



Dietary patterns, Food Reformulation & Sustainability: The triad for public health

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Overview

- Dietary patterns: a complex food – nutrient matrix that influences health
 - Contain Health Benefits & Health Risks
- Food Reformulations
 - Policies
 - Food industry initiative following consumer needs
- Sustainability
 - Supporting environment for dietary choices
 - Dietary choices to support the environment

American Heart Association, Guidelines

- Emphasis on healthy dietary patterns
 - Mediterranean diet
 - DASH
 - Vegetarian style
- Creation of supportive environments for adoption of these

Food Reformulations

- The process of redesigning processed foods to make them healthier
 - often considered a crucial step to help decrease chronic disease prevalence
- Food the main modifiable variable used used to create a Nutritional supportive "environment" for public health. Can be:
 - Mandatory, as per policies
 - Voluntarily derived from food manufacturers

Mandatory Food Reformulations

- Dietary choices influence health
 - Macro-nutrients
 - Micronutrients
- Risk assessment performed in regular intervals by scientific panels EFSA to summarize “evidence” for such policies

Katan, Zock & Mensink:
trans \neq cis
unsaturated fats



1990

Position paper by American
Society for Clinical Nutrition &
American Institute of Nutrition:
insufficient evidence of TFA on
CHD



1995

Publication of
Clinical trial results
effects of TFA's



1995

ESC: TFA have
detrimental effects on
heart health



2015

WHO: TFA
elimination
program



2018...

**2019:
European
Commission
Regulation Act**



ESC: Trans Fats Not Safe For Consumption



TFA's have a detrimental effect on heart health and mortality: Sun, 19 Jul 2015

The primary source of artificial trans fats in the food supply are partially hydrogenated oils, one of the most used source of fat in commercial bakery products.

Dietary fat distribution of the HNNHS population in total and by tertile of TFA consumption

| | Total Population N=3537 | 1st Tertile N=1163 | 2nd Tertile N=1196 | 3rd Tertile N= 1178 | P for differences | P for trend |
|--------------------------------------|------------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------|--------------------|
| Total fat, %en, mean (sd) | 38.1 (10.3) | 35.0 (11.9) | 38.1 (9.3) | 41.0 (8.7) | <0.001 | <0.001 |
| TFA, % energy, mean (sd) | 0.53 (0.34, 0.81) | 0.27 (0.17, 0.34) | 0.53 (0.47, 0.61) | 0.95 (0.81, 1.31) | <0.001 | <0.001 |
| SFA, % energy, mean (sd) | 12.6 (4.3) | → 10.1 (3.8) | 13.0 (3.6) | 14.6 (4.3) ← | <0.001 | <0.001 |
| PUFA %en, median IQR | 4.9 (3.9, 6.4) | 4.8 (3.7, 6.3) | 4.8 (3.8, 6.3) | 5.2 (4.1, 6.5) | <0.001 | <0.001 |
| MUFA %en, mean (sd) | 17.1 (6.1) | 16.9 (7.3) | 16.7 (5.6) | 17.6 (5.2) | 0.003 | <0.001 |
| Total energy, mean (sd) | 1937 (859) | 1956 (904) | 1915 (817) | 1942 (856) | 0.022 | 0.501 |

TABLE 2

Percentage of SFA, *trans* fatty acid, and industrial *trans* fatty acid (g/100 g fat) in different types of nonprepacked savory baked goods (mean and SD) collected in 2015³ and 2021

| Type of product | SFA (g/100 g fat) (2015) ³ | SFA (g/100 g fat) (2021) | total TFA (g/100 g fat) (2015) ³ | total TFA (g/100 g fat) (2021) | i-TFA (g/100 g fat) (2015) ³ | i-TFA (g/100 g fat) (2021) | No. of samples exceeding the legal limit (i-TFA>2%) (2015) | No. of samples exceeding the legal limit (i-TFA>2%) (2021) |
|--|---|--------------------------------|---|--------------------------------------|---|----------------------------------|--|--|
| Cheese pies with phyllo pastry | 37.90 (11.62) | 36.42 (9.86) | 1.28 (0.50) | 0.66 (0.25) | 0.76 (0.57) | 0.06 (0.11) | 0 (0%) | 0 (0%) |
| Cheese pies with shortcrust pastries | 49.13 (5.53) | 48.21 (6.33) | 2.75 (2.24) | 2.24 (1.83) | 2.36 (1.98) | 1.78 (1.81) | 5 (50%) | 6 (31.6%) |
| Cheese pies with puff pastry | 55.03 (2.59) | 55.11 (2.55) | 4.09 (2.17) | 1.21 (1.06) | 3.72 (2.31) | 0.96 (1.06) | 7 (63.6%) | 2 (9.1%) |
| Bougatsa with cheese | - | 45.44 (5.91) | - | 1.60 (1.19) | - | 0.93 (1.17) | - | 5 (25%) |
| Pizza/Peinirli ¹ | 54.1 (5.9) | 54.20 (9.14) | 1.02 (0.36) | 1.52 (0.65) | 0.00 (0.01) | 0.24 (0.71) | 0 (0%) | 2 (10%) |
| Vegetarian pies (e.g., spinach or leek pie) | 19.9 (6.9) | 23.14 (12.03) | 0.77 (0.58) | 0.34 (0.20) | 0.76 (0.63) | 0.30 (0.20) | 0 (0%) | 0 (0%) |
| Meat-containing pies (e.g., sausage pies, ham pies) ² | 50.5 (2.4) | 47.15 (9.59) | 1.93 (1.27) | 0.77 (0.77) | 1.81 (1.23) | 0.63 (0.82) | 2 (40%) | 1 (5.26%) |
| All SBGs | 45.78 (12.78) | 44.34 (13.29) | 2.28 (1.97) | 1.19 (1.14) | 1.87 (1.98) | 0.69 (1.11) | 14 (31.1%) | 16 (11.4%) |

i-TFA, industrial *trans* fatty acids; SBG, savory baked good; SD, standard deviation; SFA, saturated fatty acids; TFA, *trans* fatty acids.

¹ In 2015, pizza slice samples from bakeries were collected, whereas in 2021, pizza boat (peinirli) samples from bakeries were collected.

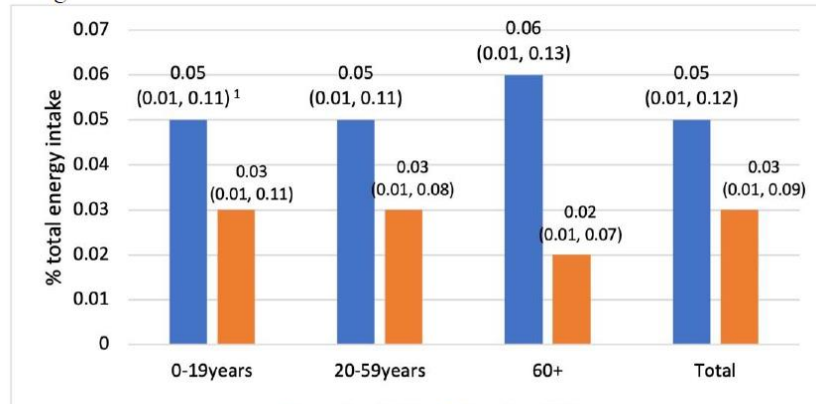
² In 2015, only sausage pies were collected ($N = 5$), whereas in 2021, sausage pies ($N = 16$), cheese and ham pies ($N = 3$), and cooked beef in tomato sauce pies ($N = 1$) were collected.

³ Reproduced from reference [9] with permission.

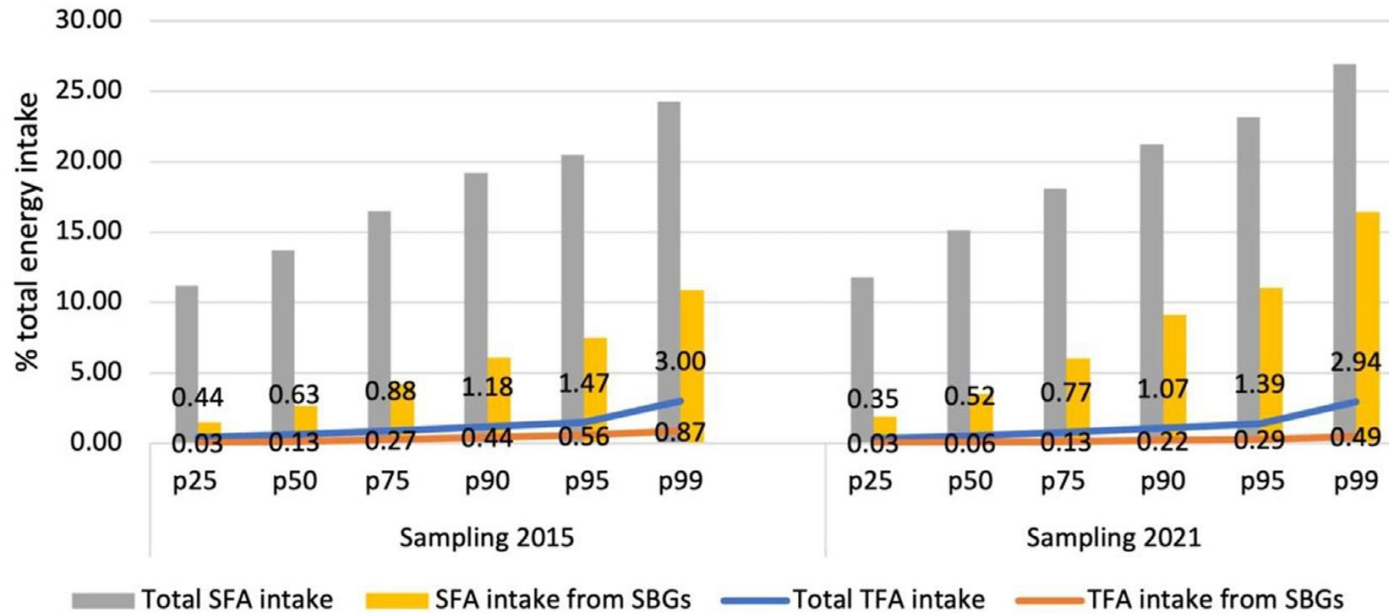
Trans Fat intake in Greece before and after the trans policy & food reformulation

| i-TFA (g/100 g fat) (2015) ³ | i-TFA (g/100 g fat) (2021) |
|---|----------------------------------|
| 0.76 (0.57) | 0.06 (0.11) |
| 2.36 (1.98) | 1.78 (1.81) |
| 3.72 (2.31) | 0.96 (1.06) |
| - | 0.93 (1.17) |
| 0.00 (0.01) | 0.24 (0.71) |
| 0.76 (0.63) | 0.30 (0.20) |
| 1.81 (1.23) | 0.63 (0.82) |
| 1.87 (1.98) | 0.69 (1.11) |

Figure 3. i-TFA intake from SBGs, as % of daily total energy intake, in total and by age group using substitution models*.



Essential in public health to specify replacers

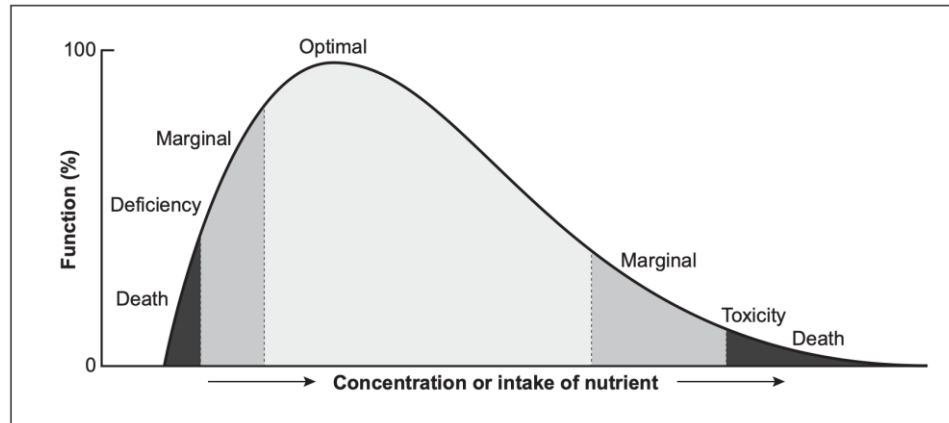


Trans Fat intake in Greece before and after the trans policy & food reformulation

Substitution models: measured SFA and TFA content in savory baked goods in 2021 were placed from those measured during the HNNHS study years (2015) to evaluate TFA intake amounts post Regulation (EU)2019/649 if food intakes remained unaltered

Voluntary Food Reformulations

- Based on dietary recommendations for a “healthier” food product based on consumption data of high population intakes
 - Salt
 - Saturated Fat
 - Sugar (added)
- Reformulations also seen for many vitamins & minerals
 - Has been shown through RCT’s to improve micronutrient intakes and status of various population groups
 - Safety issue

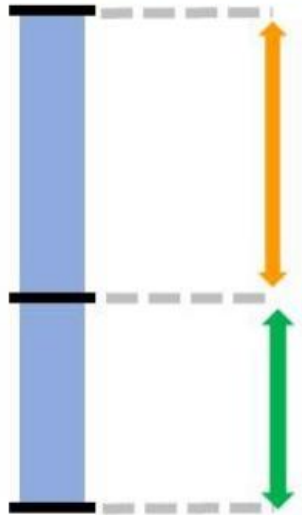


Hypothetical micronutrient intake/status distribution

Voluntary Food Reformulations

- Potential misplaced emphasis if not based on population based data/needs
- Risk management: setting upper fortification levels in foods and supplements to avoid deficiencies & toxicities
 - Task Force on Maximum amounts of vitamins and minerals in food supplements and fortified foods (European Commission)

UL (tolerable upper intake level)



Assessed & Set by
EFSA

R (residual amount):
available for Food Supplements and Fortified Foods

BI (Base intake of high consumers):
consumption with conventional foods

Common starting point:

$$R = UL - BI$$

Based on
population
consumption data

Examples of critical areas to consider for setting UL's

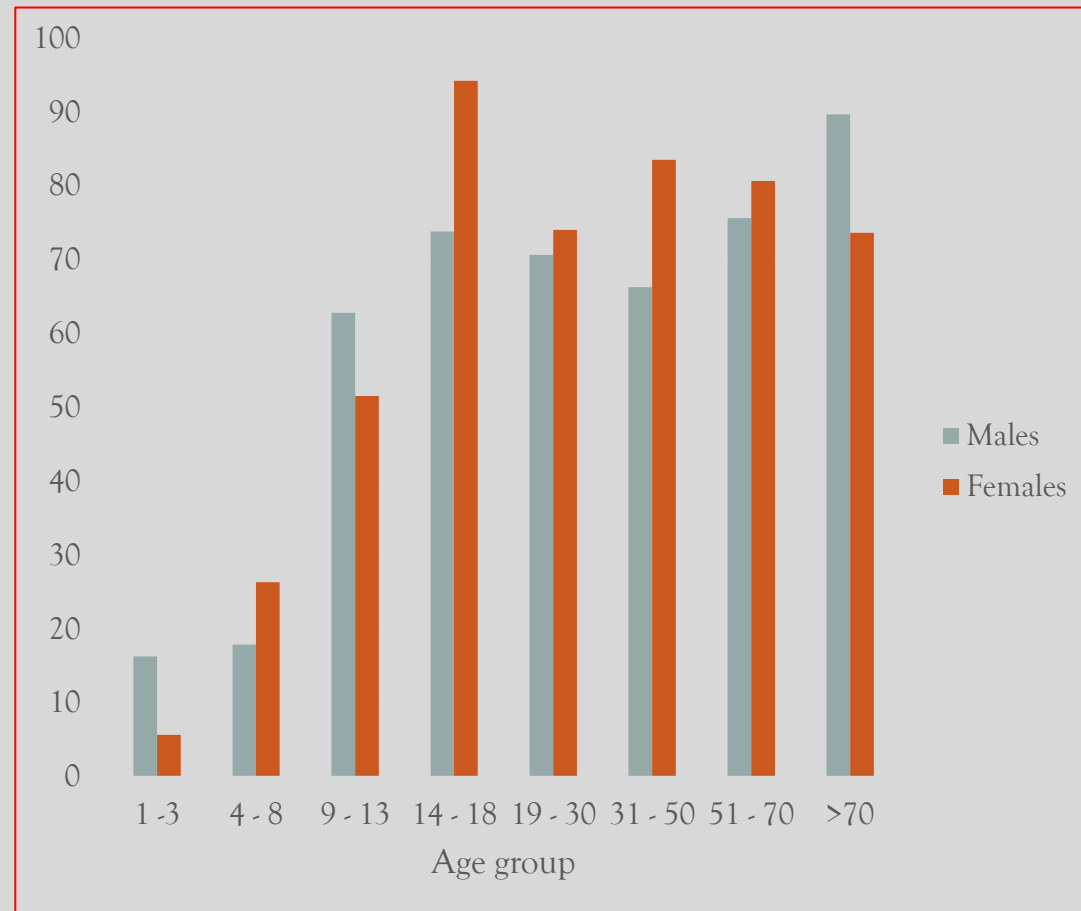
| Nutrient | Critical endpoint/effect |
|-----------------|--|
| Boron | Foetal body weight |
| Calcium | Milk-alkali syndrome |
| Copper | Hepatotoxicity |
| Fluoride | Bone fracture (adults and children > 8 years) Dental fluorosis (children < 8 years) |
| Folic acid | Masking/exacerbation of vitamin B12 deficiency symptoms (pernicious anaemia) |
| Iodine | Serum TSH levels |
| Magnesium | Laxative effects |
| Molybdenum | Reproductive toxicity |
| Nicotinamide | Markers of hepatic functions and glucose homeostasis |
| Nicotinic acid | Flushing |
| Selenium | Clinical selenosis |
| Vitamin A | Teratogenicity |
| Vitamin B6 | Neurotoxicity |
| Vitamin D | Hypercalcaemia (adults) Serum 25(OH)D (infants) |
| Vitamin E | Blood clotting |
| Zinc | Copper status |

Folic acid intake among the Greek population, by sex and age group below the AR (from food only)

- *In 1998 mandatory fortification of all refined flours in the US for public health (decrease NTD's)*

Since then, mandatory in other countries as well

Remains voluntary in EU



Mitsopoulou, A et al. "Micronutrient intakes and their food sources among Greek children and adolescents." *PHN*; vol. 23,13 (2020): 2314-2326.

Mitsopoulou, Anastasia Vasiliki et al. "Micronutrient dietary intakes and their food sources in adults: the Hellenic National Nutrition and Health Survey (HNNHS)." *JHND*; vol. 34,3 (2021): 616-628.

*Main Problem:
Risk
underestimation of
Baseline Intake
levels*

1. Data consumption surveys vary methodologically
2. Not all countries have nutritional surveys – consumption data
3. Limited amount of data available that have specified food fortification (in non-mandatory cases)
4. Inadequate food supplementation documentation

Supporting
environment
for dietary
choices

Dietary
choices to
support the
environment



Health

Sustainability

AN
IMPORTANT
AREA TO
CONSIDER:

Plant Based Foods

Food Reformulation, Health & Sustainability

Plant Based Diets
are more
sustainable but are
they also adequate
nutrient replacers?

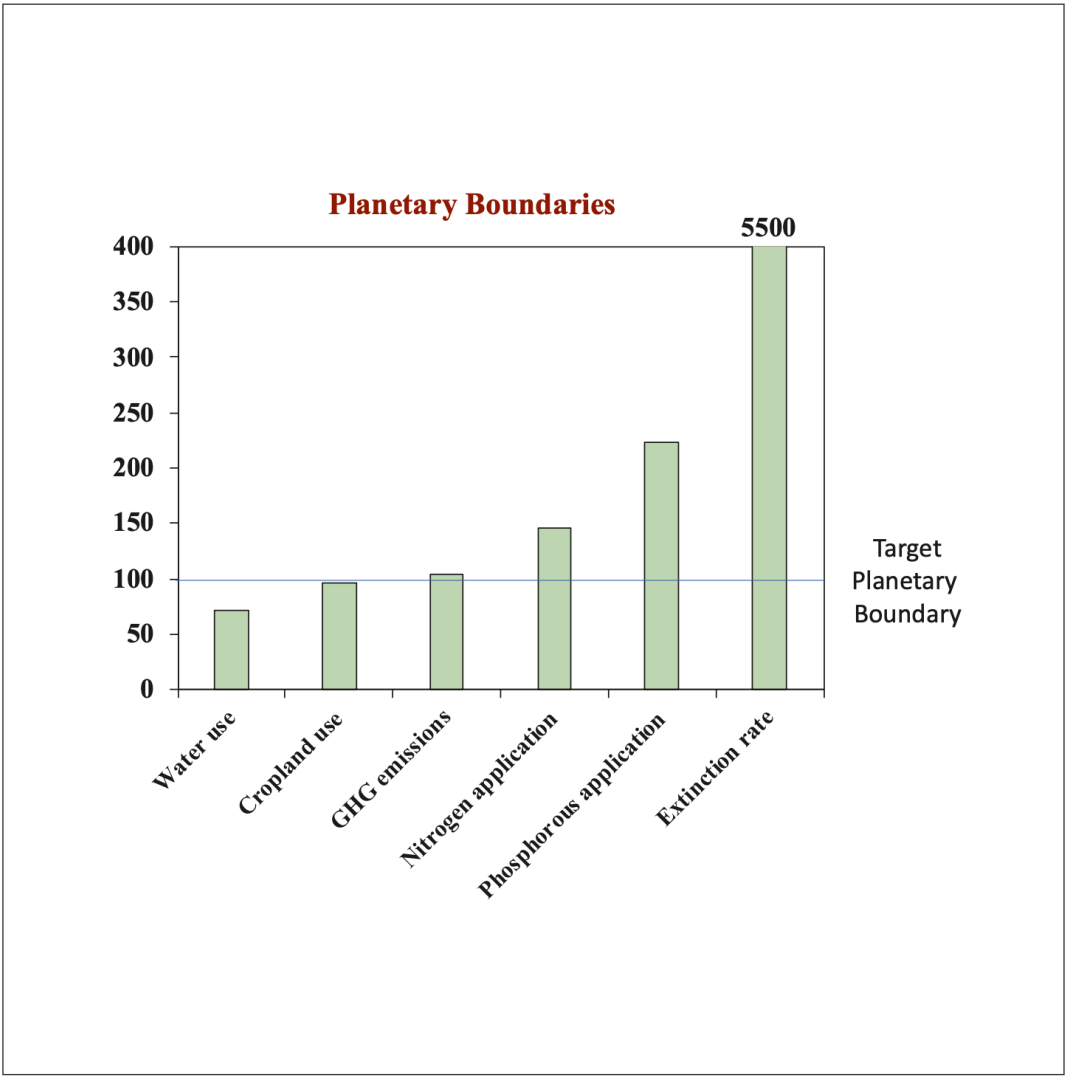
| AHA Features* | Vegetarian | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---------------|-------------|-----------------------|----------------|-----------------------------|-------------------------------------|--|--------|---|--|------|------|------|------|------|------|------|------|------|------|-------------------|------|------|------|---|---|------|------|------|------|------|---|------|------|------|---|---|------|------|------|------|------|---|------|------|------|---|---|------|------|------|------|------|
| | DASH-style (Nordic, Baltic) | Mediterranean | Pescetarian | Ovo. Lacto. Ovo-Lacto | Vegan >10% fat | Low-fat, (TLC, Volumetrics) | Very low-fat <10% fat (often vegan) | Low-carb (Zone, South Beach, Low-Glycemic Index) | Paleo | Very low-carb (Atkins, Ketogenic, WFKD) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ① Energy balance needed to maintain a healthy weight | Not Scored | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ② Eat plenty of vegetables and fruits, a wide variety† | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.5 | 0.5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ③ Choose mostly whole grains rather than refined grains† | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0.5 | 0.5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adequate Healthy Plant-Based and Other Protein Sources‡ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ④ | <table border="1"> <tr> <td>Mostly protein from plants (legumes and nuts)‡</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> </tr> <tr> <td>Fish and Seafood‡</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>1</td> <td>1</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> </tr> <tr> <td>Low-Fat or fat-free dairy products instead of full-fat dairy‡</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>1</td> <td>1</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> </tr> <tr> <td>If consuming meat or poultry, choose lean cuts‡</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>1</td> <td>1</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> <td>0.75</td> </tr> </table> | | | | | | | | | | Mostly protein from plants (legumes and nuts)‡ | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | Fish and Seafood‡ | 0.75 | 0.75 | 0.75 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | Low-Fat or fat-free dairy products instead of full-fat dairy‡ | 0.75 | 0.75 | 0.75 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | If consuming meat or poultry, choose lean cuts‡ | 0.75 | 0.75 | 0.75 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Mostly protein from plants (legumes and nuts)‡ | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fish and Seafood‡ | 0.75 | 0.75 | 0.75 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low-Fat or fat-free dairy products instead of full-fat dairy‡ | 0.75 | 0.75 | 0.75 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| If consuming meat or poultry, choose lean cuts‡ | 0.75 | 0.75 | 0.75 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑤ Use liquid plant oils rather than tropical oils‡ | 1 | 1 | 0.75 | 1 | 0.75 | 1 | 0 | 1 | 0.5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑥ Minimize intake of beverages and foods with added sugars† | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑦ Choose and prepare foods with little or no salt† | 1 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑧ If you do not drink alcohol don't start, if you choose to drink alcohol, limit intake** | 1 | 0.5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑨ Choose minimally processed foods instead of ultraprocessed foods†† | 1 | 1 | 1 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ⑩ Adhere to this guidance wherever food is prepared or consumed† | 1 | 1 | 1 | 0.5 | 0 | 0.5 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Points | 9 | 8 | 8.25 | 7.75 | 7 | 7 | 6.5 | 5.75 | 4.75 | 2.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Score normalized to 100% (Range 0-100)‡‡ | 100 | 89 | 92 | 86 | 78 | 78 | 72 | 64 | 53 | 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tiers | Tier 1 | | | Tier 2 | | | Tier 3 | | Tier 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Legend

- 1 point= fully meets recommendation
- 0.75 points= mostly meets recommendation
- 0.5 points= partially meets recommendation and/or insufficiently clear
- 0 points= does not meet recommendation
- Not scored because food group is not included in the dietary pattern
- Hatched cells denote the 4 sub features of the protein recommendation

Planetary & Human health

Price and energy and nutritional content of cows' milk yogurt and coconut, nuts and soya plant-based yogurt alternatives available on the UK market.



| Variable | Cow ¹ | | Coconut ² | | Nuts ³ | | Soya ⁴ | | P-value ⁵ |
|-----------------------------------|------------------|---------------------------|----------------------|----------------------------|-------------------|---------------------------|-------------------|---------------------------|----------------------|
| | n | Mean±SE | n | Mean±SE | n | Mean±SE | n | Mean±SE | |
| Price (GBP/100g) | 78 | 0.30±0.017 ^d | 10 | 0.55±0.038 ^b | 10 | 0.87±0.034 ^a | 35 | 0.44±0.04 ^c | <0.001 |
| Energy (kcal/100g) | 78 | 83.31±3.672 ^b | 10 | 111.70±4.854 ^a | 10 | 96.80±3.777 ^{ab} | 35 | 68.43±2.019 ^c | <0.001 |
| Fat (g/100g) | 78 | 3.26±0.366 ^b | 10 | 6.17±0.888 ^a | 10 | 6.69±0.43 ^a | 35 | 2.25±0.064 ^b | <0.001 |
| Saturated fat (g/100g) | 78 | 2.14±0.239 ^b | 10 | 6.14±0.914 ^a | 10 | 1.17±0.485 ^{bc} | 35 | 0.40±0.025 ^c | <0.001 |
| Carbohydrates (g/100g) | 78 | 8.13±0.412 ^b | 10 | 11.57±1.295 ^a | 10 | 6.43±0.61 ^b | 35 | 7.05±0.57 ^b | 0.003 |
| Sugars (g/100g) | 78 | 7.58±0.375 ^a | 10 | 7.80±1.437 ^a | 10 | 2.71±0.726 ^b | 35 | 6.71±0.568 ^a | <0.001 |
| Fibre (g/100g) | 45 | 0.10±0.030 ^c | 8 | 0.35±0.135 ^b | 8 | 0.13±0.125 ^{bc} | 35 | 1.03±0.067 ^a | <0.001 |
| Protein (g/100g) | 78 | 5.32±0.192 ^a | 10 | 0.82±0.092 ^c | 10 | 1.89±0.061 ^c | 35 | 3.93±0.097 ^b | <0.001 |
| Salt (g/100g) | 78 | 0.16±0.006 ^b | 10 | 0.24±0.062 ^a | 10 | 0.22±0.037 ^a | 35 | 0.20±0.014 ^a | 0.003 |
| Vitamin D (µg/100g) | 0 | * | 6 | 0.75±0.000 | 0 | * | 26 | 0.76±0.032 | 0.932 |
| Vitamin B ₁₂ (µg/100g) | 0 | * | 6 | 0.38±0.000 | 0 | * | 25 | 0.37±0.006 | 0.310 |
| Calcium (mg/100g) | 44 | 153.80±4.385 ^a | 6 | 128.00±0.000 ^{ab} | 0 | * | 32 | 111.00±7.487 ^b | <0.001 |

n = number of samples, SE = standard error of mean

Price and energy and nutritional content of cows' milk cheese and nuts and seed and oil plant-based cheese alternatives available on the UK market.

| Variable | Cow ¹ | | Nuts & Seeds ² | | Oils ³ | | P-value ⁴ |
|-----------------------------------|------------------|----------------------------|---------------------------|----------------------------|-------------------|---------------------------|----------------------|
| | n | Mean | n | Mean | n | Mean | |
| Price (GBP/100g) | 38 | 0.76±0.073 ^c | 7 | 2.52±0.496 ^a | 102 | 1.29±0.042 ^b | <0.001 |
| Energy (kcal/100g) | 38 | 312.90±13.730 ^a | 6 | 240.50±12.000 ^c | 102 | 284.30±2.569 ^b | <0.001 |
| Fat (g/100g) | 38 | 26.04±1.402 ^a | 6 | 21.00±2.066 ^b | 102 | 22.94±0.262 ^b | 0.003 |
| Saturated fat (g/100g) | 37 | 17.36±0.723 ^b | 6 | 2.13±0.304 ^c | 102 | 19.22±0.315 ^a | <0.001 |
| Carbohydrates (g/100g) | 38 | 1.80±0.299 ^b | 6 | 5.42±1.496 ^b | 102 | 17.58±0.757 ^a | <0.001 |
| Sugars (g/100g) | 37 | 1.52±0.284 ^a | 6 | 2.48±1.041 ^a | 102 | 0.62±0.128 ^b | <0.001 |
| Fibre (g/100g) | 25 | 0.25±0.124 ^b | 3 | 2.47±0.203 ^a | 46 | 3.17±0.277 ^a | <0.001 |
| Protein (g/100g) | 38 | 16.57±1.304 ^a | 6 | 6.45±0.220 ^b | 102 | 1.05±0.182 ^c | <0.001 |
| Salt (g/100g) | 37 | 1.10±0.099 ^b | 6 | 1.25±0.115 ^{ab} | 102 | 1.77±0.067 ^b | <0.001 |
| Vitamin D (µg/100g) | 0 | * | 0 | * | 9 | 0.22±0.148 | * |
| Vitamin B ₁₂ (µg/100g) | 0 | * | 0 | * | 43 | 2.23±0.113 | * |
| Calcium (mg/100g) | 7 | 651.70±44.090 | 0 | * | 21 | 352.8±71.510 | 0.027 |
| Potassium (mg/100g) | 0 | * | 0 | * | 7 | 68.81±18.800 | * |

n = number of samples, SE = standard error of mean

Planetary & Human health

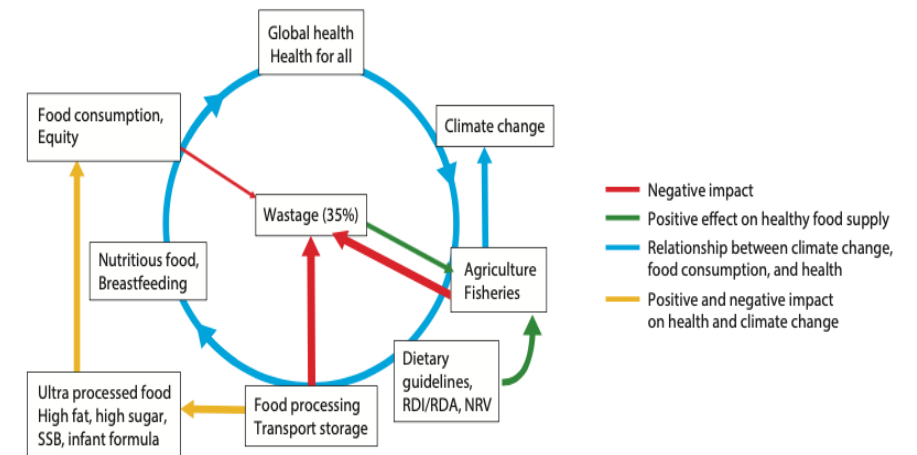
Lower Energy
 Variation in SFA
 Lower protein
 & Higher salt content

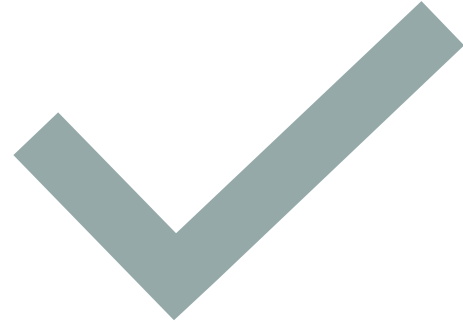
Health & Sustainability

Although plant-based products have been labelled predominantly as sustainable, compared to animal products,

in the current era, the trend is the production of “healthy”, fortified, plant-based foods, often ready to consume.

- These foods, to date, have not been assessed in terms of health nor sustainability,
- The greater the processing, the higher the waste production (Binns et al., 2021)
- Lower sustainability
- Questionable positive health impact if levels of fat, sugar and salt are not monitored.





Overall food reformulations & innovative plant-based food, hold great promise for healthier foods but requires public health campaigns to increase consumer awareness and further research regarding health & environmentally sustainable products.

Conclusion

- Data on current dietary patterns accounting food reformulations and supplement consumption are required
 - Consumption data
- Mandatory policies should define replacers also, based on health recommendations, for public health amelioration
- Health impact & sustainability assessment of newly derived plant-based foods is required
- Consumer awareness should be also emphasized



Thank you!