Policy Brief 2025

The sustainability of the food system can be improved by using nutrition as a basis for comparing the environmental impact of food

More sustainable food production and consumption requires information on both environmental and nutritional aspects to ensure that people are adequately nourished within the carrying capacity of the environment.

The methodology developed by Luke for use in Life Cycle Assessment (LCA) of food products allows the environmental impact of food products to be assessed in relation to their nutritional function. It facilitates the comparison of products and can be used, for example, to select more sustainable protein sources or to develop products.

We recommend that

1. Product group-specific nutrient indices are included in the life cycle assessment of foods as nutritional functional units and are introduced into the standardised EU PEF (Product Environmental Footprint) methodology.
2. The simultaneous consideration of environmental and nutritional aspects of products in consumer communication will be enabled by relevant legislation.
3. Environmental labelling of food products based on the use of product group-specific nutrient indices will be promoted in the EU.
4. Food companies will actively use the developed nutrient indices in accordance with the management in the life cycle assessments of their products and use the information obtained in their consumer communication within the limits of the legislation.

Luke

Recommendation 1

Include product group-specific nutrient indices as nutritional functional units in the Life Cycle Assessment of food and introduce them into the standardised EU PEF (Product Environmental Footprint) methodology

Life Cycle Assessment is a key tool for improving the environmental performance of consumption and production. Its practices are based on international standards (ISO 14000 series) and specific guidelines. The EU has its own Life Cycle Assessment initiative, the Product Environmental Footprint (PEF) and its own legislation. The aim is to promote sustainable business in the EU, while at the same time offering consumers the opportunity to consume more sustainably. The standards and guidelines will contribute to the implementation of life cycle assessments and the comparability of the data produced. It is therefore important that the guidelines include key methodologies for reliable comparability of products.

"Linking nutrition to food life cycle assessment is important because the primary function of food is to provide adequate nutrition."

Life Cycle Assessment is an environmental performance measure that looks at the environmental impacts in relation to the benefits generated (Figure 1). Sometimes, for example from a production perspective, the benefit may be the volume of production, but for consumption purposes the focus is usually on the intended use of the product. Today, the results of life cycle assessment are usually expressed per unit mass.

The integration of nutrition into the life cycle assessment of food is important because the primary function of food is to provide adequate nutrition. The UN Sustainable Development Goals (SDGs) include both ensuring good nutrition and combating environmental degradation (Figure 1). For example the Nordic Nutrition Recommendations also aim to consider environmental impacts alongside nutritional considerations. The integration of nutrition into the functional unit improves the reliability and usability of food life cycle assessment, especially when environmental impacts are considered from a consumption perspective.

Recommendation 2

Continue to allow for the simultaneous consideration of environmental and nutritional aspects of products in consumer communications through appropriate legislation

Much of the development work to reduce environmental impacts takes place in the production chains, but consumers are a key motivator for development. Consumers need reliable and useful information to support their sustainable purchasing decisions. Life cycle assessment is the most widely used method for generating that information.

It is important that EU legislation allows for environmental communication of food based on the simultaneous consideration of environmental and nutritional aspects, which will make food comparisons more holistic, reliable and supportive of sustainability (see the rationale for Recommendation 1). The use of nutritional functional units is a key means of integrating nutrition into life cycle assessment.

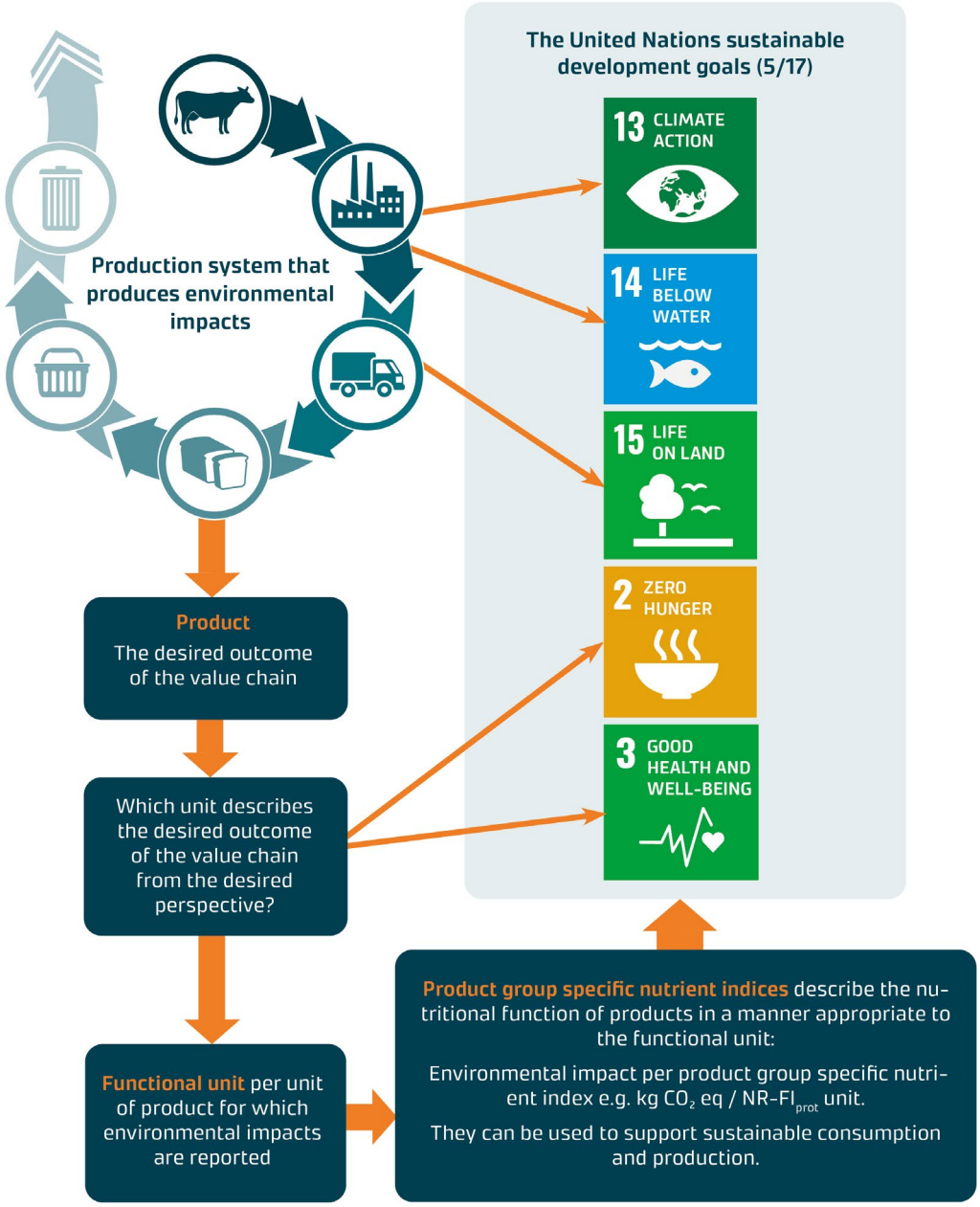

Figure 1 | Life Cycle Assessment (LCA) reports the environmental impacts of a product, expressed per functional unit of the product. Often, defining the functional unit is a challenging task. Nutritional functional units combine the nutritional function of a food with the assessment of the environmental impact of food, following the principles of LCA. They provide a practical tool for generating food sustainability information that addresses the UN Sustainable Development Goals on nutrition and the environment. Product group-specific nutrient indices, such as the NR-FI indices, which are appropriate for Finnish cuisine, include several nutrients. By using them in a functional unit, sustainable consumption and production can be supported in a more comprehensive way than by looking only at one nutrient, such as protein, or at the mass or volume of a product.

Recommendation 3

Promote eco-labelling of food products in Finland and the EU based on the use of product group-specific nutrient indices

Currently, there is no official eco-labelling of food products in the EU that describes the environmental impact of a product, either for a single or for multiple impacts. Such labelling would be needed to support consumers' consumption decisions (see the rationale for Recommendation 2).

Finland, an EU Member State, has been at the forefront globally in developing a methodology to link nutrition to life cycle assessment in a transparent way. The EU is therefore well placed to promote its use in eco-labelling. To take this forward, labelling needs to be piloted and research into its effectiveness is needed.

Recommendation 4

Food companies actively and consistently use the nutrient indices developed in their product life cycle assessments and use the information obtained in consumer communications, within the limits of the legislation

Companies' product development plays an important role in promoting the sustainability of products. Life cycle assessment is used by companies to assess the potential for reducing environmental impacts. It also highlights which measures are most effective, those that are targeted at the company's own operations or those that are targeted at the production chain.

The integration of a nutritional perspective into the life cycle assessments carried out by companies allows for a simultaneous examination of environmental impacts and nutritional quality and the development of parallel improvement actions. This is important because both aspects are central to the sustainability of the food system.

Why do we recommend the use of nutrient indices?

Food consumption provides a wide range of benefits, which makes it challenging to define a functional unit for the life cycle assessment. However, if we are interested in a sustainable lifestyle, nutrition is highlighted: food is needed to provide good nutrition, which is in itself part of sustainability (Figure 1).

Although we often talk about sustainable sources of protein, for example, food is not just a source of a single nutrient. Nutrient indices include multiple nutrients and are therefore suitable for describing the nutritional role of food in a broader sense than as a source of a single nutrient.

The use of nutrient indices as a functional unit of life cycle assessment changes the final results. For example, the nutritional functional unit shows how the climate impact of foods made from whole grains is much lower in relation to the nutritional function of the product than the climate impact of foods made from white, hulled grains. In Figure 2, this is particularly evident for rice (white) and whole grain rice and pasta (white) and whole grain pasta.

The nutrient indices developed for each product group consider the nutrient content of products as part of the overall diet. This is based on research-based information on the nutrients that each product group provides. The starting point is somewhat conservative as it is based on current diets and food consumption patterns. However, the research also shows that diets change relatively slowly, so a conservative approach is justified when looking at the whole population.

The method can also be flexible as diets change and can be used to anticipate how dietary change will be reflected in the nutritional role of product groups. These issues are essentially research questions that need to be carefully considered. In order to maintain comparability and reliability, companies should base their own product evaluations on common principles rather than establishing their own methodologies.

In the future, it may also be possible to use the method to apply planetary boundaries to food. The first steps have already been taken.

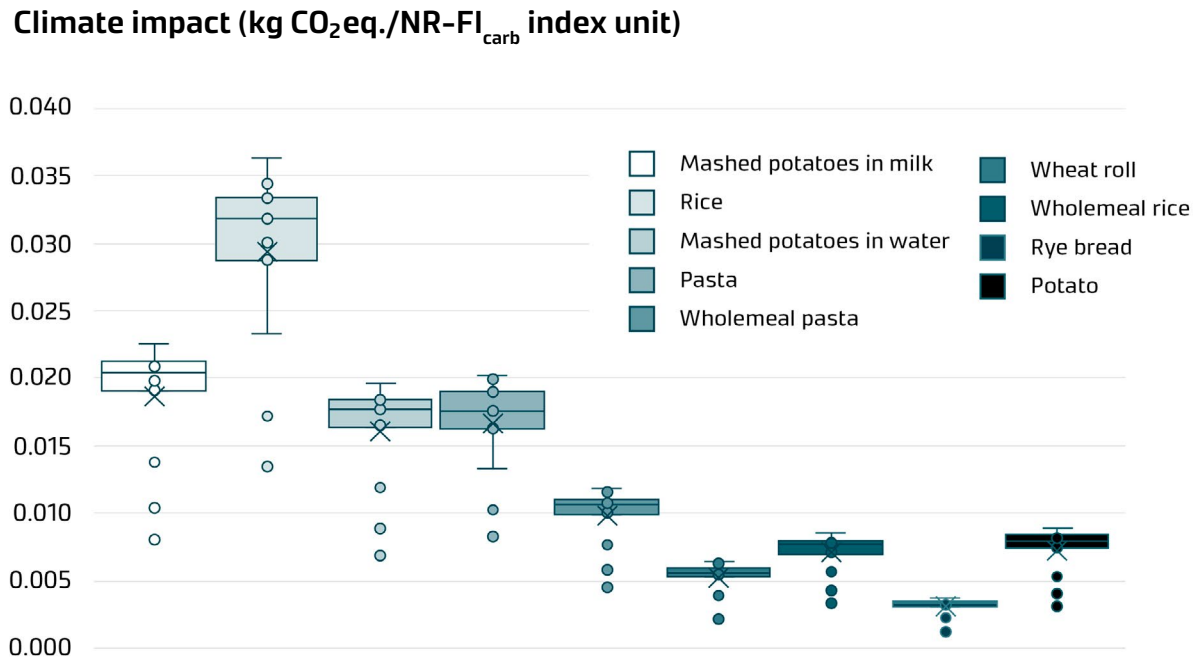

Figure 2 | Application of the nutritional functional unit to assess the climate impact of carbohydrate sources. Differences in the nutritional quality of the products are particularly evident in the results for rice (white) and whole grain rice and pasta (white) and whole grain pasta. There is little difference in the climate impact of whole grain and white products when considered per unit mass. The dots below the bars show the results for the lowest age groups. The method is based on nutrient intake recommendations, which are different for different age groups. Therefore, the final results will vary between age groups.

Lisätietoa:

Natural Resources Institute Finland, Luke, developed together with the University of Helsinki and the University of Eastern Finland nutritional functional units in the NEPGa project. Scientific publications and further information on the project are available on the website: https://www.luke.fi/en/projects/nepga

Authors:

Merja Saarinen, Marjukka Kolehmainen, Anne-Maria Pajari, Venla Kyttä, Marita Kettunen

Contact:

merja.saarinen@luke.fi
marjukka.kolehmainen@uef.fi
anne.maria.pajari@helsinki.fi
venla.kytta@luke.fi
marita.kettunen@luke.fi

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