FOUNDATION EARTH

POSITION PAPER 3

SHOULD AN ENVIRONMENTAL IMPACT LABEL FACTOR IN NUTRITIONAL ADJUSTMENTS?

Objective

This position paper explains the current position which Foundation Earth has taken on the inclusion of nutritional adjustment as part of the method or as part of the grading system for the newly developed Foundation Earth PEF-friendly LCA system.

Foundation Earth Grading System

The Foundation Earth grading system has been designed to easily communicate the environmental cost of a food product to consumers. Foundation Earth's focus is on the environmental cost of food production, but a number of stakeholders have suggested that consideration should be given to the inclusion of additional adjustments to reflect the nutritional content of food.

In this paper, Foundation Earth explains its current position on the inclusion of nutritional adjustments to grading, and comments briefly on the reasons for not currently including animal welfare as an adjustment factor.

The importance of a nutritionally balanced diet

Foundation Earth recognises that a nutritionally balanced diet is critical to the delivery of good human health. The main argument for the inclusion of nutritional adjustments of an Ecolabel grade is that human health should be the primary consideration when a consumer is purchasing food. Consequently, it is argued that any label should reflect the nutritional value of a food product. Van Kennebunk et al. (2014) stated that food-based LCA studies typically utilise functional units based on mass or volume of a given product, rather than the true function of the commodity, which is to provide nutrition.

Forouzanfar et al. (2016) stated that dietary risks from an unbalanced diet are the largest group of risk factors for preventable human disease – causing 9.6% of the Global Burden of Disease (229 million disability adjusted life years annually). Imamura et al. (2015) suggests that more than half of the global population lives on an unbalanced diet. This finding emphasises the importance of consumers' understanding of the nutritional content of a food product, and the importance of encouraging consumers to consume a balanced diet.

The complexity of human dietary requirements

According to the World Health Organisation[1], human nutrient requirements include protein, energy, carbohydrates, fats and lipids, a range of vitamins, and a host of minerals and trace elements. It states that "Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases (such as diabetes and cardiovascular disease), and longevity." Consequently, any environmental cost formulation must ensure that each person receives a diet which is entirely suitable for their needs.

The WHO has published the following recommendations[2] about what constitutes a healthy diet.

- Fruit, vegetables, legumes (e.g., lentils and beans), nuts and whole grains (e.g., unprocessed maize, millet, oats, wheat and brown rice).
- At least 400 g (i.e. five portions) of fruit and vegetables per day , excluding potatoes, sweet potatoes, cassava, and other starchy roots.
- Less than 10% of total energy intake from free sugars, which is equivalent to 50 g (or about 12 level teaspoons) for a person of healthy body weight consuming about 2000 calories per day, but ideally is less than 5% of total energy intake for additional health benefits . Free sugars are all sugars added to foods or drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.
- Less than 30% of total energy intake from fats. Unsaturated fats (found in fish, avocado and nuts, and in sunflower, soybean, canola and olive oils) are preferable to saturated fats (found in fatty meat, butter, palm and coconut oil, cream, cheese, ghee and lard) and *trans*-fats of all kinds, including both industrially-produced *trans*-fats (found in baked and fried foods, and pre-packaged snacks and foods, such as frozen pizza, pies, cookies, biscuits, wafers, and cooking oils and spreads) and ruminant *trans*-fats (found in meat and dairy foods from ruminant animals, such as cows, sheep, goats and camels). It is suggested that the intake of saturated fats be reduced to less than 10% of total energy intake and *trans*-fats to less than 1% of total energy intake *(5)*. In particular, industrially produced *trans*-fats are not part of a healthy diet and should be avoided *(4, 6)*.
- Less than 5 g of salt (equivalent to about one teaspoon) per day. Salt should be iodized.

Although there is extensive information around human dietary need, judging the effect of a specific food on human health is difficult for a number of reasons:

- The effect of a food is dependent on the other foods which are consumed alongside it.
- The effect of a food is dependent on the quantity which is consumed. There are many foods which are beneficial to a certain level of intake, but which cease to be beneficial, or even become detrimental above a

1 Establishing global nutrient requirements (who.int)

2 Healthy diet (who.int)

certain level of intake.

- Different people have different dietary requirements, meaning that the same food has different value to different individuals.
- The specific effect of some foods is related to multiple components of that food.

In reality, there are too many food components and influencing factors to account for to enable all of these to be included in an adjustment factor, meaning that if an adjustment is to be made, proxies will have to be used.

Including nutritional content as part of an ecolabel

Because optimal nutrition is so important, Foundation Earth has engaged with multiple stakeholders and clients to consider the inclusion of adjustment factors for nutritional content in the Foundation Earth grading system. As part of this, considerations have been given to the components which could be used to reflect the nutritional value of a food product.

If a nutritional adjustment is to be applied, a decision needs to be made about the nutrients which would be used to make the adjustment. The main food components which can be used to guide nutritional adjustment of grading are as follows:

1. Energy density of the food
2. Protein density of the food
3. Fibre density of the food
4. Essential fatty acid content
5. Fat content
6. Sugar content
7. Mineral content
8. Vitamin content
9. Overall micronutrient content

The primary components or systems which were considered for inclusion are described below.

Energy content

Strong arguments can be made for using the energy content of the food as the basis for a nutritional adjustment of grades. It is argued that the primary physiological reason for consumption of food is to provide the necessary energy to allow body functions to be effectively delivered. The human body has an ongoing requirement for energy, and a lower amount of energy dense food will need to be consumed to sustain life, meaning that a correction for energy density may be appropriate.

A counter argument is that, for developed countries, energy intake is rarely an issue, and many consumers do not limit

their food consumption on the basis of its energy content. This means that energy content of food has the potential to be a negative as well as a positive, and its inclusion as a factor for nutritional alteration is, at best, controversial.

On the basis that there is not a clear-cut argument for the use of energy density to make nutritional alterations, Foundation Earth has concluded that it should not be used.

Protein content

A strong argument can be made for the inclusion of protein density as a factor for inclusion in any nutritional adjustment. The reasons for this include:

- Protein is relatively ubiquitous in the food system, so a diet which is deficient in protein is also likely to be deficient in other nutrients such as vitamins and minerals[3].
- Protein is an essential dietary component which can also act as an energy source within the diet.
- Foods which are rich in protein and fibre deliver more satiety than carbohydrate-rich foods, while sweet tasting foods and foods rich in fat deliver less satiety (Chamber et al. 2015; Hopkins et al. 2016). Satiety has implications for the environmental impact of food because food which contributes to higher satiety increases the time taken before additional food is consumed, reducing the overall consumption of food.

Because protein is an important component of the diet, we have concluded that protein would be likely to be used as an adjustment factor in any Foundation Earth grading system, if Foundation Earth were to implement a nutritional adjustment factor.

Fibre content

Van Dooren (2016) identified fibre content of food as a key component which could be measured and used to be a component which is used to adjust grades awarded to feed. If Foundation Earth were to implement nutritional adjustment to grading, fibre would be one of the components on which the adjustment is based.

Essential fatty acid content

Van Dooren (2016) also stated that fatty acid composition of a food is a key component which could be measured and used to adjust the grade awarded to a food product. Again, if Foundation Earth were to implement a nutritional adjustment to grading, fibre would be one of the components on which the adjustment is based.

Impact on satiety

Whilst the Satiety of the diet is important, Weidema and Stylianou (2020) noted that “the knowledge of satiety differences between major food groups is not sufficient to establish general quantified measures at the level of individual food components”. They go on to suggest that this would mean that a satiety factor would be difficult to apply to individual foods.

Due to the lack of scientific knowledge around satiety and the interaction between different foods, Foundation Earth has concluded that nutritional adjustments cannot presently be made using satiety as a factor.

Micronutrient content

Micronutrients are vital to optimise human health, and could potentially be used to adjust an LCA grade. However,

3 Protein - British Nutrition Foundation

whilst the function of macronutrients is known, no single food contains all required micronutrients, and adequate micronutrient intake is strongly related to the overall diet of a person and the variation in foods which are consumed. The complexity of micronutrient action and interaction means that their use for correction of LCA grades is not currently being considered by Foundation Earth.

Three factor adjustment

A number of scientific papers have been produced which consider the basis for nutritional adjustment of LCA grades. The most relevant of these to Foundation Earth was Van Dooren (2016)[4] .

Van Dooren (2016) investigated models of influencing grades using nutritional factors. They investigated a range of models and concluded that these models have a common structure: "they include macronutrients to encourage (protein, dietary fibre, and sometimes essential fatty acids) and macronutrients to limit (salt, added sugar and saturated fatty acids)". They propose using a Nutritional Density Unit as a correction factor.

Van Dooren stated that it was sufficient to include three nutrients for nutritional correction factors, these being "*total protein, essential fatty acids, and dietary fibre, because these elements correlate significantly with all other essential nutrients*." McAuliff et al. (2020)[5] stated that any nutritional factor which would be applied as part of the grading process would focus on these three main components. This is feasible, on the basis that Agribalyse includes information about protein content, fibre, and essential fatty acids which could be used to adjust the grade.

Least impact formulation

Instead of considering individual components of the diet and making adjustments on the basis of the density of specific components in the food, the option exists to assess the nutritional value of food based on its contribution to a fully balanced diet. In theory, this is a strong option as it would incentivise the consumption of a healthy diet, but in practice, determination of the appropriate diet would be extremely difficult, and would require an overall system which was based on serving sizes, food classes, and the requirements of the person who is consuming the diet. Accurate delivery of this is highly complex and would require extensive research and consumer education to deliver appropriately.

A strong argument against this approach is that the reformatting of the human diet to only eat the least impactful products would reduce the overall positive impact of an ecolabelling system for the following reasons:

1. People do not just eat for fuel, they eat for enjoyment, and a least environmental cost formulation is likely to appeal to only the most committed.
2. The least impacting food types cannot necessarily be produced at the level which is required to ensure that all receive enough food.
3. Environmental numbers are often used to suggest that a plant-based diet would reduce the climate effect of food production, which is likely to be true, but which is also an oversimplification, ignoring the beneficial impacts (if managed correctly) of animal agriculture on land and soil structure. Assessing impact accurately

4 Dooren, Corné. (2016). Proposing the Nutrient Density Unit as the Functional Unit in LCAs of Foods.

5 McAuliffe, G.A., Takahashi, T. & Lee, M.R.F. Applications of nutritional functional units in commodity-level life cycle assessment (LCA) of agri-food systems. Int J Life Cycle Assess 25, 208–221 (2020).

is therefore very difficult.

As a consequence, Foundation Earth acknowledges that it is overwhelmingly likely that people will continue to consume food which is not necessarily the lowest impact food, and has concluded that the use of Least Impact Formulation is not currently an option in any Foundation Earth grading adjustment.

Challenges around application of nutritional adjustment

The challenges around the application of nutritional adjustments are as follows:

1. The application of nutritional adjustment is highly complex
2. The impact of specific nutritional components is difficult to isolate
3. The impact of a specific food is dependent on the volume of that food which is consumed and the other foods which are consumed alongside it
4. The introduction of a nutritional adjustment requires that a subjective judgement is made about the relative value of high nutritional density versus the environmental impact of the food
5. There is potential for confusion or misdirection where a product is sustainable but unhealthy (or vice versa)

Difficulties around labelling for multiple factors

There is widespread use of product labelling on a global basis. These labels cover factors such as nutritional content, environmental impact, packaging type, animal welfare, biodiversity impact, etc. The use of these labels is restricted by the amount of space available, and it is not often possible to add several different labels to a pack. In addition, it is sometimes argued that the use of a single label could reduce 'information anxiety' on the part of the consumer, enabling them not to have to choose between nutrition impact and eco impact. As a consequence, some stakeholders believe that Foundation Earth should consider the creation of a label which reflects attributes like nutritional content and animal welfare in addition to the environmental impact of the product.

The most significant challenge around labelling for multiple factors is that the inclusion of several different components always requires trade-offs, and always reduces overall transparency to the consumer. However, work by Potter et al. (2023)[6] suggested that combined environmental and nutrition could be effective at encouraging positive choices. However, other research work found that combined labelling or the use of multiple labels on the same pack is ineffective[7].

Foundation Earth has concluded that, currently there is limited evidence for the benefits of combined labelling, and that there is potential for confounding effects, and confusion of the consumer. We believe that further research and investigation is justified. However, we also recognise that obtaining agreement over a single, harmonised environmental label is already a very large challenge which demands a very specific focus and expertise, and it is

6 Christina Potter, Rachel Pechey, Brian Cook, Paul Bateman, Cristina Stewart, Kerstin Frie, Michael Clark, Carmen Piernas, Mike Rayner, Susan A. Jebb, Effects of environmental impact and nutrition labelling on food purchasing: An experimental online supermarket study, Appetite, Volume 180, 2023,

7 J. Barreiro-Hurle, A. Gracia, T. De-Magistris The effects of multiple health and nutrition labels on consumer food choices Journal of Agricultural Economics, 61 (2) (2010), pp. 426-443

unwise to divide resources on this.

Summary of Foundation Earth position

Multiple decisions have been made around the factors which will be included in the Foundation Earth “Farm to Fork” (covering cradle to grave life cycle stages) PEF system. A range of adjustment factors have been considered for inclusion, including nutritional content of the food and animal welfare. Of these, the most important initial factor for consideration is the nutritional content of the food.

Foundation Earth believes that the inclusion of nutritional adjustment of grades should potentially be considered in the future, once the Foundation Earth PEF methodology is fully developed, tested and being used widely.

However, examination of the factors which would need to be considered and addressed to enable effective nutritional adjustment has shown that the level of work which is necessary to produce accurate nutritional adjustment is such that it could not currently be effectively delivered by Foundation Earth until the methodology is fully refined and an extensive database of scores has been created from practical delivery of the methodology.

Consequently, we have concluded that a nutritional adjustment of Foundation Earth grading will not be considered for implementation until the development of the PEF assessment system is broadly complete (barring the ongoing development which will always be required).

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