World Health Organization

stop
Science and Technology in childhood Obesity Policy

FOOD SYSTEMS FOR HEALTH

REFORMULATION OF FOOD AND BEVERAGE PRODUCTS FOR HEALTHIER DIETS: POLICY BRIEF

Foods that are energy dense and nutrient poor are widely available, whether bought from retailers, takeaways or deliveries, or eaten at restaurants that are supplied by food manufactures. As a result, many people are eating large amounts of food high in fat, sugars and salt/sodium *(1)*; this contributes to unhealthy diets, which currently cause 8 million premature deaths globally every year *(2)*. In recent years, policy-makers have increasingly recognized that actions are needed to make the supply of foods and the food environment healthier, in addition to increasing knowledge and providing information to educate consumers.

Measures are required to eliminate industrially produced *trans*-fatty acids (TFA) from the food supply, reduce the energy content per portion and lower the levels of saturated fats (SFA), sugars and salt/sodium in food. Food reformulation policies are an important part of a suite of policy actions to support healthy and sustainable diets. It can contribute to ensuring access to safe and nutritious food for all, and shifting towards healthier and sustainable consumption patterns, because individuals do not need to change what they buy or make a conscious effort to seek healthier options.

Food reformulation is the process of altering the processing or composition of a food or beverage product, to improve its nutritional profile or to reduce its content of ingredients or nutrients of concern *(3)*. Reformulation of processed food can lead to products with a healthier profile; however, reformulation does not eliminate the concern for high consumption levels of highly processed foods. Therefore, consumption of fresh and home-prepared foods, ideally locally produced, should be prioritized over consumption of highly processed foods, including reformulated products.

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A recent review on the impact of food reformulation on food choices, nutrient intake and health status *(4)* was conducted as part of the STOP project. The review indicated the following:

- People usually accept, buy and consume reformulated products, resulting in an overall improvement in the nutritional composition of food purchases. Salt reduction in particular has higher acceptance by consumers.
- Overall, food reformulation tends to lead to improved nutritional intakes. Analysing studies from Europe and the United States of America (USA), the review found that daily population-wide salt intake after reformulation was 0.57 g lower than before. Similarly, product reformulation to reduce TFA content results in reduced TFA intake; for example, an overall decrease in intake of 38–85% was reported in Costa Rica, North America and the United Kingdom of Great Britain and Northern Ireland (United Kingdom).
- After limiting industrially produced TFA, or banning partially hydrogenated oils (PHO) in processed and restaurant foods, there was a reduction of 4.3–6.2% in mortality from cardiovascular disease (CVD) in Austria, Denmark, Costa Rica and the US. One British study on sodium reduction in foods showed a positive effect on blood pressure. The three studies that investigated the effect of reformulation on children and adolescents found similar results to those seen in adults.

ABOUT WHO'S FOOD SYSTEMS FOR HEALTH

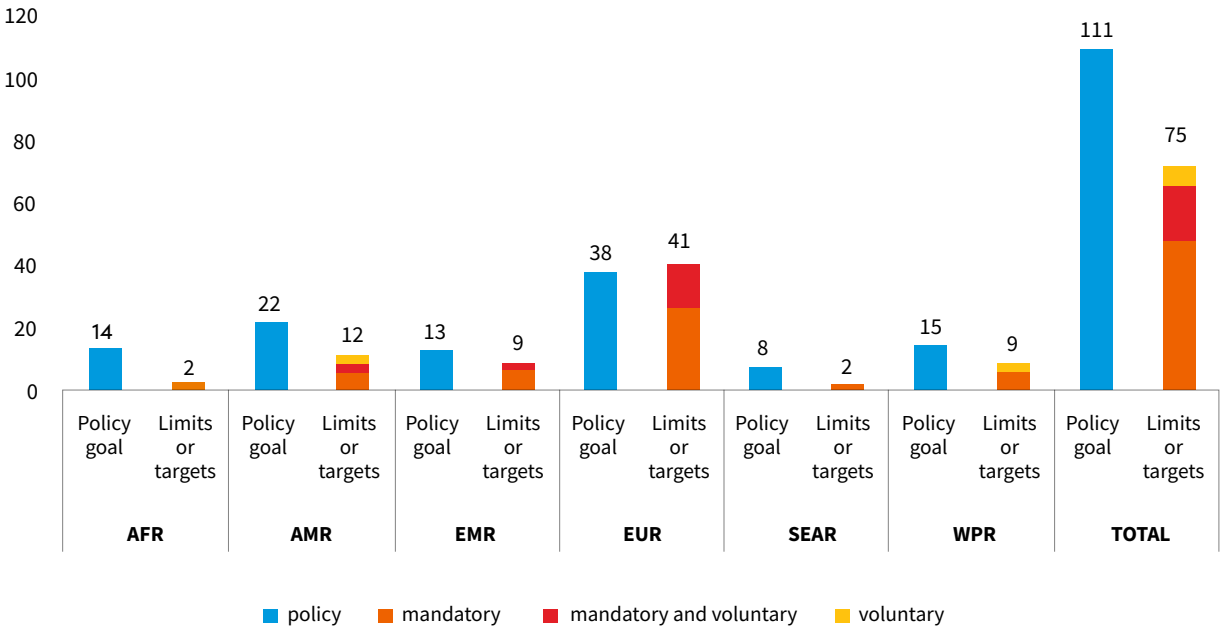
Today's food systems are simply failing to deliver healthy diets for all. In addition to the suffering this causes to individuals and families, the economic costs to society due to the health and environmental impacts of current dietary patterns are heavy, and often hidden. If food systems are transformed, they can become a powerful driving force towards ending hunger, food insecurity and malnutrition in all its forms. There is no single solution, instead it is recommended to implement coherent portfolios of policies, investments and legislation that prioritise health. At the same time, it is also important to ensure a fair price for the producer and reflect the true environmental, health and poverty costs.

WHO's Food Systems for Health narrative highlights five different ways in which food systems impact on health and embraces the interconnectedness of humans, animals, and the planet (9). The malnutrition pathway comprises the aspects of food systems that lead to unhealthy diets or food insecurity and therefore contribute to malnutrition in all its forms. Malnutrition and hunger pose the highest risks to human health in terms of death and illness and include obesity, micronutrient deficiencies, stunting, wasting, communicable and noncommunicable diseases and mental illness.

Increasingly, countries are introducing legislation to eliminate industrially produced TFA *(5)*, and there is growing momentum for implementation of reformulation programmes, particularly to reduce salt/sodium *(6)*. Nonetheless, levels of unhealthy fats, sugars and salt/sodium remain too high in many products. There is an urgent need for accelerated regulatory action on TFA elimination and salt/sodium reduction, and more ambitious and wide-ranging reformulation programmes, including those to address sugars, SFA, energy and portion sizes, and restaurant, takeaway and home delivery food. Countries have committed to acting to promote healthy diets and addressing malnutrition in all its forms *(7-9)*. The Framework of Action (from the Second International Conference on Nutrition, held in 2014) recommends "encouraging gradual reduction of SFA, sugars and salt/sodium and *trans* fat from foods and beverages" *(10)*.

According to the World Health Organization (WHO) Global database on the implementation of Nutrition Actions (GINA), 111 countries have national policies, strategies and plans to implement food reformulation. Moreover, 75 countries have set mandatory limits or voluntary reformulation targets. Of these countries, 70 have set mandatory limits (21 of these countries also have voluntary targets) whereas five have voluntary targets only (Fig. 1). Many countries have set a policy goal to stimulate reformulation rather than adopting mandatory limits or voluntary targets for reformulation. Among the countries that have set one or more mandatory limits, these are most commonly for industrially produced TFA. In the WHO European Region, the European Union (EU) TFA regulation is driving a higher number of countries to establish targets or limits. Only a few countries in the African Region and South-East Asia Region, and less than a third of countries in the Western Pacific Region implement mandatory limits or voluntary targets.

Figure 1. **Policy goals and measures with mandatory limits and/or voluntary targets by WHO region. Mandatory limits mean the country has one or more mandatory limit for unhealthy fats, sugars or sodium**

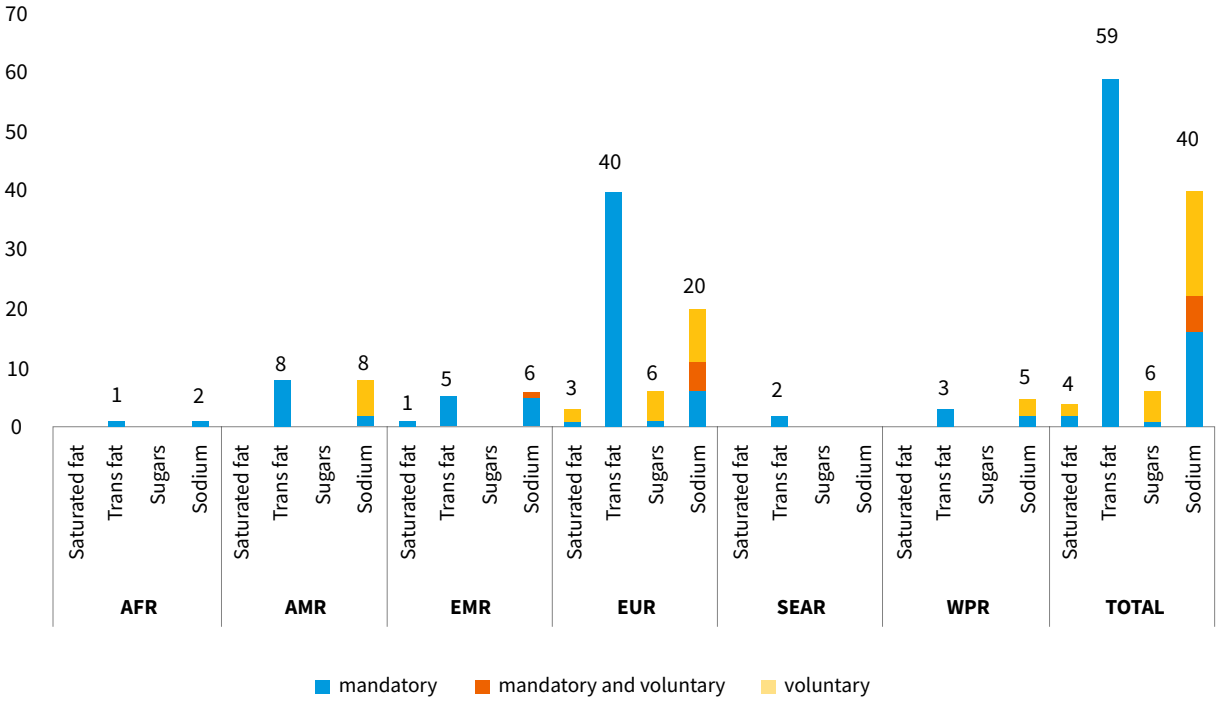


AFR: WHO African Region; AMR: WHO Region of the Americas; EMR: WHO Eastern Mediterranean Region; EUR: WHO European Region: SEAR: WHO South-East Asia Region; WPR: WHO Western Pacific Region; WHO: World Health Organization.

Source: WHO Global database on the Implementation of Nutrition Action (GINA)

Elimination of industrially produced TFA from the food supply is a low-cost policy measure that has significant long-term health benefits. Similarly, it is feasible to set maximum limits for the amount of salt/sodium in different food categories and reformulate them accordingly, to reduce salt/sodium intake. Both are recommended as effective interventions to reduce unhealthy diets and tackle noncommunicable diseases (NCD) *(11)*. Countries have also taken action to reduce SFA and sugars in selected products (e.g. milk or dairy products with reduced fat, and beverages with reduced sugars levels), although these are less often assigned set limits or targets in national policies. Fig. 2 provides a 2022 snapshot of the distribution of mandatory or voluntary approaches to reformulation for each of the nutrients of concern within the WHO regions. Elimination of industrially produced TFA has progressed the furthest, with 61 countries implementing mandatory limits globally. Sodium reformulation is also implemented by 47 countries, half of which are in the WHO European Region.

Figure 2. **Mandatory limits or voluntary targets by nutrient and WHO region**



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Source: WHO Global database on the Implementation of Nutrition Action (GINA).

WHY IMPLEMENT PRODUCT REFORMULATION POLICIES?

The purpose of implementing food and beverage product reformulation policies is to deliver benefits for public health, individuals and businesses:

- **Public health:** By reducing excessive consumption of unhealthy fats, sugars or salt/sodium from processed food products, individuals and populations improve their diets; in turn, this reduces the risk of diet-related NCDs, disability and death, benefitting all socioeconomic groups.
- **Individuals:** Reformulation improves the nutrient quality of foods and helps individuals to consume healthier diets.
- **Businesses:** Reformulation targets or limits create a level-playing field across the food-processing sector. Although there may be an initial investment in reformulation, developing products with a better nutrition profile offers businesses the opportunity to improve their brand and reach more consumers interested in their health. These products may also avoid being subject to taxation measures aimed at unhealthy products and may face fewer marketing restrictions and trade barriers.

Eliminating industrially produced TFA from the food supply

High intakes of industrially produced TFA are strongly associated with increased risk of coronary heart disease (CHD), and TFA intake is estimated to be responsible for hundreds of thousands CVD deaths globally every year *(12)*. WHO recommends reducing the intake of TFA to less than 1% of the total energy intake, and using unsaturated fatty acids as a replacement *(13)*. Elimination of industrially produced TFA is feasible and achievable – several countries have virtually eliminated industrially produced TFA from their food supply *(12)*.

WHO recommends that countries implement either of the two best-practice policies: a mandatory national limit of 2 g of industrially produced TFA per 100 g of total fat in all foods; and a mandatory national ban on the production or use of PHO as an ingredient in all foods *(14)*.

The WHO-recommended best-practice policies can virtually remove industrially produced TFA from the food supply. This can be done without increasing levels of SFA *(14)*, while reducing TFA intake at the population level *(15-17)*.

National or local policies that have succeeded in reducing industrially produced TFA intakes have led to favourable changes in population's lipid profiles *(18, 19)*, and have reduced the prevalence of stroke *(20)* and CVD deaths *(21, 22)*. In 2021, best-practice TFA policies had come into effect in 40 countries (covering 1.4 billion people) and six further countries had passed a best-practice TFA policy that will come into effect in the next two years (covering an additional 1.7 billion people); in combination, these policies will cover about 3.1 billion people *(23)*. To eliminate industrially produced TFA, governments and industry, including suppliers of oils and fats, need to accelerate action.

PUBLIC HEALTH IMPACT OF DENMARK'S GROUND-BREAKING TFA LEGISLATION

In 2003, Denmark became the first country in the world to regulate the TFA content of food products. The legislation came into force in January 2004 and almost eliminated industrially produced TFA from the country's food supply. Before 2003, trends in the prevalence of CVD deaths in Denmark were similar to those in other Organisation for Economic Co-operation and Development (OECD) countries. In 2007, cardiovascular mortality rates decreased on average by 14 deaths per 100 000 people per year compared with the populations of other OECD countries *(21)*.

Reformulation to reduce the amount of salt/sodium in processed food

Excessive intake of salt/sodium increases blood pressure and is associated with a higher risk of CVDs, including stroke and deaths from CHD *(24)*. It is estimated that high salt/sodium intake is responsible for 3 million deaths globally every year *(25)*. Reducing salt/sodium intake is an effective way to lower blood pressure and thus to reduce CVDs and related conditions *(26)*. WHO recommends a reduction to less than 2 g/day sodium (5 g/day salt) in adults *(26)*. In 2013, the World Health Assembly adopted a global target of a 30% reduction in mean population intake of salt/sodium by 2025 *(27)*, but the world is not currently on track to meet this goal *(28)*.

In many high-income countries, and increasingly in low- and middle-income countries, a significant proportion of the salt/sodium in the diet comes from manufactured foods such as bread, cereal and grains, processed meats and dairy products *(29)*. An effective way to reduce population salt/sodium intake is through lowering the sodium content of foods that are consumed frequently and therefore contribute to a high intake of this nutrient.

Country experience suggests that setting well-designed reformulation targets can lead to considerable progress in reducing salt/sodium levels in foods *(30, 31)* and population salt/sodium intakes *(4, 30-32)*. At least 17 countries have reported reductions in population salt intake, with 12 countries reporting a substantial (>2 g/day) or moderate (1–2 g/day) decrease *(32)*.

Many countries have implemented a stepwise approach by setting a series of progressively more ambitious targets for reformulation. Mandatory reformulation appears to achieve larger reductions in population-wide salt consumption than other interventions such as voluntary reformulation, school interventions, short-term dietary advice and nutrition labelling *(31)*. Reformulation of food products to reduce salt/sodium levels is estimated to be a cost-effective strategy in countries of all income levels *(11, 33)*. Current reformulation efforts, however, have been inconsistent in terms of measures adopted, food product categories targeted and level of the limits or targets; hence, such efforts have not yet fulfilled their potential. To drive progress on this issue

GLOBAL SODIUM BENCHMARKS *(34)*

To accelerate progress on sodium reduction — and recognizing that the setting of appropriate national sodium targets is a highly complex, technical issue — WHO has established a set of global benchmarks for a wide range of food categories *(35)*. The benchmarks were developed through consultation with experts and were informed by data collected on sodium targets set in 41 countries, one WHO region and one WHO subregion. Benchmarks are defined as maximum targets of sodium (in mg per 100 g/mL) for specific subcategories of food; in principle, they are based on the lowest value for each subcategory from existing national or regional targets. These benchmarks are intended to complement existing national and regional efforts and initiatives, and to serve as a reference for such initiatives.

The following countries and territories have set mandatory salt/sodium limits for various foods, such as bread, cereal products, processed meats, cheeses, crisps and snacks, soups and stocks, or tomato products: Argentina, Austria, Bahrain, Belgium, Bulgaria, Colombia, Croatia, Greece, Hungary, Iran (Islamic Republic of), Iraq, Jordan, Kiribati, Latvia, Malaysia, Mauritius, Montenegro, the Netherlands, Oman, Paraguay, Portugal, Saudi Arabia, Slovakia, South Africa, Spain, Uzbekistan and the occupied Palestinian territory, including east Jerusalem.

Reformulation to reduce levels of sugars in foods and beverages

WHO recommends limiting intake of free sugars[1] to less than 10% of total energy intake, and suggests a further reduction in the intake of free sugars to below 5% of total energy intake *(35)*. Given the success with incremental reductions in salt/sodium levels through government-led reformulation programmes, a growing number of national authorities are applying the same approach to sugars reduction and have set targets for sugars levels in different food and beverage categories. Modelling studies predict reductions in energy intake from reformulation of sugar-sweetened beverages and sugar-dense foods, and predict associated health benefits *(36)*. Results from the limited trials available to date suggest that consumption of sugar-reformulated products for 8–10 weeks can reduce sugars intake by around 12% and result in average weight loss of 1 kg *(37)*.

The evidence base from real world experience of government-led initiatives for reducing sugars in foods is less well developed, but some modest to large reductions in sugars levels across the food supply have already been seen *(38)*. Other policy levers, such as taxation or nutrition labelling, can help to drive reformulation efforts. For example, following the introduction of a soft drink industry levy in the United Kingdom, the proportion of potentially taxable drinks with sugars levels above the lower levy threshold (5 g sugars 100 mL) fell by 34 percentage points, suggesting that the levy had incentivized manufacturers to reformulate their products *(39)*. There was a 43.7% reduction in the total sugar content per 100ml between 2015 and 2019 for the drinks subject to the levy, and the total sugar purchased per household from drinks subject to the levy has also decreased across all socio-economic groups (between 32.7% and 38.5% reduction) *(38)*.

[1] Free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.

REFORMULATION TARGETS FOR SODIUM, SUGARS AND SFA IN AUSTRALIA

Launched in 2020, Australia's Healthy Food Partnership Reformulation Program has established voluntary reformulation targets for sodium, sugars and SFA *(40)*. In 2021, targets for the maximum level of sugars were issued for breakfast cereals, flavoured milk, muesli and snack bars, non-alcoholic beverages and sweetened yoghurt, to be achieved by June 2025 or 2026, depending on the food category. SFA targets were set for sausages and savoury pastries *(40)*.

Reformulation to reduce SFA levels in food

Reduced intake of SFA is associated with a significant reduction in risk of CVD when the SFA are replaced with unsaturated fats. WHO suggests reducing the intake of SFA to less than 10% of total energy intake *(13)*. Updated WHO guidelines suggest using polyunsaturated fatty acids as a source of replacement when reducing the intake of SFA. SFA can be replaced also by monounsaturated fatty acids from plant sources, or carbohydrates from whole grains, vegetables, fruits and pulses *(41)*. Also, modelling studies and country experience suggest that reformulation could reduce SFA consumption with a potential impact on NCD deaths *(36)*. Reformulation programmes need to be carefully designed to ensure that reduction of SFA levels does not lead to replacement with other nutrients of public health concern, such as free sugars.

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FINLAND'S LONG-TERM EFFORTS TO REDUCE SFA INTAKES AND LEVELS IN FOOD

Public concern about high rates of CVD deaths among young men in Finland in the 1970s was the catalyst for the famous North Karelia project — later extended across Finland — which led to reductions in SFA intakes, blood cholesterol and ran 80% reduction in CVD deaths among people of working age *(42)*. As part of this project, engagement with the Finnish food industry resulted in reductions in levels of total fat or SFA (or both) in a range of foods *(43)*. More recently, the Finnish Food Authority has been encouraging the food industry to issue nutrition commitments – including on quality of fats – as part of the country's operational commitments for sustainable development. Priority food groups for reformulation to reduce SFA or TFA include dairy products, cheese, convenience foods, meat products, spreads and bakery products *(44)*. One condition is that reducing SFA should not lead to a higher content of *trans*-fats, or added sugar, salt or energy.

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Portion size and energy

Portion sizes of processed food have increased over recent decades in many settings *(45)*. Adults and children consistently consume more food and beverages when offered larger sized portions, packages or tableware *(45, 46)*. Sustained reductions may be effective to reduce average daily consumption of energy *(45)*.

Limiting portion and package size to reduce energy intake and the risk of overweight/obesity is also a WHO-recommended intervention *(11)*. Reducing portion sizes may also contribute to reducing intakes of sugars, salt and SFA. For example, modelling studies predict that measures to limit portion size of sugar-sweetened beverages would generate substantial health benefits and long-term cost savings *(47, 48)*.

ENERGY REDUCTION PROGRAMME IN THE UNITED KINGDOM, BUILDING ON SUCCESSFUL SALT REDUCTION PROGRAMME

The United Kingdom launched a successful salt reduction programme that has set five waves of progressively more stringent sodium targets since 2004, leading to reductions of up to 45% in sodium levels in some products and a 15% drop in population salt intakes *(49, 50)*. Alongside this programme, the United Kingdom aims to reduce the calories in a range of everyday foods consumed by children. In 2020, Public Health England set out the calorie reduction ambitions for different food sectors to achieve by 2024 – a 10% reduction in most manufactured foods and a 20% reduction for most categories in the eating out, takeaway and delivery sector – and published guidelines for the levels of energy in different food categories *(51)*.

Reformulation and food safety

Reducing the fats, sugars and salt/sodium in food often implies changing the way the food is processed or the amount or type of ingredients it contains. When these modifications are gradual, they do not impact the physicochemical and sensorial characteristics of the food or consumer acceptance in the short term. However, they may affect the label requirements and food safety *(52)*.

Sugars (e.g. sucrose) and salt (sodium chloride) trap water, which diminishes the water available for the growth of microorganisms, including pathogens. Salt is traditionally an essential ingredient in preservation methods, and even at low concentrations it inhibits the development of microorganisms and some pathogens. Adequate measures can be put in place to preserve food safety while reducing salt and sugars.

Reformulation to reduce energy density by replacing sugars or fats incorporates new ingredients into the food, potentially affecting their safety. Ingredients from novel sources or the same ingredients from different extraction processes or applied in a separate step in the processing can incorporate allergens and introduce physical, chemical or biological risks that were absent from the original formulation *(53)*. Food safety should therefore be an element to consider in reformulation policies, but it should not be considered an obstacle towards it.