voluntary, it should be considered a commercial decision, therefore costs should not be counted in a social cost-benefit analysis. This is slightly disingenuous since the whole point of government involvement is to pressurise companies to make decisions they would not have taken on a purely commercial basis. Nevertheless, even industry agrees (FDF interview) that much reformulation has simply been undertaken as part of the normal new product development process, so it becomes impossible to disentangle costs purely associated with

⁷ However, SACN (2007) compared population average TFA intake and that of the poorest 2.5% of the population and concluded both were under 2% of energy from trans fats and there were no significant differences.

⁸ The actual quote says 1/3 gram, but clarification with DH is that the number of QALYs refers to a 1g reduction over 3 years.

⁹ It may be argued that, since the route to improved health from both salt and TFA reductions is through CVD reductions, and since CVD deaths in developed countries have been falling sharply, the lives saved from salt and TFA reduction will fall over time.

¹⁰ In fact, QALYs measure the private valuation of health, not just health care costs. One may argue that if people choose to eat salt it is because they are willing to take the risk of being ill in the future for the sake of pleasure now--so it is wrong to value the private benefits of the policy, only the health care costs, born by society, should be considered. Such philosophical matters are beyond the scope of this paper.

government pressure¹¹. Investments to reformulate can be substantial, for example Mars UK estimates saturated fat reduction cost in its chocolate bars at €10m (FDF 2009). PepsiCo's switch to healthier sunflower oil technology has meant a cumulative increase of oil costs of €55m between 2004 and 2008 (Pepsico 2010). An important part of the reduction in saturated fats has been achieved through switching oil sources or using blended oil products (Baking Management 2006).

Despite uncertainty over the costs, given the stated magnitude of the benefits, at least with respect to salt, it is inconceivable that the social benefit-cost ratio is not favourable to reformulation.

5.2 Is collaborative action between government and industry more likely to be effective than industry acting alone?

Unanimously the experts interviewed, representing both industry and policy makers, agreed this to be the case. Hunt (FDF interviewee) put it most cogently. He argued there are three important levers that encourage firms to act:

- Consumer pull (any change has to be in conformity with demand trends and consumer concerns)
- Competitive pressure (if one company acts then others feel obliged to follow—particularly where ethical matters are concerned)
- Public policy pressure

Thus if government is pushing and publicising an agenda which is important to consumers and other NGOs), leading firms respond to gain a competitive advantage; others then follow suit. Food retailers too are important in this respect and the major chains have been at the forefront in pushing healthy reformulation among their own-label suppliers. One of the reasons

¹¹ Of course where standards are mandatory, there would be a good case for attributing the full industry costs of reformulation to the policy.

companies reformulate, even if they don't advertise it, is Corporate Social Responsibility (CSR) and the maintenance and enhancement of brand reputation¹².

In Denmark, regulation for trans fats was facilitated by an aligned interest among Danish stakeholders in the legislative process—regulators, manufacturers and their suppliers (who saw the potential for first mover advantage) and consumer associations were all in favour. Scepticism towards European food safety legislation may have contributed (Halkier and Holm, 2006).

The Evaluation Report of the European Platform (European Commission, 2010) argues that “countries where industry has taken the most action are countries where the government had specified they should take action” (p19).

Spanou (DG Sanco interview), believes that the Commission's involvement in the question of food reformulation has been important. She estimates the European food and drinks industry to be sensible and responsible enough to improve the nutritional quality of their products even without the involvement of the Commission but the Commission's engagement has meant clear and common directions to the industry on which way to go. The Commission further hosts knowledge and expertise which is valuable for the industry and it brings in the national element to the discussions and efforts at the European level. This means that the Commission's involvement has given an added value and has probably enhanced the efforts of the industry and Member States. Further, Susanne Logstrup (EHN interview) is not convinced the food and drinks industry would act on its own without being prompted to reformulate their products.

A question this research has not really addressed is the role and importance of labelling in encouraging reformulation. Some countries have adopted this approach (Poland, Italy, but also France and, internationally, private initiatives like Choices); others (e.g. UK) have taken the view that access to a logo will not ensure broad-based reformulation. In Europe, most food producers have chosen not to communicate their efforts to reduce TFAs or salt.

¹² As Hunt (FDF) says, going along with the momentum generated by consumers and government means you keep the NGOs from coming after you.

5.3 Are there circumstances under which legislation is preferable to voluntary action?

The European Platform evaluation (EC 2010) reaches the conclusion that: “there is consensus on the need to define national standards for recommended levels of salt, sugar, trans fats and saturated fats in consumer products, taking into account national eating patterns. However, there is no real consensus on whether these should be mandatory or simply recommended levels.” (p42).

Among our interviewees there was a similar lack of consensus. The dominant view was that voluntary reformulation works most cost-effectively. Mandatory reformulation would be complicated and very expensive to enforce (“who would be responsible for monitoring and testing?” Hunt FDF interview). Furthermore, voluntary targets can be made progressively more difficult to achieve over time (in the UK, DH argues this should be the case, though it recognizes that industry complains that the goal-posts keep shifting).

Policy makers also argued that creating regulations is time consuming and onerous and is better seen as a last resort if voluntary approaches fail. At European level, the complexity of reformulation legislation arises from the fact that food production is so diverse. In order to introduce regulatory measures, the European Commission would need to consider how each part of the EU could address the issues related to reformulation, which would be a lengthy and complicated task. However, the implicit threat of regulation is a motivator for industry action (even though under EU rules it would be difficult for Nations to legislate unilaterally).

Targets in the UK exist for maximum and average levels of nutrients. Mandatory regulation could only target maximum levels. Where better progress has already been made, mandatory targets could see firms increasing levels (DH). Furthermore, some foods would need to be removed from the market place, limiting consumer choice.

It can also be argued that the voluntary approach ensures more efficient resource allocation in the sense that the easier (less costly) actions are taken first. A mandatory approach would find it difficult to set achievable (and cost-effective) targets for all products—and would therefore waste resources by forcing actions where marginal social costs outweigh marginal social

benefits. This is similar to the point made by Segerson & Miceli (1997) that voluntary agreements provide firms with greater flexibility to exploit company expertise and stimulate innovation. The same argument is made at the European level with respect to Member States: Different Member States face different challenges; in some countries the problem might be too high a proportion of fats in the diet, in others portion sizes might be a major issue and that is the reason the European Commission has chosen to work with the different Member States to find the appropriate solutions and goals for each of them.

The alternative view is that mandatory rules force faster reformulation, but more importantly, ensure that 'rules' are applied to all products, not just those of firms making commitments. There is a suspicion that suppliers of poorer quality (cheaper) foods don't feel a need to reformulate. The Nutrition Council in Denmark (Ernæringsrådet, 2001) especially voiced its concern about the health risks among heavy consumers of products with higher levels of TFAs and the Consumers' Association in the UK also expresses concern. Susanne Logstrup, (EHN), believes small and medium sized companies might overestimate the investment required to develop new recipes, and adapt production processes, machinery, packaging and labels.

Trans fat levels in Poland are too high and there was a view that legislation on mandatory standards would be helpful. The Polish policy maker (Stoś interview) noted that unpopular mandatory rules can, over time, become accepted ("obligatory iodization of kitchen salt to eliminate the risk of iodine deficiency in our population had many opponents but finally it brought considerable health benefits. It is for sure easier to monitor such actions.")

5.4 Are there benefits to European as opposed to separate Member State action?

There was widespread concern in the UK, Denmark and among EU Platform members that mandatory EU level standards were inappropriate because any standard would be a compromise with a tendency to be set at levels that were worse than those already achieved by voluntary means. Moreover it was believed that it would take a very long time to agree formal EU standards (European Commission 2010).

Polish stakeholders were less sure, seeing the EU as a possible solution to limited domestic inactivity. It might be argued more generally that EU input is more important to Member States with less advanced nutrition surveillance systems themselves.

5.5 The nature of competition

Large manufacturers view reformulation as part of the competitive process and an important element of corporate social responsibility. Countries with concentrated food industries (e.g. UK and Denmark) are more likely to see significant reformulation activity than where SMEs predominate (e.g. Italy and Poland). It is also evident that food retailers play an important role in encouraging reformulation in their private label suppliers, who are often smaller companies. The competitive nature of the retail industry and the importance of private label varies widely through the EU—those with large chains who compete on the basis of quality as well as price and use private label as a component of their inter-firm competitive strategy are most likely to see wide-spread reformulation. In the US, Walmart has announced it will remove all remaining industrially produced TFAs by 2015 (Walmart, 2011).

A continuing concern is that reformulation actively disadvantages SMEs, particularly if they don't possess the technological capacity for the necessary NPD (technologically sophisticated and requiring R&D). However, government and industry in the UK argue that the Research Associations (RAs—Campden BRI and Leatherhead Food Research primarily) provide this service—many of their members are SMEs and they are technologically highly sophisticated organisations (FDF). The Government co-financed 6 Regional Food Technology Transfer Centres¹³ are also important. It is not clear whether a similar service is accessible to firms in all other Member States, though the British Food RAs nowadays position themselves as global operators—Leatherhead claims 1500 member companies world-wide and Campden claims 1600 from 60 countries.

¹³ RFTTCs act as a single point of contact for small and medium-sized regional food companies with food related technical needs. Through links with universities, relevant government agencies and local industry, the RFTTCs act to stimulate increased awareness and uptake of innovative food technology. Each of the six centres offer a differing range of services (<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=4193#Description>)

6. Discussion

This paper presents findings from qualitative research in 4 EU countries and at the EU level; it cannot claim to be comprehensive, but its findings may be considered indicative of wider issues in the EU. Perhaps inevitably the work doesn't provide a definitive answer to many of the questions it set out to investigate, but it does shed light on the issues that should be addressed and the questions that should be asked by policy makers in member States and the EU.

We find quite conclusively that reformulation, whereby industry acts in collaboration with and in response to government pressure, works. 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. Firms 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. The system of visible commitments seems to work well; as suggested by traditional and behavioural economics, public commitment (by firms, individuals or governments) influences behavior.

Several questions remain unclear on the basis of this research. We do not know whether access to the use of a logo as a reward, and visible sign of compliance, is favourable to a more rapid pace of reformulation, though the negatives appear to outweigh the positives. There are already an abundance of labels and consumers' interest and capacity to grasp the nuances of the distinctions among them is reaching saturation point. Already there are labels for nutrition (front and back of pack), ingredients, health and nutrition claims, animal friendly, fair trade, organic, free range, traceability, carbon footprint, PDI/PDO etc etc. Labels are intended to enable consumers to make informed choices, but this can only work if consumers understand (and care about) the information they are provided. The situation has reached a stage that there have even been calls for a single omni-label, encompassing all these aspects of 'quality' to avoid further proliferation of labels (e.g. The Times, 2008). A second argument against labels is the cost to government of monitoring their use. But perhaps most tellingly, the desire to see reformulation permeate the entire food supply argues against the use of a label/logo which is used by a select few companies to differentiate and market their products.

This gives rise to a second unanswered question, whether reformulation can achieve substantial rather than marginal improvements in diets. The case of trans fats suggests it can, at least in some circumstances. Population intakes in both the UK and Denmark have fallen to well below recommended safe maxima, but this may be a special case because there were few technological barriers, additional costs were minimal and consumers never consciously chose trans fats or were aware (sensorially) of their removal. The same cannot be said of salt which, for some foods plays important functional, preservative and sensory roles. It is worth remembering that products already exist (such as those with the *Choices* logo) that would enable people to reduce their intakes below 6g per day if they wished.

Our study has not been able to pay much attention to saturated fats because there has been little reformulation activity to date, but this is because the technological and consumer barriers are even higher than for salt¹⁴.

Only the UK appears to have made an attempt to evaluate cost effectiveness, though their approach pre-judges the outcome. The cost side of the equation is very small because, it is argued, reformulation is voluntary and therefore a commercial decision. The benefit side is huge both because the number of lives saved and QALYs gained is large and because QALYs are valued at a level which includes private benefits, whereas it may be better only to value the social benefits of intervention—as with obesity, the health care costs are the most important of these. If directly compared, the calculations imply that the benefits from a 1g reduction in salt intake is equivalent to the benefits from 25% of the population who are overweight or obese shedding all their surplus kilos. Nevertheless we accept that many reformulation costs are commercial and the value of the benefits to health are considerable, so it seems certain the measures taken have been cost effective.

¹⁴ We should recognize there has been a long term downward trend in saturated fat intakes in richer EU countries from around 15% in the 1960s to 12-13% now (Schmidhuber and Traill, 2006) as people's diets have moved away from full fat dairy products and red meats, and a continuation of this trend may ultimately eliminate the need for saturated fat reformulation.

Whether mandatory standards of the Danish trans fat type would achieve more than voluntary measures also remains uncertain. Clearly policy makers and food manufacturers in the UK and the EU don't think so; they argue compulsory standards would be slow, cumbersome, costly, and may even increase levels of salt and trans fats in some foods because standards could only set maximum levels, which many firms already better. However, NGOs believe too many foods, produced by the some of the vast number of firms who haven't made formal commitments, still contain too high levels of salt and trans fats, and that these foods are relatively poor quality and cheaper, and hence consumed most by poorer consumers, and consumers in countries with less well developed food control systems. They believe mandatory standards are the best way to make sure all food is 'good' food. Some policy makers in Poland are in agreement, as indeed they must be in Austria, Switzerland and Iceland which have followed the Danish ban. 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 is beyond the authors' capabilities—but we believe the issue deserves further attention. If so, this would probably need to be undertaken at the European rather than Member State level to avoid contravening EU food law.

The impact of reformulation on competition, particularly its impact on SMEs, is a further concern of NGOs and some governments. Our study suggests this need not be a problem provided such firms have access to technological assistance. Many firms are members of trade associations which provide their members with such help, others supply private label products to retailers who are important in providing the incentive and know-how to meet target nutrient levels. Others still are members of food research associations. Inevitably not all firms have access to any of these information sources and National governments may feel it their duty to assist such firms.

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Appendix: Interviewees

Denmark

- Steen Stender (Gentofte Hospital, previously the Danish Nutrition Council)
- Morten Strunge Meyer (Danish Cancer Research)
- Anders Mølbak Jensen (Palsgaard, previously VM Margarine)
- Hans Christian Holm, (Novozymes)
- Frederik Madsen (MIFU, the Danish Association of Margarine Producers)
- Marian Fischer Boel (Former EU Commissioner for Agriculture and Danish Minister of Food)
- Katrin Kuhnt, (Ernaerungswissenschaftlerin) Institut für Ernährungswissenschaften, Universität Jena, Germany
- Ed Fern, Nestle Head of Corporate Nutrition

Italy:

- Daniela Galeone, Director of Planning and control, Department for Prevention and Communication of the Ministry of Health;
- Luca Scalfi, Professor of Human Nutrition, University of Naples, member of the Committee for salt reduction in food of the Ministry of Health;
- Andrea Ghiselli, Director of Communication and Education Unit, INRAN, member of the Committee on Diet and Nutrition of Ministry of Health.
- Letizia Balducci, Nestlé, IR& Manufactory Manager Italian Market (in charge of Products' development, industrialization and optimization for Nestlé Italy);
- Patrizia Silvi, Unilever, Responsible of the Nutrition and Health Department for Unilever Italy;

- Federico Ghirelli, Colussi,, Responsible of the Quality Assurance and R&D Department.

Poland

dr. Katarzyna Stoś, head of Department of Safety of Food and Nutrition in the National Food and Nutrition Institute.

Deputy Manager of the Marketing Department and for 3 years contact person for program "I know what I choose" (WCW) in FROSTA.

United Kingdom

Julian Hunt, Communications Director, Food and Drink Federation

Dr Corinne Vaughan, Nutrition Strategy Team, Department of Health

Derrick Jones, head of Analysis and Research Division

Sarah Church, Deputy Director Food Policy Unit, Department for the Environment, Food and Rural Affairs

Presentations and Discussion with participants at Conference on Reformulation, Central Hall, Westminster, London, *The Grocer Food and Health Debate 2/2/11*.

EU

Despina Spanou, Principal Adviser for Policy and Communication Coordination at DG SANCO

Susanne Logstrup, Director of the European Heart Network (EHN)

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