D4.2

Nutritional database and web application

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Final

Pathways
FOR SUSTAINABLE FOOD

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[2] Public (PU), Restricted to other programme participants including EC (PP), Restricted to a group specified by the consortium including the EC (RE), Confidential, only for members of the consortium including EC (CO)

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Executive Summary

The PATHWAYS project aims to promote sustainable food systems in Europe by developing practical tools that support healthier and more environmentally friendly dietary patterns. As part of Work Package 4, Deliverable 4.2 presents the development and implementation of Foodbasket7, a web-based application designed to evaluate weekly diets from both nutritional and environmental perspectives.

Foodbasket7 enables users to build a weekly food basket by selecting from over 1,600 food items, drawn primarily from the French CIQUAL database. Based on the user's profile (age, sex, physical activity), the tool calculates recommended daily intakes for 28 essential nutrients. Simultaneously, environmental impacts are assessed using the AGRIBALYSE database and its 16 Product Environmental Footprint (PEF) indicators, offering a comprehensive view of sustainability.

The tool produces two core synthetic scores, one for nutritional adequacy and one for environmental impact, alongside detailed graphs and color-coded visual feedback to guide user decisions. A unique feature of Foodbasket7 is its focus on full weekly diets rather than individual foods, enabling a more holistic assessment without stigmatizing specific food groups. In particular, the tool helps clarify the role of animal-based products in achieving a balanced and sustainable diet.

Designed to be accessible to the general public, Foodbasket7 serves multiple audiences: consumers, educators, researchers or policymakers. It combines scientific robustness with a user-friendly interface and visual language, allowing for experimentation, self-reflection, and learning.

The development process involved technical modelling, user interface design, and extensive testing to ensure coherence with the goals of the PATHWAYS project. By helping users understand the trade-offs between health and environmental outcomes, Foodbasket7 contributes to the broader mission of supporting dietary transitions across Europe.

The tool is freely available online at foodbasket7.ifip.asso.fr , and its methodology and scoring systems are fully documented in this deliverable.

1. Introduction

The transition toward sustainable food systems requires a careful balance between nutritional adequacy and environmental responsibility. In this context, the Work Package 4 (WP4) of the PATHWAYS project focuses on understanding consumer dietary behaviour, nutritional needs, and the environmental implications of food choices across Europe. Deliverable 4.2, "Nutritional Database and Web Application", aims to operationalise this vision by developing a dual-purpose tool: a comprehensive nutritional and environmental database, and a web application that enables users to construct and assess personalised weekly food baskets based on their preferences and sustainability goals.

This deliverable responds to the growing need for tools that support both consumers and stakeholders (e.g., researchers, policymakers, educators) in navigating the complexity of sustainable diets. The database integrates nutritional data from the French CIQUAL food composition table with environmental data from the AGRIBALYSE life cycle assessment database. Together, these sources cover over 2,500 food items and enable a simultaneous evaluation of nutrient content and environmental footprint.

We developed a web application called ***Foodbasket7***, where individuals can select food items from a list based on the French food databases. This web application is designed to translate this information into an intuitive and interactive format. It empowers users to build weekly food baskets and receive immediate feedback on their nutritional value and environmental impact. Rather than recommending an optimised "ideal" basket, the tool allows users to explore different combinations based on their dietary habits, cultural preferences, and individual goals.

This introduction outlines the purpose, context, and ambition of Deliverable 4.2. The following sections present the methodology used to develop the nutritional and environmental databases, describe the design and structure of the *Foodbasket7* web application, and provide examples of how this tool can be used to support healthier and more sustainable food choices.

To explore the tool developed as part of this initiative, visit:

foodbasket7.ifip.asso.fr

2. Methodological Framework

2.1 Nutritional dimension

SELECTION OF THE CIQUAL DATABASE

The CIQUAL database (Centre d'Information sur la Qualité des Aliments) is a comprehensive food composition database managed by the French Agency for Food, Environmental and Occupational Health and Safety (ANSES) (Ciqual, 2020). It provides detailed nutritional information on a wide range of foods consumed in France, serving as a critical resource for researchers, healthcare professionals, policymakers, and the food industry.

CIQUAL includes robust data on macronutrients, micronutrients, and other key dietary components for over 3,000 food items. While other food composition databases exist across the EU—such as the German Nutrient Database (BLS), the UK's McCance and Widdowson's dataset, or EuroFIR's FoodEXplorer—CIQUAL was selected for this study due to its direct compatibility with the AGRIBALYSE environmental database. In particular, it includes all 2,500 foods for which environmental impacts are also reported in AGRIBALYSE (see section 2.2), allowing for seamless integration of nutritional and environmental data via a shared food item identification system. This alignment facilitates a consistent and harmonised assessment framework essential for a multi-criteria evaluation of food baskets.

However, its limitations must also be acknowledged. The database is restricted to foods consumed in France and does not include all nutrients of interest—such as amino acids or detailed anti-nutritional factors—thereby constraining the scope of our nutritional analysis. To compensate for certain gaps, particularly phytate content, we supplemented our data with values from the FAO/INFOODS/IZiNCG Global Food Composition Database for Phytate (Dahdouh et al., 2019). The Ciqual database also contains missing values for certain nutrients in certain food items. To fill these gaps, ANSES has made available a blank-free database called CALNUT. This database was selected to provide comprehensive information for all food items (ANSES 2020).

CRITERIA FOR NUTRIENT SELECTION

The selection of nutrients for analysis was guided by current literature, focusing on 28 nutrients, with a core emphasis on 20 considered essential for public health. These include both macro- and micronutrients such as energy, protein, total fats, iron, calcium, zinc, iodine, selenium, magnesium, potassium, choline, and a wide range of vitamins (A, B-complex, C, D, E, K) and fatty acids (linoleic acid, alpha-linolenic acid, eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), arachidonic acid). Particular attention was given to nutrients where deficiencies are common or where availability significantly varies across dietary patterns. Efforts were made to contextualize nutrient availability within animal-sourced versus plant-based dietary profiles to reflect realistic nutritional trade-offs.

Animal-sourced foods (ASFs) remain the most concentrated and bioavailable sources of many of these nutrients. Meat, eggs, dairy, and fish provide nearly exclusive access to vitamin B12 and long-chain omega-3 fatty acids (EPA and DHA), which are either absent or poorly converted from plant precursors in human metabolism. A recent global assessment demonstrated that ASF-rich diets substantially increase nutrient adequacy, particularly for vulnerable populations such as children, pregnant women, and the elderly (Adesogan et al., 2020). Furthermore, key micronutrients such as iron and zinc are far more efficiently absorbed from ASFs than their plant-based counterparts, reducing the risk of chronic deficiencies despite lower food intake (Murphy & Allen, 2003).

CONSIDERATION OF NUTRIENT BIOAVAILABILITY AND AMINO ACID DIGESTIBILITY

Recognising that total nutrient content does not equate to physiological benefit, we integrate bioavailability adjustments of some nutrients, and Digestible Indispensable Amino Acid Score (DIAAS) into our analysis, and within the ***Foodbasket7*** app, as outlined below.

Nutrient bioavailability

Nutrient bioavailability—defined as the proportion of ingested nutrients that is absorbed and utilised by the body—can vary greatly depending on dietary matrix and individual physiological factors. For key minerals such as iron and zinc, whose absorption is highly influenced by dietary composition, we applied algorithms that account for inhibitory and enhancing components in the diet, such as phytates and vitamin C. This methodological adjustment allows for a more realistic and functionally relevant assessment of nutritional adequacy within each dietary model (Hurrell, 2002).

In this context, the individual diet approach is used to assess iron and zinc bioavailability. This approach accounts for intra-individual variation by applying bioavailability factors derived from the specific composition of each participant's diet. **Non-heme iron absorption** will be estimated using a diet-based predictive algorithm developed by Armah et al. (2013), which integrates key dietary enhancers and inhibitors of iron absorption, including serum ferritin (SF), vitamin C (C), meat/fish/poultry (MFP), tea (T), phytate (P), calcium (Ca), and non-heme iron (NH). In the absence of individual SF data, a fixed value of 15 µg/L—

representing the WHO cut-off for depleted iron stores—is employed to reflect maximal absorption potential and isolate dietary influences (Armah et al., 2013). The phytate contents will be retrieved from the FAO/INFOODS/IZiNCG Global Food Composition Database for Phytate (Dahdouh et al., 2019)

$$\ln(\%\ non-heme\ iron\ absorption) = 6.294 - 0.709\ln(SF) + 0.119\ln(C) + 0.006\ln(MFP + 0.1) - 0.055\ln(T + 0.1) - 0.247\ln(P) - 0.137\ln(Ca) - 0.083\ln(NH)$$

With SF: serum ferritin (µg/L), C: vitamin C (mg), MFP: meat, fish, and poultry (g), T: tea (number of cups), P: phytate (mg), Ca: calcium (mg), and NH: nonheme iron (mg).

Heme iron absorption is estimated for each individual diet using the following equation (Hallberg & Hulthén, 2000):

$$Log(\%\ heme\ iron\ absorption) = 1.9897 - 0.3092\log(SF)$$

The total iron absorption is calculated as follows:

$$Total\ iron\ absorption = \frac{(heme\ iron\ intake \times \%heme\ iron\ absorption) + (non-heme\ iron\ intake \times \%non-heme\ iron\ absorption)}{total\ iron\ intake} \times 100$$

For zinc, total absorbed zinc (TAZ) is estimated using the algorithm by Miller et al. (2007), which models **zinc absorption** as a function of total dietary zinc (TDZ) and phytate (TDP) content, accounting for the strong inhibitory effect of phytate on zinc bioavailability. The ratio TAZ/TDZ is used to calculate fractional zinc absorption (Miller, Krebs, & Hambidge, 2007).

$$TAZ = 0.5 \times \left\{0.13 + TDZ + 0.10\left(1 + \frac{TDP}{1.2}\right) - \sqrt{\left(0.13 + TDZ + 0.10\left(1 + \frac{TDP}{1.2}\right)\right)^2 - 4 \times 0.13 \times TDZ}\right\}$$

With TAZ: total absorbed zinc (mmol), TDZ: total dietary zinc (mmol) and TDP: total dietary phytate (mmol). Zinc absorption is then calculated as the ratio TAZ/TDZ.

The tool uses the Dietary Pattern Approach to estimate recommended intakes, applying standardized bioavailability factors as proposed by EFSA. Specifically, iron bioavailability is assumed to be 16%, reflecting a diet rich in meat and fish and low in phytates. Zinc absorption is based on an assumed intake of 300 mg phytate per day—typical of a Western diet (Allen, Carriquiry, & Murphy, 2020). A more individualised approach to estimating iron and zinc bioavailability will be incorporated into the tool in the coming months by integrating the previous equations into the tool. Indeed, the interest of a tool like Foodbasket7 is to reason on the scale of a food basket and not of an isolated food. By considering the interactions between all the nutrients in the diet, we can specify the bioavailability and therefore the nutritional contribution of the food basket.

Digestible Indispensable Amino Acid Score (DIAAS)

Digestible Indispensable Amino Acid Score (DIAAS) is a method for evaluating the protein quality of foods (FAO/WHO, 2013). It replaces the previous Protein Digestibility Corrected Amino Acid Score (PDCAAS) and is a more accurate measure of protein quality because it considers how well the essential amino acids in a protein are digested and absorbed. It uses the true ileal digestibility of each essential amino acid, which measures how much of each amino acid is absorbed in the small intestine. A DIAAS score of 100% or more indicates a high-quality protein, while lower scores suggest a protein with a less complete amino acid profile or lower digestibility (FAO/WHO, 2013).

To quantify the DIAAS, the following data are necessary:

- Amino acid composition of the food: The content of each indispensable (essential) amino acid or IAA in the food item, usually expressed in milligrams per gram of protein (mg/g protein).
- Ileal digestibility of each indispensable amino acid: The percentage of each indispensable amino acid that is absorbed in the ileum (the final section of the small intestine).
- Reference amino acid requirements: The indispensable amino acid requirements for a specific age group, typically expressed in milligrams per gram of protein (mg/g protein). These reference values are provided by organizations such as the Food and Agriculture Organization (FAO) (FAO/WHO, 2013)

The DIAAS can be quantified using the following formulas (FAO/WHO, 2013). First, the digestible IAA content and the digestible IAA reference ratio will be calculated for all applicable amino acids.

$$digestible\ IAA\ content = IAA\ content\ \times Ileal\ digestibility$$

$$digestible\ IAA\ reference\ ratio = \frac{digestible\ IAA}{IAA\ in\ reference\ protein}$$

With digestible IAA content in mg/g protein, IAA content in mg/g protein, ileal digestibility without unit, and IAA in reference protein in mg/g protein.

Next, the DIAAS can be calculated as the lowest calculated digestible IAA reference ratio of all IAA, expressed as a percentage:

$$DIAAS\ \% = 100 \times lowest\ value\ \text{(digestible IAA reference ratio)}$$

The tool will support the quantification of the DIAAS for user-defined diets. This functionality, scheduled for implementation in the coming months, will utilize amino acid composition and ileal digestibility coefficients as reported by Muleya et al. (2021) and FAO (1970)..

NUTRIENT REFERENCE VALUES AND HARMONIZATION

To ensure comparability and scientific rigor, nutrient adequacy was assessed against harmonized dietary reference values (DRVs) (Allen, Carriquiry, & Murphy, 2020). These were primarily drawn from the European Food Safety Authority (EFSA), and incorporated international frameworks such as those from the Institute of Medicine (IOM). Harmonisation of reference values allows for the consistent evaluation of dietary scenarios across geographic contexts and enhances the policy relevance of our findings.

In summary, by combining the CIQUAL and AGRIBALYSE databases, harmonising reference values, and adjusting for nutrient bioavailability, our framework provides a nuanced and comprehensive assessment of the nutritional dimension of dietary choices. This approach supports the development of food baskets that are not only nutritionally adequate but also environmentally sustainable and contextually relevant.

LIMITATIONS

It is important to note the potential challenges and limitations that we faced in this project. The construction of food baskets is contingent on the available data, which might not capture the full range of food items representative of each dietary philosophy. While the CIQUAL database provides extensive nutritional data,

there can be variability in nutrient content due to factors such as, raw matter composition (e.g. variability induced by differences in primary production practices), processing methods and cooking techniques.
To address data gaps, CIQUAL also provides the CALNUT table, which offers a version of the food composition database without missing values. However, users should be aware that CALNUT includes automatically imputed values that do not meet the standard quality criteria applied to the official CIQUAL table.

2.2 Environmental dimension

Understanding the environmental impacts of our dietary choices is crucial for designing sustainable diets. To achieve this, the PATHWAYS project will calculate the environmental trade-offs associated with food baskets.

SELECTION OF THE AGRIBALYSE DATABASE

The selected database to assess the environmental impact of consumed foods is AGRIBALYSE, provided by ADEME (The French Agency for Ecological Transition). AGRIBALYSE is the most comprehensive public French database on the environmental impacts of food products, based on Life Cycle Assessment (LCA) methodologies aligned with the Product Environmental Foodprint (PEF) method. The main coverage is agricultural products (over 200) and processed foods (more than 2,500) produced and consumed in France. Although some other LCA databases exist at the European level such as the HESTIA database, AGRIBALYSE was chosen for its food-specific coverage, open-access nature, and its direct integration with the CIQUAL database. This integration enables product-level linkage between environmental and nutritional data, which is crucial for a robust, consistent, and operational multi-impact assessment of food baskets. Both agricultural products (e.g. fresh chicken breast and apples) and processed foods (e.g. sausages and apple sauce) are represented within the database. The database also covers frequently consumed food products in France that are imported, such as coffee, bananas, and chocolate (AGRIBALYSE, 2024).

The methodology used to quantify the environmental impact is the standardised and mature LCA. This methodology compiles and evaluates the inputs (e.g., material and energy), outputs (e.g., polluting emissions), and potential environmental impacts of a product or service along its life cycle as recommended by ISO 14044 (ISO, 2006a, 2006b). This life cycle is completely covered in AGRIBALYSE. It entails the farm production, processing, transport and logistics, packaging, consumption or usage, and recycling or end of life, see Figure 1 (AGRIBALYSE, 2024). LCA is an iterative approach consisting of four steps: 1) goal and scope definition, 2) inventory analysis, 3) impact assessment, and 4) interpretation. The first step includes the goal and the scope of the study. The goal describes the intended application, the reasons for conducting the research, the intended audience, and the comparative character of the results. The scope comprises the investigated production system and several decisions regarding it. The inventory analysis covers the data gathering, such as which and how many inputs are needed to provide a predefined product unit. The impact assessment translates the inventory results into environmental impact results. In this step, decisions are made on which categories will present the environmental impact (this will be further elaborated in the next section). The last step, interpretation, involves evaluating the results of the inventory and the impact assessment together. This step provides a general conclusion, explains limitations, and provides recommendations for future research (ISO, 2006a). Although the Life Cycle Analysis (LCA) method used in the AGRIBALYSE database integrates numerous environmental impacts, consideration of biodiversity remains partial, due to difficulties in assessing the effects of food systems on biodiversity in a complete and standardized manner.

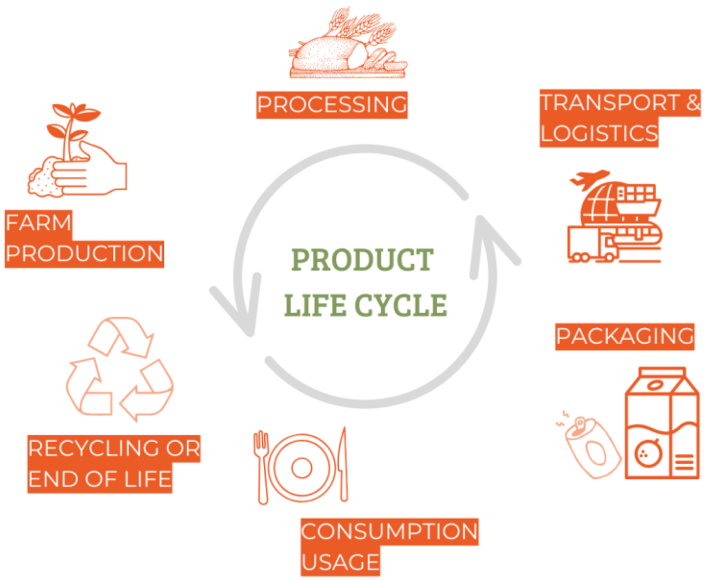

Figure 1. The life cycle of the food products in AGRIBALYSE. Retrieved from AGRIBALYSE (2024).

DIFFERENT ENVIRONMENTAL CATEGORIES USED

In this tool, a wide range of environmental issues is considered to provide a comprehensive environmental analysis by using the Environmental Footprint (EF). This methodology is a standardised approach recommended by the European Commission. It addresses 16 impact categories and an aggregated single score (European Commission, 2025; Sala, Cerutti, & Pant, 2018). The single score is created by normalising and weighting these 16 impact categories, summarizing the overall environmental impact of a product or service. This single score allows for easy comparison and benchmarking of different products or services, facilitating informed decision-making and promoting environmentally sustainable choices (Sala, Cerutti, & Pant, 2018). An overview and description of these categories and the single score are presented in Table 1. These categories represent the latest scientific knowledge and best practice through periodic updates (European Commission, 2025).

Table 1. The environmental impact categories, units, and description within the Environmental Footprint methodology (European Commission, 2025; Sala, Cerutti, & Pant, 2018).

Environmental category	Unit	Description
Climate change	kg CO2 eq	Climate change is caused by the build-up of greenhouse gases like CO_2 and methane in the atmosphere. These gases come from human activities such as farming, transportation, industry, and deforestation. This indicator measures how much a product contributes to global warming.
Ozone depletion	kg CFC11 eq	The ozone layer protects life on Earth by blocking harmful ultraviolet rays from the sun. Some industrial gases, such as chlorofluorocarbons, can damage this layer. This indicator assesses whether a product or activity contributes to the depletion of the ozone layer, which can lead to increased health risks (e.g., skin cancer) and harm to ecosystems.
Ionising radiation	kBq U-235 eq	Some energy and industrial processes release ionizing radiation, especially in the nuclear sector. This indicator estimates the potential human health risks from exposure to these radiations, including through the environment or food chain.
Photochemical ozone formation	kg NMVOC eq	When pollutants like nitrogen oxides or volatile organic compounds react with sunlight, they form ozone at ground level—a pollutant that irritates lungs and affects animals and plants. This indicator measures a product's contribution to respiratory issues due to photochemical smog.
Particulate matter	disease inc.	Tiny airborne particles can originate from vehicles, industries, heating systems, or even agriculture. When inhaled, they can cause severe respiratory and cardiovascular diseases. This indicator shows the adverse impact of a product on public health.
Human toxicity, non-cancer	CTUh	Other substances may not cause cancer but are still toxic to human health, such as endocrine disruptors or solvents. This indicator measures how a product might contribute to illnesses like asthma, hormonal disorders, or neurological issues.

Human toxicity, cancer	CTUh	Some pollutants released into the environment are known to increase the risk of cancer in humans. This includes substances like dioxins or certain heavy metals. This indicator estimates a product's potential to expose people to carcinogens through air, water, and soil.
Acidification	mol H+ eq	Certain emissions (SO_2, NOx, NH_3) mix with rain and fall as acid rain, which can degrade soils, forests, and aquatic ecosystems. This indicator reflects how a product contributes to the acidification of natural environments, which affects, amongst others, biodiversity and agricultural productivity.
Eutrophication, freshwater	kg P eq	When too many nutrients (like nitrogen or phosphorus) are released into rivers and lakes, they promote algae growth or specific plants. These algae deplete oxygen, killing fish and other aquatic life. This indicator measures whether a product contributes to such pollution.
Eutrophication, marine	kg N eq	Similar to freshwater eutrophication, but in oceans and coastal waters. Excess nutrients can lead to algae overgrowth or "dead zones" where marine life cannot survive. This indicator tracks a product's impact on these marine imbalances.
Eutrophication, terrestrial	mol N eq	Too many nutrients (especially nitrogen) on land can disrupt plant ecosystems, favouring some species and harming others in the original ecosystem. This indicator assesses how a product contributes to the over-fertilization of soils, reducing biodiversity.
Ecotoxicity, freshwater	CTUe	When certain chemicals enter rivers, lakes, or other freshwater bodies, they can be toxic to aquatic animals and plants. This indicator evaluates how a product may pollute water bodies with substances like pesticides, metals, or pharmaceutical residues.
Land use	Pt	Producing food and goods often requires space, leading to the use and transformation of land. This indicator measures the pressure on land and ecosystems, including biotic production, erosion resistance, groundwater regeneration, and mechanical filtration.
Water use	m3 depriv.	Water is a precious and unevenly distributed resource. In some regions, overuse leads to water scarcity and competition between agriculture, households, and nature. This indicator shows how much freshwater a product consumes, especially in areas where water is already limited.
Resource use, fossils	MJ	Coal, oil, and gas are finite resources that power most of today's industries—but they're being used faster than they can be replaced. This indicator estimates a product's dependence on non-renewable energy sources and its role in depleting fossil fuel reserves.

Resource use, minerals and metals	kg Sb eq	Many products rely on non-renewable raw materials like iron, copper, lithium, or rare earths. This indicator tracks how much of these resources are used relative to known reserves.
Single score	Pt	This score aggregates all 16 impact categories that summarize the overall environmental impact.

MATCHING PRODUCTS BETWEEN AGRIBALYSE AND CIQUAL

The integration of the CIQUAL 2020 (Ciqual, 2020) and AGRIBALYSE v3.2 (AGRIBALYSE, 2024) databases was chosen due to their alignment in food categorisation and standardised ingredient nomenclature, as well as their shared use of a consistent unique identifier system, which facilitates precise product-level matching. Beyond these structural compatibilities, combining both databases leverages their complementary strengths: AGRIBALYSE provides robust LCA-based environmental impact data, while CIQUAL offers detailed and up-to-date nutritional composition data. This synergy enhances overall data coverage by including food items unique to each database and enables cross-validation to improve data quality. Additionally, both databases reflect foods produced and consumed within the French context, ensuring regional relevance and consistency. The combined use supports integrated, multidimensional analyses that assess nutritional quality alongside environmental impacts, which is critical for comprehensive sustainability assessments.

LIMITATIONS

Next to nutritional dimension limitations, the environmental dimension is restricted to the data and its quality in the used database. The environmental trade-off calculations rely on AGRIBALYSE, which, although comprehensive, is not exhaustive and specific for products on the French market and therefore limits accurate extrapolation to some other regions in Europe. The products in the database are rather average and do not cover a large degree of variability related to production system, food composition, food preparation, food waste, etc. For instance, the impact of beef meat is based on the weighted impact of this meat from various animal husbandry systems sold on the market. Also, alternative production systems such as organic farming are not in the database. Moreover, the most applicable inventory data set is for some foods unavailable, and proxies are utilised; for instance, salmon production.

3. Development of the Web Application "Foodbasket7"

3.1 Description of the tool

TOOL OBJECTIVES

The main objective of Foodbasket7 is to provide an interactive tool, accessible to the general public, that captures the dual nutritional and environmental dimensions of food. The application's development was based on three fundamental principles:

- Ease of use: Offer a simple, intuitive, and user-friendly interface to ensure rapid learning, without the need for specific technical knowledge.
- Personalisation: Allow results to be adapted based on the user's individual characteristics (age, gender, physical activity level).
- Integrated dual assessment: Combine nutritional data from the CIQUAL database and environmental impacts from the AGRIBALYSE database to produce a comprehensive assessment of food baskets.

STRUCTURE AND MAIN FEATURES

Foodbasket7's architecture is based on a dynamic web application connected to a centralized database containing information from several databases (CALNUT 2020, Agribalyse 3.2, DRVs Finder).

The tool consists of several functional modules:

- User Profile Module: Collection of personal information for the automatic calculation of reference nutrient requirements (according to EFSA values), with the ability to modify this information at any time.
- Food Basket Construction Module: The user can select the foods consumed over 1 to 7 days, across four typical meals per day. Foods are added via a search interface with category filters and favourites. Each portion can be modified.

- Nutritional Analysis Module: Automated calculation of the adequacy of intakes of 28 essential nutrients, divided into four groups (general, fatty acids, vitamins, minerals), with an overall nutritional performance score.
- Environmental Analysis Module: Automated calculation of environmental scores based on the 16 Product Environmental Footprint (PEF) indicators, organized into three broad impact categories. A summary score also aggregates the environmental impact of the food basket.
- Advanced customisation module: allows manual modification of food characteristics (quantity, nutritional or environmental values) to simulate personalized or non-referenced foods.
- User dashboard: view and manage created baskets, compare nutritional and environmental scores, and duplicate or delete existing baskets.

3.2 Visual identity of the tool

The tool's entire graphic identity complies with the PATHWAYS project's graphic charter, incorporating its colour codes and visual styles. This graphic consistency allows for harmonious integration into the project's ecosystem and strengthens the tool's institutional recognition.

To make the tool identifiable and accessible to as many people as possible, a specific name was created: **Foodbasket7**. This name directly evokes the creation of a food basket on a weekly basis for seven days, consistent with objectives of the tool. A logo was also developed: it depicts a basket containing a couple of foods, visually illustrating dietary diversity while remaining simple and evocative.

Foodbasket7
FOR SUSTAINABLE DIETS

Figure 2. Name and logo of the tool

The tool is accompanied by the slogan "for sustainable diets" echoing the full name of the European PATHWAYS project: "Pathways for Sustainable Food". This slogan reinforces Foodbasket7's main objective: to support consumers towards more sustainable diets, both nutritionally and environmentally.

3.3 User-friendly interface

The development of the Foodbasket7 web application is based on a user-centric approach, combining technical robustness, ease of use, and clear results. The tool was designed to be accessible to the general public, while meeting the requirements of scientific rigor in the processing of nutritional and environmental data.

TECHNICAL ARCHITECTURE

The Foodbasket7 application was developed using modern web technologies, allowing for smooth and interactive navigation. The interface is based on a responsive architecture, compatible with major browsers, although not adapted to the smartphone format. Data hosting is secure with user account authentication.

The tool also integrates a user profile management system, which allows for the storage of nutritional needs and customised food items.

ERGONOMIC DESIGN

The interface design was guided by user-centered design principles and underwent internal user testing to ensure rapid adoption. Emphasis was placed on intuitive navigation, clear menu organisation, and standardised visual codes (colours, gauges, icons).

The user is guided step by step, from defining their profile to viewing detailed results. Each action (adding a food item, modifying a portion, viewing a score) is accompanied by immediate and contextualised visual feedback. Visual aids, tooltips, legends, and explanatory texts accompany more technical elements to facilitate the understanding of the results by non-expert audiences. Finally, error messages help limit errors and misunderstandings.

The nutritional and environmental results are presented through a dual-entry system: a summary (via two global indices) and a detailed analysis (by nutrient or by impact indicator). Interactive graphs, intuitive colour coding, and educational sheets associated with each variable reinforce the educational dimension of the tool.

Finally, a "dashboard" section allows the user to manage several food baskets, compare them and track their changes over time, in a logic of progressive learning and support for dietary change.

3.4 Simple scoring system

To make the results accessible, comparable, and easily interpretable, Foodbasket7 relies on a dual scoring system:

- An individual score for each essential nutrient and each environmental indicator.
- A summary score, composed of two overall indices: a **nutritional index** and an **environmental index**.

To visually indicate to the user the nutritional or environmental performance of their basket, a 6-colour scale has been created (from dark red to dark green).

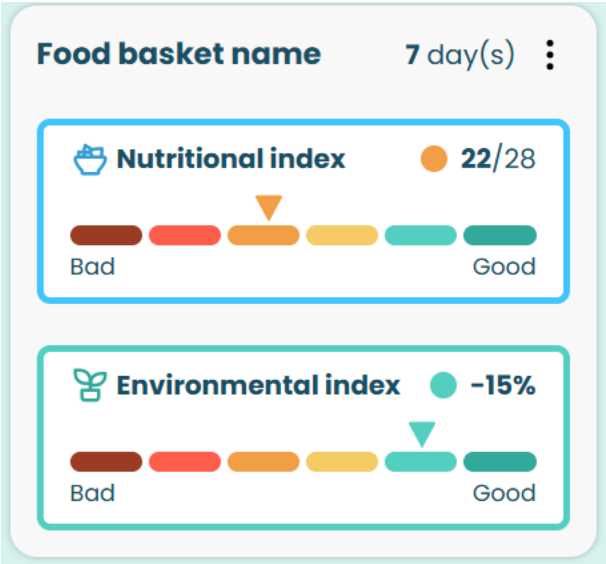

Figure 3. Nutritional index and environmental index in the dashboard

These two overall indices are systematically displayed in the dashboard for each food basket created, allowing for a rapid assessment of its overall performance.

NUTRITIONAL SCORING SYSTEM

For essential nutrients

For each of the 28 essential nutrients, the tool displays:

- the daily intake value of the basket;
- an adequacy percentage based on the user's profile;
- and a colour bar visually indicating the position of this intake.

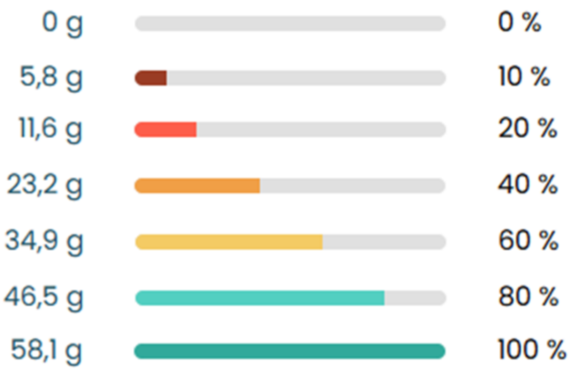

Figure 4. Example of colour bar for the essential nutrients

The progress percentage (0%-100%) of the bar is defined, for each nutrient, based on the following formula:

$$\frac{Nutritional\ contribution}{Dietary\ reference\ value}\ \text{(between 0\% and 100\%)}$$

The colour of the bar is defined according to the Table 2. Nutrients colour bar thresholds:

Table 2. Nutrients colour bar thresholds

Colour	Threshold	Interpretation	Value for nutritional index calculation
Dark red	0 - 19%	Critically insufficient intake	+0
Light red	20% - 39%	Insufficient intake	+0
Orange	40% - 59%	Problematic intake	+0
Yellow	60% - 79%	Intake needs improvement	+0
Light green	80% - 99%	Intake just below recommendations	**+1**
Dark green	≥ 100%	Ideal intake, in line with recommendations	**+1**
Dark red	≥ Upper limit	Excessive intake, above the upper limit	+0

Please note that non-essential nutrients do not have a colour bar but have the daily intake value of the food basket.

For the nutritional index

The **nutritional index** aims to summarise the level of adequacy of the food basket to meet the user's nutritional needs. It is based on an analysis of the intake of the 28 essential nutrients, divided into four categories: general nutrients, fatty acids, vitamins, and minerals.

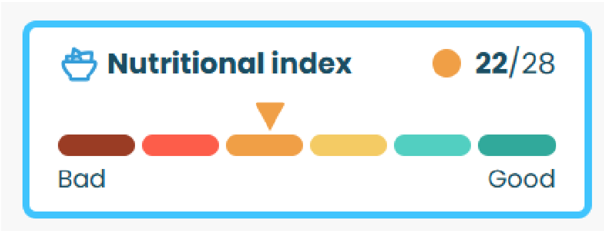

Figure 5. Example of colour bar for the nutritional index

For these 28 nutrients, the tool counts how many fall within the 'non-deficiency' range - defined as providing more than 80% of the recommended intake (light green and dark green zones) - to generate a score ranging from 0 to 28.

Table 3. Nutritional index thresholds

Colour	Level	Interpretation
Dark red	0 - 9	Most or all essential nutrients are lacking, exposing people to a critical risk of serious nutritional deficiencies
Light red	10 – 14	Many essential nutrients are lacking, exposing them to a high risk of nutritional deficiencies
Orange	15 – 19	A significant proportion of basic needs is not met, increasing the risk of nutritional imbalances and deficiencies
Yellow	20 - 23	The majority of needs are met, but targeted deficiencies can still compromise nutritional balance
Light green	24 – 26	The diet is generally balanced, with some adjustments necessary to optimize nutritional coverage
Dark green	27 - 28	All or almost all essential nutrient needs are met, supporting good overall health and preventing deficiencies

This score thus makes it possible to translate the overall nutritional balance of the basket into a single numerical value, while providing access to details by nutrient. Colour bars and visual thresholds make it easier to read for non-specialists.

ENVIRONMENT SCORING SYSTEM

For environmental indicators

For each of the 16 environmental indicators, the tool displays:

- the daily impact of the basket.
- the unit of the indicator;
- and a colour bar visually indicating the position of this impact.

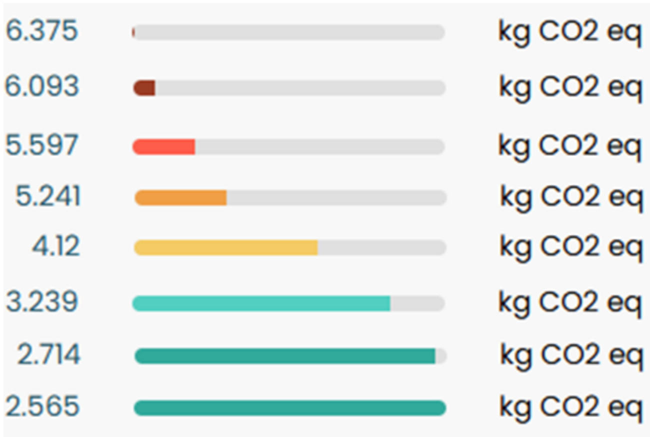

Figure 6. Example of colour bar for the environmental indicators

The colour code that is attributed to the diet is based on the environmental impact of French diets of adults retrieved from INCA 3 study (ANSES, 2021). These diets are implemented in the tool to obtain the distribution of the environmental impact of all three levels. Details on how this was quantified can be found in the Appendix.
The thresholds between the different colour are represented in the Table 4. Environmental indicators colour bar thresholds The values for each indicator can be found in the Appendix (Table 5. The threshold values of the environmental colour bar.).

Table 4. Environmental indicators colour bar thresholds

Colour	Percentile	Interpretation
Dark red	> 87.5th	Very high impact *(More than 87.5% of the French people)*
Light red	75th - 87.5th	High impact
Orange	Median - 75th	Significant impact *(More than half of the French people)*
Yellow	25th - median	Moderate impact *(Less than half of the French people)*
Light green	12.5th - 25th	Low impact

Dark green	< 12.5th	Very low impact *(Less than 87.5% of French people)*

The progress percentage (0%-100%) of the indicator bar is defined, for each nutrient, based on the following formula:

$$\frac{(Impact\ value_{87.5th} - Impact\ value_{Food\ basket})}{(Impact\ value_{87.5th} - Impact\ value_{12.5th})} \quad \text{(between 0\% and 100\%)}$$

For the environmental index

The **environmental index** aims to assess the environmental impacts of the food basket. It is based on the EF single score, itself based on 16 indicators according to the PEF method.

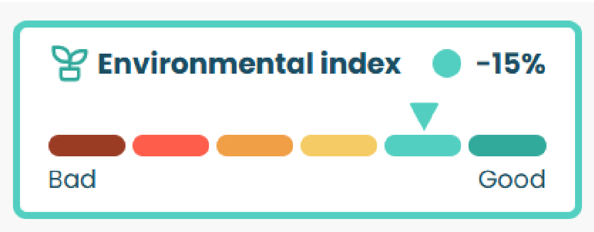

Figure 7. Example of colour bar for the environmental index

The method for obtaining the colour is the same as for the other 16 indicators. Unlike the nutritional section, the percentage displayed is not between 0% and 100%. It expresses the percentage of variation between the median single score value and that of the food basket. This percentage is calculated using the following formula:

$$\frac{(Impact\ value_{Food\ basket} - Impact\ value_{median})}{Impact\ value_{median}} \quad \text{(between } -\infty\% \text{ and } +\infty\%\text{)}$$

This score translates the food basket's overall environmental impact into a simple numerical value. Access to the breakdown by indicator remains possible. Here again, colour bars and visual thresholds make it easier for non-experts to understand.

4. How to use the Webtool?

This section guides you step by step in using Foodbasket7. From setting up your profile to building your weekly food basket and interpreting the results, you'll find clear explanations and screenshots to help you make the most of the tool.

4.1 Login and account creation

Upon first use, the user is invited to create an account using an email address and password. This step is required to enable the storage and management of personal data (food baskets, user profile, preferences) and to allow future access.

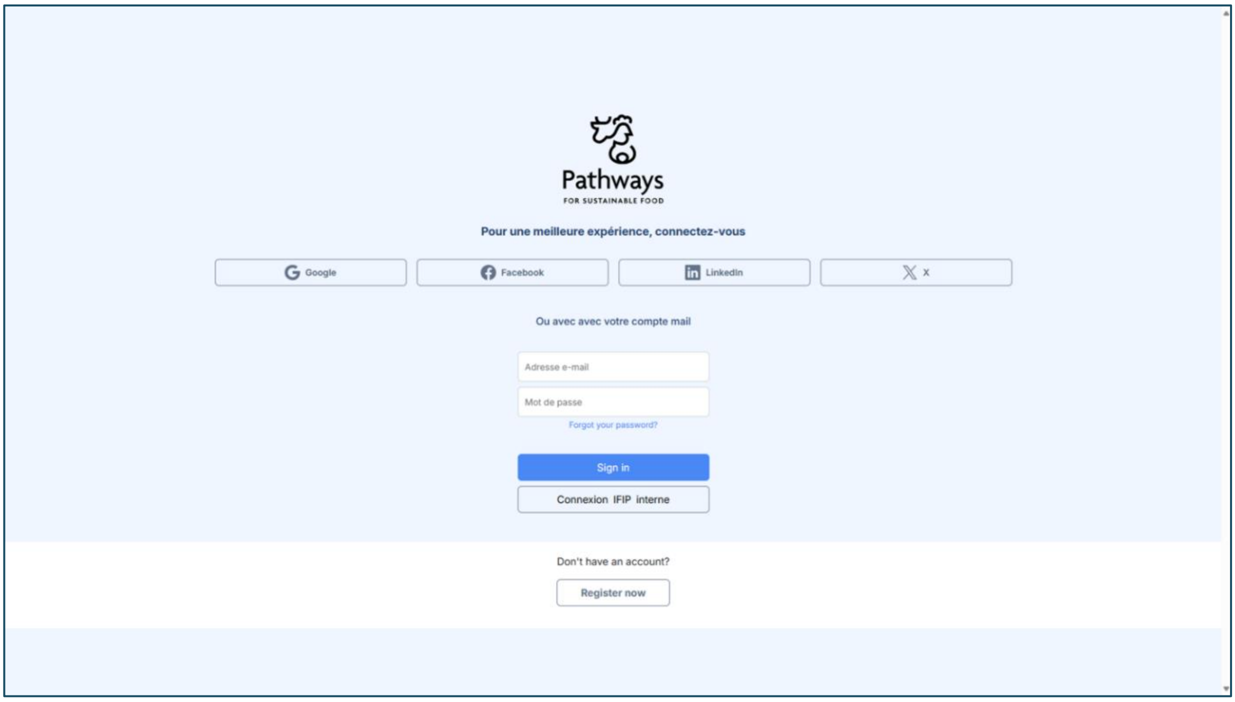

Figure 8. Screenshot — Login and account creation interface

4.2 User profile definition

At first login, the user is guided to define a personalized nutritional profile. The tool prompts for basic personal information, including age, sex, and physical activity level **(a)**. This information allows the tool to calculate Dietary Reference Values (DRVs) specific to the user's profile, which will be used as the basis for evaluating the nutritional adequacy of their food baskets.

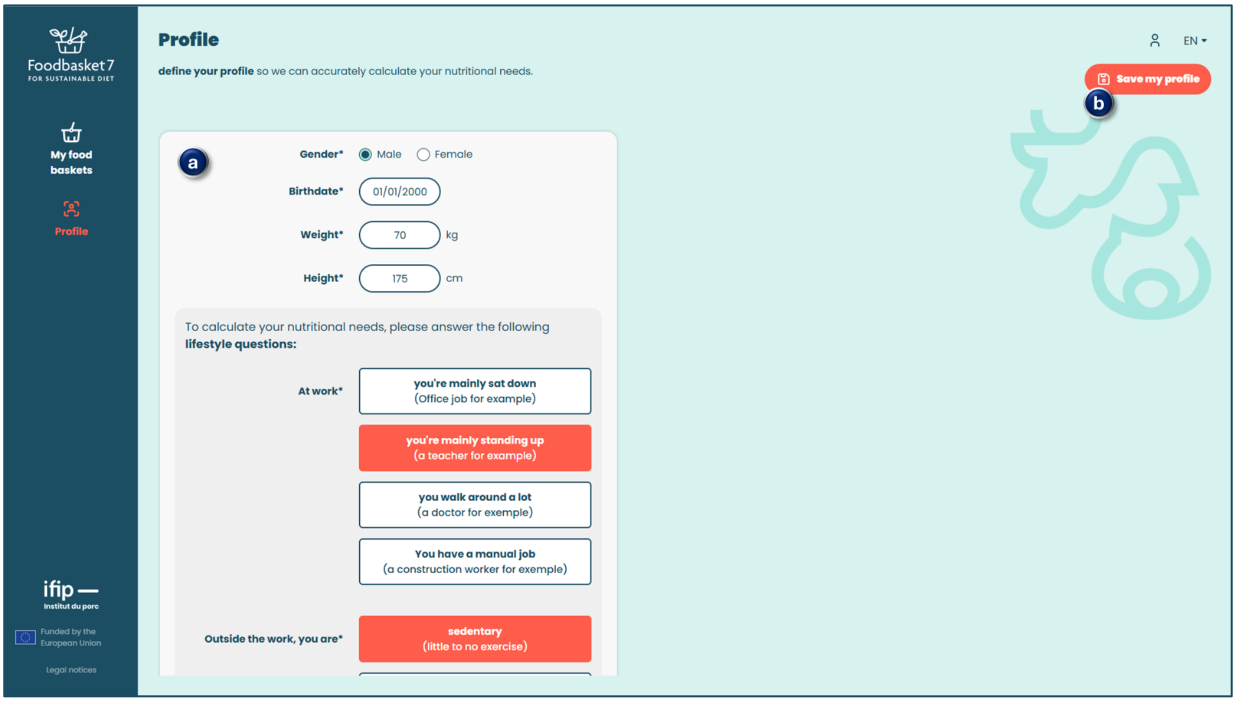

Figure 9. Screenshot — Profile creation form

Once the information is entered and saved **(b)**, the user is presented with a summary table displaying estimated daily requirements for a selection of essential nutrients **(c)**. The information can be modified at any time via a button **(d)**.

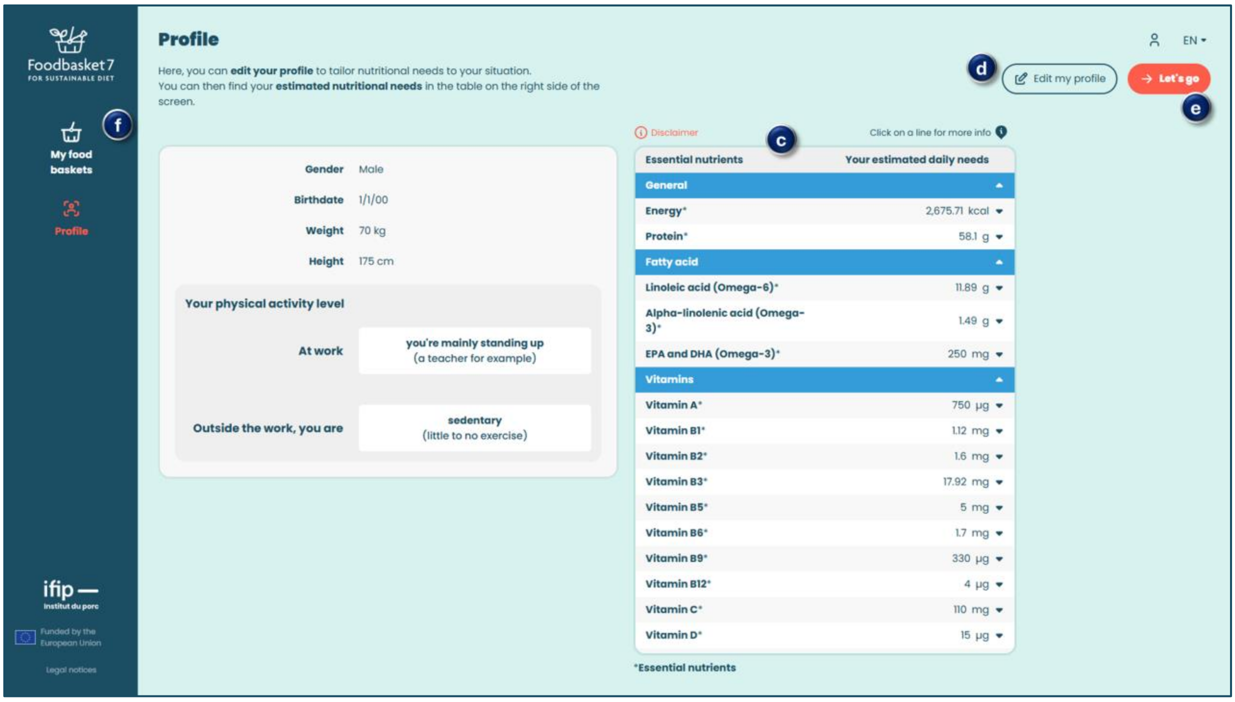

Figure 10. Screenshot — Table of estimated nutritional requirements

To start building a food basket, the user can click the "Let's go" button **(e)** or navigate directly to the "My Food Baskets" section from the sidebar menu **(f)**.

4.3 Building a food basket

Once the profile has been completed, the user gains access to the basket creation interface via the "My Food Baskets" section. By clicking on the "+" button, a new food basket is initiated.
Several parameters can then be customized:

- Rename the food basket **(g)**;
- Choose the duration (between 1 and 7 days) by adding or removing days **(h)**;
- For each day, four meals are proposed: breakfast, lunch, snack, and dinner **(i)**.

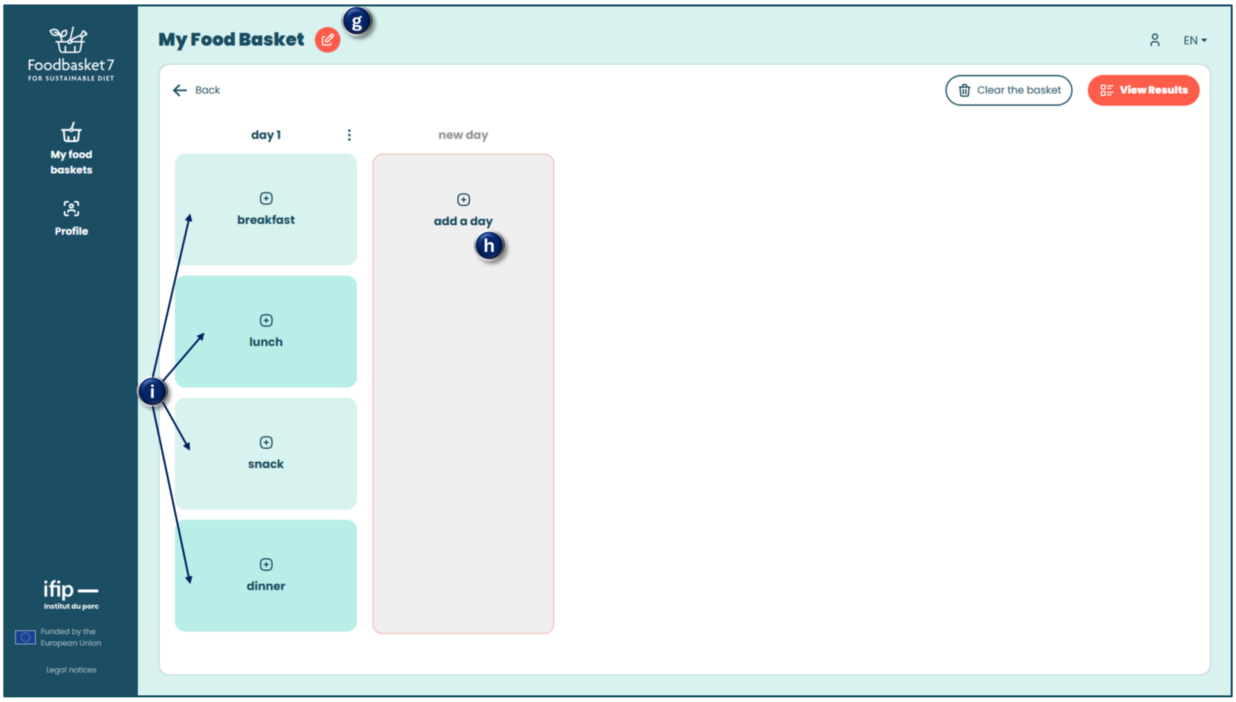

Figure 11. Screenshot — Creation of the Food Baskets interface

For each meal, the user can add foods by opening a dedicated selection window. This feature allows the user to build a custom basket according to their habits, preferences, or dietary goals.

4.4 Food selection and customization

The food selection window is divided into three main areas:

- a top section for search and filters **(j)**;
- a left-hand column displaying the list of available food items **(k)**;
- a right-hand column showing the food items selected for the current meal **(l)**.

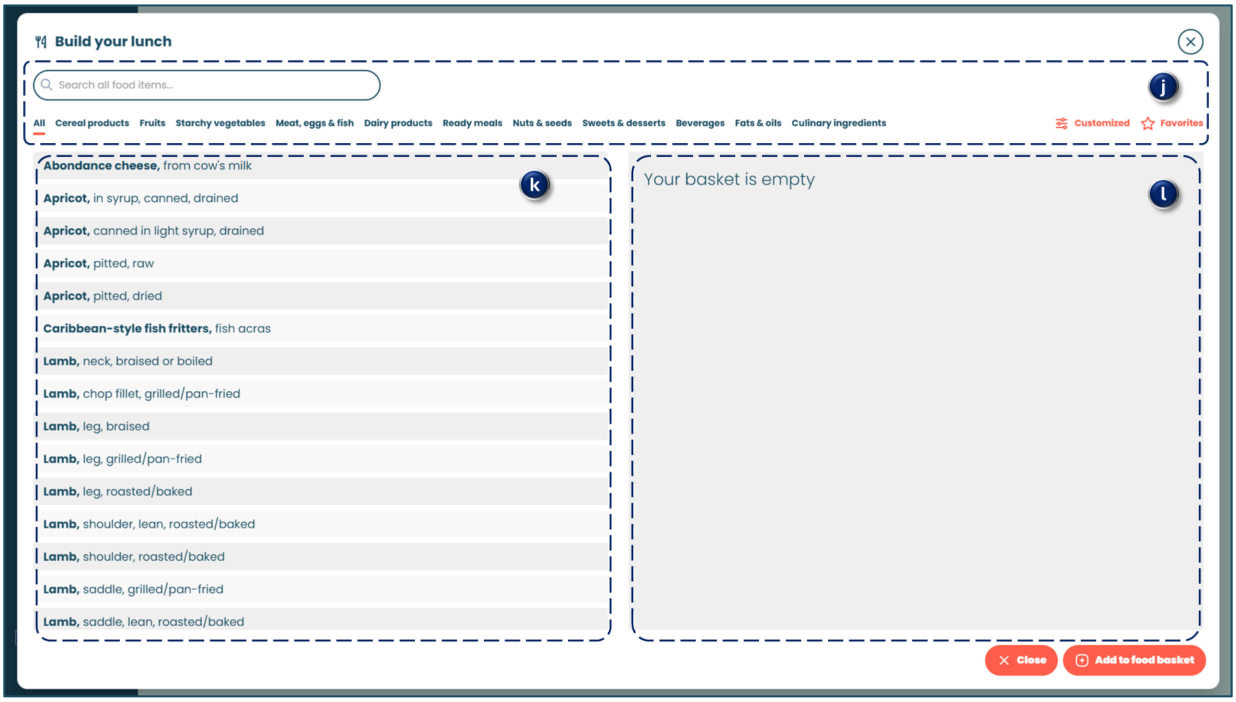

Figure 12. Screenshot — Food items selection window

Users can filter foods by category, perform text-based searches, and access favorite items. To add a food item, the user clicks on its name in the table. Once the food item added, we can :

- adjust the portion size **(m)**;
- consult the nutritional and environmental data **(n)**;
- add the food to favorites **(o)**;
- remove food from the meal **(o)**;
- or customise the food item **(p)**.

The customisation option ("Customised Ingredient") allows for full manual editing of some nutritional characteristics of a food item. Custom products are identified with a specific icon and stored under the "Customs" category. Please note that these entries are not automatically verified, meaning that manual errors could compromise the accuracy of the nutritional evaluation.

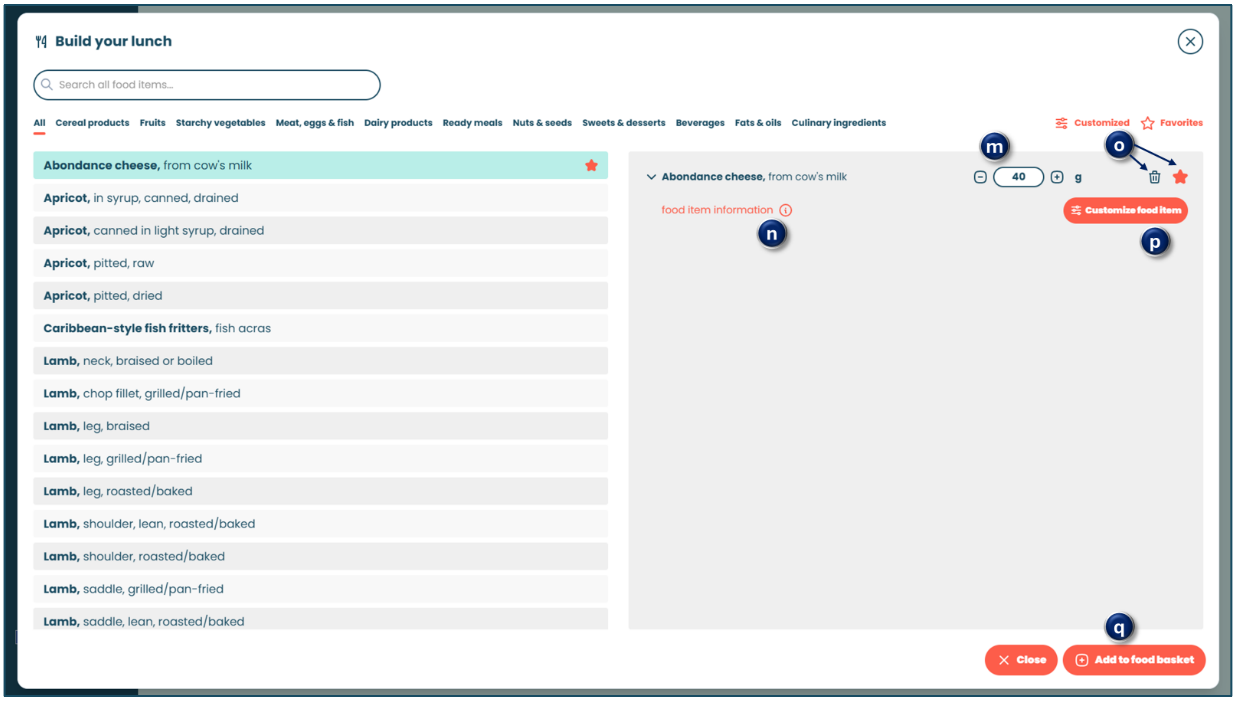

Figure 13. Screenshot — Food items modification window

Once all desired food items have been added and adjusted, the meal can be validated by clicking the corresponding button **(q)**.

4.5 Food Basket Results

Once the basket is complete, the user is taken to an evaluation interface. This interface provides both a nutritional and environmental assessment of the food basket.

Basket Summary

On the right-hand side of the screen, a summary table lists all the selected foods **(r)**, grouped by category and sorted in decreasing order of energy contribution. Clicking on any item provides access to its nutritional and environmental information.
Two pie charts are also displayed, showing the distribution of caloric intake and greenhouse gas emissions by food group **(w)**.

Nutritional Results

Nutritional analysis is based on three levels of information:

- A synthetic nutritional index **(s)**;
- Four categories of nutrients **(t)**;
- Detailed data on 28 specific nutrients **(u)**.

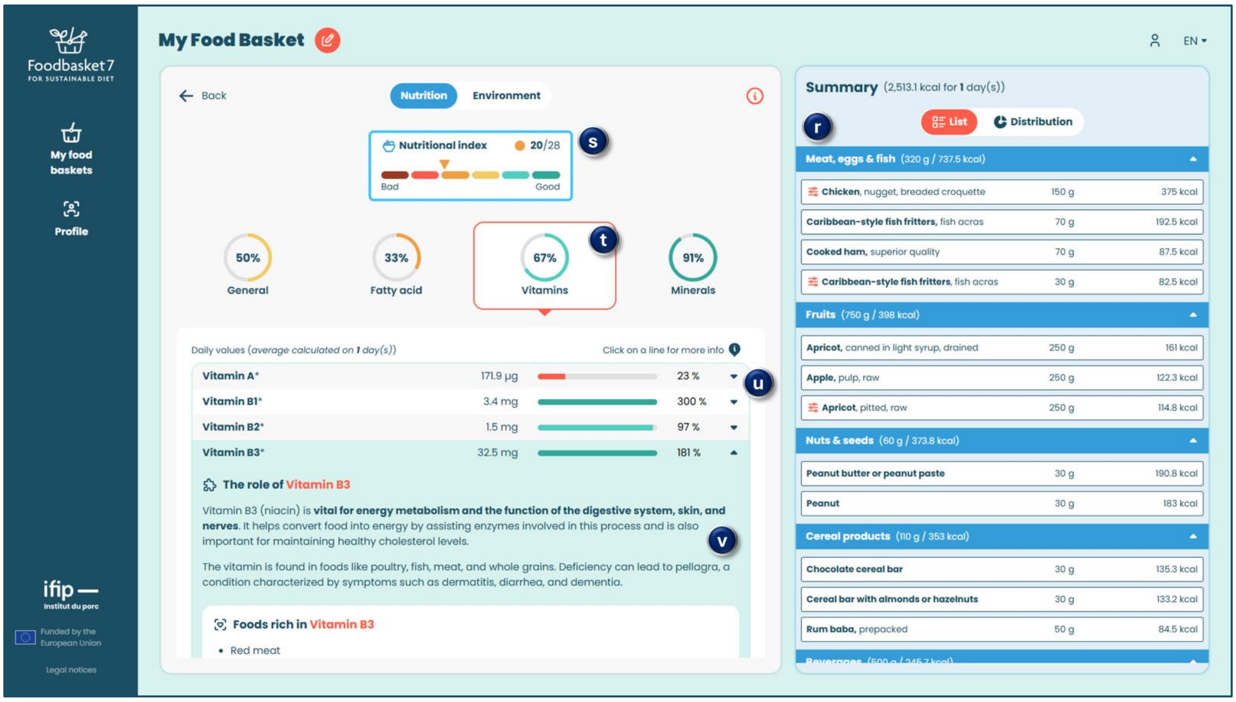

Figure 14. Screenshot — Nutritional results

The synthetic nutritional score is calculated based on the 28 essential nutrients monitored by the tool. This score reflects the overall adequacy of the basket with the user's needs.
The detailed section is divided into four categories: general nutrients, fatty acids, vitamins, and minerals **(t)**. Each category includes a table listing the corresponding nutrients **(u)**. Essential nutrients are highlighted using bold text, an asterisk, and a colour-coded bar that visually compares the intake with the reference needs defined in the user profile. Clicking on a nutrient opens an informative fact sheet explaining its role in human health **(v)**.

Environmental Results

Environmental analysis is also structured across three levels:

- A synthetic environmental score **(x)**;
- Three environmental impact categories **(y)**;
- Detailed values for 16 environmental indicators **(z)**.

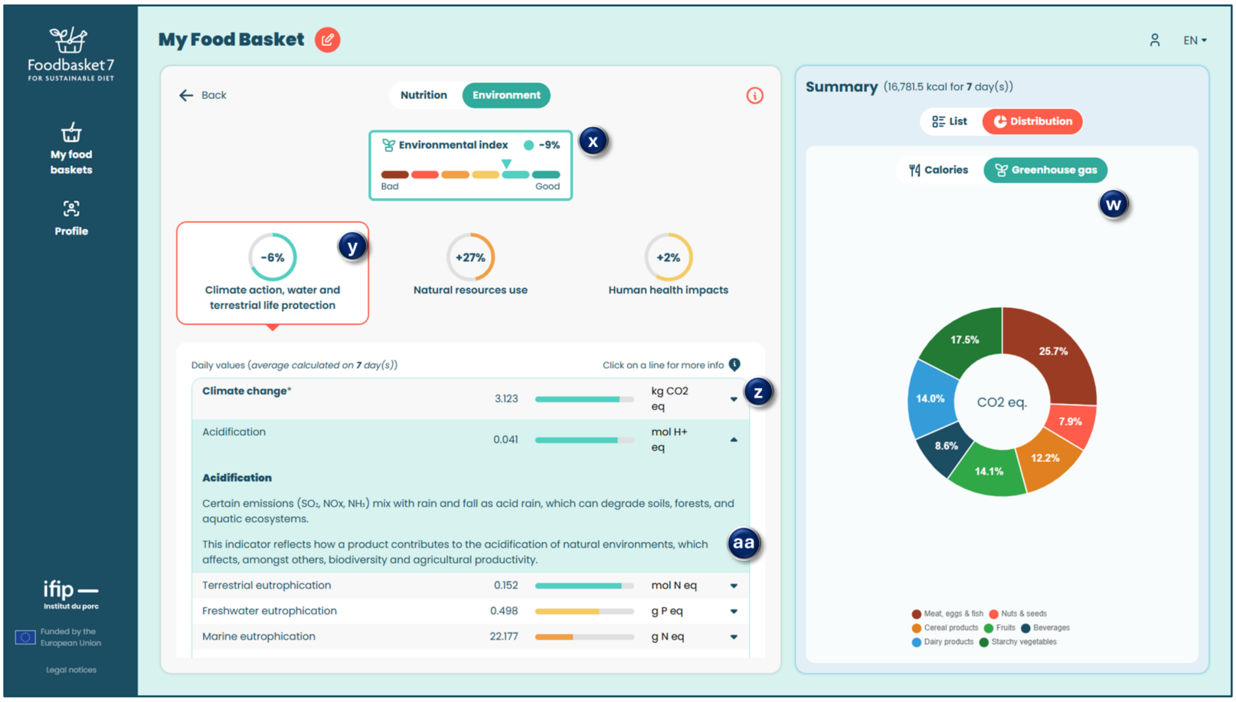

Figure 15. Screenshot — Environmental results

The synthetic environmental score is based on the PEF (Product Environmental Footprint) single score, which is a weighted average of the impacts across 16 environmental indicators.

These indicators are grouped into three main thematic areas: "Climate action, water and terrestrial life protection," "Natural resources," and "Human health impacts" **(y)**. Each indicator is displayed with its measured value, unit, and a colour bar indicating the intensity of its environmental impact **(z)**. Each impact indicator includes an educational text describing its potential effects on environment (**aa)**.

4.6 Dashboard

The "My Food Baskets" section serves as the user's dashboard to manage all previously saved baskets. Each basket is displayed with its name, duration (in days), and the two synthetic indices (nutritional and environmental) **(ab)**. Users can search, edit, duplicate, delete, or create new baskets from this interface.

This dashboard offers a simple and visual comparison tool, allowing users to evaluate their dietary choices or test various food scenarios aligned with their nutritional and sustainability objectives.

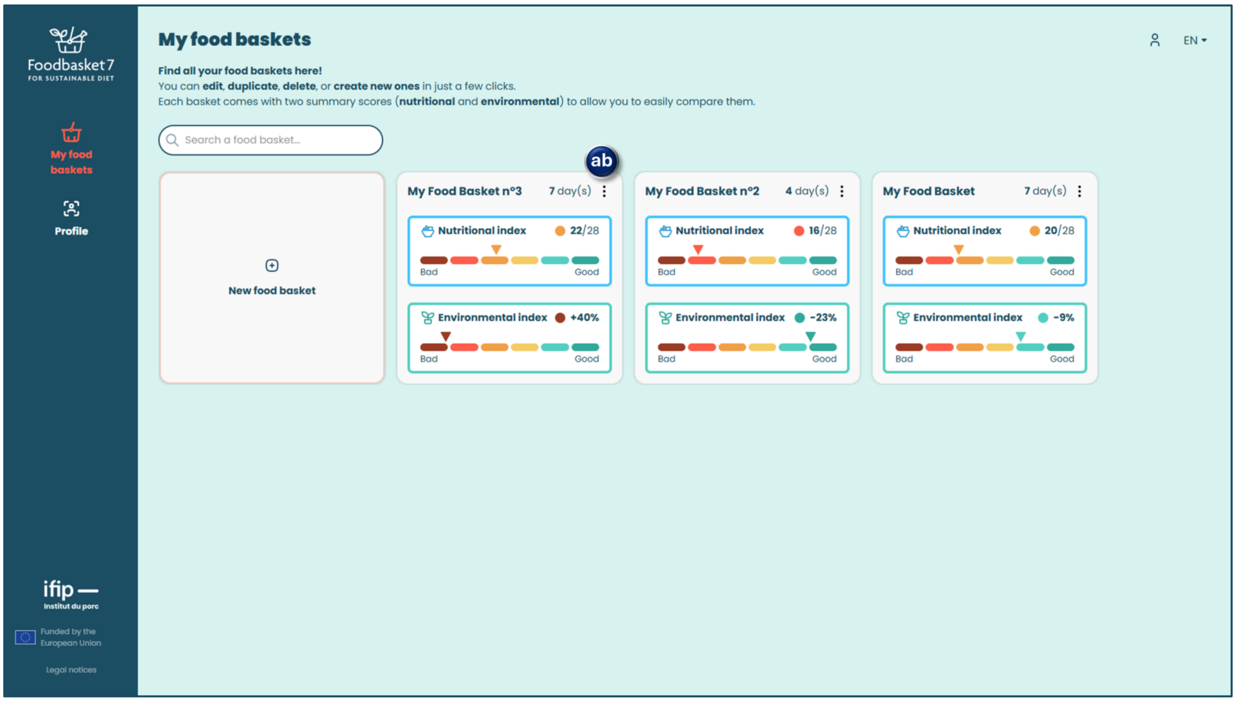

Figure 16. Screenshot — Dashboard overview

5. Conclusion

The PATHWAYS project contributes to bridging the gap between sustainable nutrition and everyday food choices by developing nutrient-rich food baskets adapted to various dietary scenarios. By jointly addressing nutritional adequacy and environmental impact, the project highlights the trade-offs and synergies inherent in our eating habits. The integration of CIQUAL and AGRIBALYSE databases allows for a comprehensive and realistic assessment of food systems. Despite some methodological and data-related limitations, PATHWAYS aims to deliver evidence-based insights to support informed decisions for individuals, public health actors, and policy makers.

To explore the tool developed as part of this initiative, visit: foodbasket7.ifip.asso.fr

6. Terminology

Harmonised Nutrient Reference Values: Nutrient reference values, including Recommended Dietary Allowances (RDAs), Adequate Intakes (AIs), and Tolerable Upper Intake Levels (ULs), guide individuals and health professionals in ensuring that diets provide enough essential nutrients to support health and prevent nutrient deficiencies or excesses. However, these values can vary between countries and regions due to differences in methodologies, population characteristics, or cultural practices. Therefore, harmonising these values would create a set of globally accepted benchmarks, facilitating international collaboration in nutrition research, policy-making, and dietary assessment. To this effect, the PATHWAYS project will adopt a harmonised approach that can be applied on a global scale to assess intakes across populations. The approach incorporates the framework and terminology recommended by reports from the United Nations University, the National Academies of Sciences, Engineering, and Medicine (NASEM), the Institute of Medicine (IOM), and the European Food Safety Authority (EFSA) (4).

Nutritional database (CIQUAL): CIQUAL (Centre d'Information sur la Qualité des Aliments) is a French food composition database that provides detailed nutritional information for a wide range of foods. It includes data on macronutrients (like carbohydrates, proteins, and fats), micronutrients (like vitamins and minerals), and other nutritional factors (like fiber and cholesterol). CIQUAL allows for precise calculation of nutrient intake from different foods and meals (ANSES, 2016).

Environmental database (AGRIBALYSE): This is a comprehensive database that provides Life Cycle Assessments (LCAs) for a wide range of foods produced in France. By using AGRIBALYSE, one can evaluate the environmental impact of different dietary patterns and food choices, which is increasingly important as we strive to make our food system more sustainable (AGRIBALYSE, 2024).

7. Appendices

ENVIRONMENT SCORING SYSTEM

The colour code that is attributed to the diet is based on the environmental impact of French diets of adults retrieved from the INCA 3 study (ANSES, 2021). These diets are implemented in the tool to obtain the distribution of the environmental impact of all three levels (see Table 5). Which food products within the INCA 3 study were linked to which ones in the tool, are presented in Table 6. Some INCA 3 food groups of meat products were linked to a weighted average of several CIQUAL/AGRIBALYSE food groups since there is a large variation in their environmental impact (Table 7).

Table 5. The threshold values of the environmental colour bar.

Category	Unit	Percentile				
		87.5th	75th	50th	25th	12.5th
Climate change	kg CO2 eq	6.09E+00	5.24E+00	4.12E+00	3.24E+00	2.71E+00
Ozone depletion	mg CFC11 eq	8.38E-01	6.09E-01	3.56E-01	1.90E-01	1.24E-01
Ionising radiation	kBq U-235 eq	1.11E+00	9.64E-01	7.85E-01	6.41E-01	5.44E-01
Photochemical ozone formation	g NMVOC eq	3.27E+01	2.41E+01	1.50E+01	1.05E+01	8.55E+00
Particulate matter	disease inc. by one million	6.64E-01	5.53E-01	4.33E-01	3.25E-01	2.64E-01
Human toxicity, non-cancer	nano CTUh	1.51E+02	1.26E+02	9.57E+01	7.36E+01	6.19E+01
Human toxicity, cancer	nano CTUh	4.59E+00	3.99E+00	3.21E+00	2.54E+00	2.13E+00
Acidification	mol H+ eq	8.65E-02	7.15E-02	5.56E-02	4.14E-02	3.30E-02
Eutrophication, freshwater	g P eq	7.41E-01	6.32E-01	5.06E-01	4.13E-01	3.56E-01
Eutrophication, marine	g N eq	2.73E+01	2.36E+01	1.89E+01	1.48E+01	1.22E+01
Eutrophication, terrestrial	mol N eq	3.37E-01	2.82E-01	2.18E-01	1.65E-01	1.32E-01
Ecotoxicity, freshwater	CTUe	9.04E+01	7.87E+01	6.31E+01	5.10E+01	4.26E+01
Land use	Pt	3.15E+02	2.59E+02	1.97E+02	1.50E+02	1.24E+02
Water use	m3 depriv.	3.91E+00	2.85E+00	2.13E+00	1.64E+00	1.35E+00
Resource use, fossils	MJ	6.30E+01	5.45E+01	4.41E+01	3.55E+01	3.05E+01
Resource use, minerals and metals	mg Sb eq	3.49E+01	2.91E+01	2.14E+01	1.61E+01	1.32E+01
Climate action, water and terrestrial life protection	mPt	4.76E-01	4.09E-01	3.22E-01	2.51E-01	2.09E-01
Human health impacts	mPt	1.72E-01	1.44E-01	1.13E-01	8.66E-02	7.13E-02
Resource use	mPt	1.19E-01	1.04E-01	8.26E-02	6.62E-02	5.62E-02
Single score	mPt	7.62E-01	6.55E-01	5.19E-01	4.11E-01	3.41E-01
Threshold between		**Dark red-red**	**Red-orange**	**Orange-yellow**	**Yellow-green**	**Green-dark green**

Table 6. Link between the INCA 3 food groups and their opponent in CIQUAL/AGRIBALYSE. *These INCA 3 food groups were linked to a weighted average of several CIQUAL/AGRIBALYSE food groups since there is a large variation in the environmental impact of meat products.

INCA 3 food group		CIQUAL/AGRIBALYSE food groups
Variable	**Description**	
conso_gpe1	Consumption (g/d) of refined bread and dried bread products	Bread, French bread (baguette or ball), with yeast
conso_gpe2	Consumption (g/d) of whole-grain or semi-whole-grain bread and dried bread products	Bread, French bread, (baguette or ball), multigrain, from bakery
conso_gpe3	Consumption (g/d) of breakfast cereals and cereal bars	Breakfast cereals, rich in fibre, with chocolate, fortified with vitamins and chemical elements
conso_gpe4	Consumption (g/d) of refined pasta, rice, wheat and other cereals*	Dried pasta, cooked, unsalted
conso_gpe5	Consumption (g/d) of whole-grain/semi-whole-grain pasta, rice, wheat and other cereals*	Dried pasta, wholemeal, cooked, unsalted
conso_gpe6	Consumption (g/d) of croissant-like pastries, pastries, cakes and sweet biscuits	Croissant
conso_gpe7	Consumption (g/d) of milk	Milk, semi-skimmed, UHT
conso_gpe8	Consumption (g/d) of yoghurt and fromage blanc	Fermented milk or dairy specialty, yogurt type, plain, with bifidus
conso_gpe9	Consumption (g/d) of cheese	Emmental cheese, from cow's milk
conso_gpe10	Consumption (g/d) of dairy-based and cream desserts	Custard dessert, vanilla, refrigerated
conso_gpe11	Consumption (g/d) of ice cream, frozen desserts and sorbet	Ice cream, in box
conso_gpe12	Consumption (g/d) of animal fats	Butter, 82% fat, unsalted
conso_gpe13	Consumption (g/d) of vegetable fats	Olive oil, extra virgin
conso_gpe14	Consumption (g/d) of eggs and egg dishes	Egg, fried without added fat
conso_gpe15	Consumption (g/d) of meat (excl. poultry)	Beef, steak or beef steak, grilled; and Pork, loin, roasted/baked*
conso_gpe16	Consumption (g/d) of poultry	Chicken, breast, without skin, cooked
conso_gpe17	Consumption (g/d) of delicatessen meats	Merguez sausage, pure beef, raw; Cooked sausage, pure pork; and Poultry sausage
conso_gpe18	Consumption (g/d) of fish	Cod, steamed
conso_gpe19	Consumption (g/d) of crustaceans and molluscs	Shrimp or prawn, cooked
conso_gpe20	Consumption (g/d) of offal	Liver, pork, cooked
conso_gpe21	Consumption (g/d) of vegetables	Tomato, raw
conso_gpe22	Consumption (g/d) of pulses	Red kidney bean, cooked
conso_gpe23	Consumption (g/d) of potatoes and other tubers	Potato, boiled/cooked in water
conso_gpe24	Consumption (g/d) of fresh and dried fruit	Apple, pulp, raw
conso_gpe25	Consumption (g/d) of fruit purées and fruits in syrup	Fruits puree, without sugar added
conso_gpe26	Consumption (g/d) of seeds and nuts	Almond, (with peel)
conso_gpe27	Consumption (g/d) of confectionery and chocolate	Jelly candy
conso_gpe28	Consumption (g/d) of sugar and sweeteners	Sugar, white
conso_gpe29	Consumption (g/d) of bottled water	Water, bottled
conso_gpe30	Consumption (g/d) of tap water	Tap water

conso_gpe31	Consumption (g/d) of cold non-alcoholic beverages (CNABs)	Lemonade, with sugar
conso_gpe32	Consumption (g/d) of fruit and vegetable juice	Orange juice, reconstituted from a concentrate
conso_gpe33	Consumption (g/d) of alcoholic beverages	Wine, red
conso_gpe34	Consumption (g/d) of hot beverages	Espresso coffee, not instant coffee, without sugar, ready-to-drink
conso_gpe35	Consumption (g/d) of soups and broths	Soup, tomatoes, prepacked, to be reheated
conso_gpe36	Consumption (g/d) of meat dishes	Beef, minced steak, 15% fat, raw; Ham in cube, grated or minced; and Poultry, minced meat*
conso_gpe37	Consumption (g/d) of fish dishes	Caribbean-style fish fritters, fish acras
conso_gpe38	Consumption (g/d) of vegetables dishes	Vegetable fritters
conso_gpe39	Consumption (g/d) of potato, cereal or pulse dishes	Rice, cooked, unsalted
conso_gpe40	Consumption (g/d) of sandwiches, pizzas, pies, savoury pastries and biscuits	Salty snacks, crackers, plain
conso_gpe41	Consumption (g/d) of condiments, herbs, spices and sauces	Mustard
conso_gpe42	Consumption (g/d) of substitutes for animal products made from soya/other plants	Almond drink not sweet, not fortified, prepacked
conso_gpe43	Consumption (g/d) of prepared dishes and desserts for infants	Vegetable dish for baby, w meat/fish and starch, from 12 months
conso_gpe44	Consumption (g/d) of infant milks and drinks	Baby milk, first milk, ready to feed

Table 7. Overview of INCA 3 food groups linked to a weighted average of several CIQUAL/AGRIBALYSE food groups and their share.

INCA 3 food group description	**CIQUAL/AGRIBALYSE food groups**	**Share within each food group (-)**
Consumption (g/d) of meat (excl. poultry)	Beef, steak or beef steak, grilled	0.42
	Pork, loin, roasted/baked	0.58
Consumption (g/d) of delicatessen meats	Merguez sausage, pure beef, raw	0.26
	Cooked sausage, pure pork	0.36
	Poultry sausage	0.38
Consumption (g/d) of meat dishes	Beef, minced steak, 15% fat, raw	0.26
	Ham in cube, grated or minced	0.36
	Poultry, minced meat	0.38

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