



Percent of energy comprised of ultra-processed foods

Overview

The percent of energy from ultra-processed foods in the diet is an indicator that provides an understanding of changing dietary patterns, cultural preference, and diet quality. Low- and middle-income countries are rapidly undergoing a nutrition transition that is characterized by changes in dietary patterns and nutrient intakes, resulting in higher consumption of energy dense and processed foods ([Popkin, 2002](#) [1]). Ultra-processed foods are foods that undergo industrial processes (e.g. salting, sugaring, frying, and curing) that extend shelf life, make food extremely palatable, and make food that is designed to be ready-to-consume ([Vandevijvere et al., 2013](#) [2]). Diets rich in ultra-processed foods may promote obesity and chronic disease because these foods typically have a high glycemic load and are energy dense; low in fiber, micronutrients, and phytochemicals; and high in unhealthy fats and sugars, in addition to being highly palatable ([Ludwig, 2011](#) [3]).

Method of Construction

Data used to construct this indicator should come from food consumption surveys of individuals, such as quantitative [24-hour Dietary Recalls](#) [4], [Weighed Food Records](#), [5] and quantitative [Food Frequency Questionnaires](#) [6] (FFQs) designed specifically for this purpose. See the table below for a more detailed explanation of the classification of unprocessed/minimally processed, processed, and ultra-processed food groups, and refer to [Monteiro et al., 2010](#) [7]. A food composition table is used to estimate the total energy (kcal) intake over the day from all foods and beverages recalled in the survey, including the energy provided by ultra-processed foods. The indicator is then constructed using the formula below:

$$\frac{\text{Total energy from ultra-processed foods consumed (kcal)}}{\text{Total energy from all foods consumed (kcal)}} \times 100$$

Classification groups as proposed by [Monteiro et al., 2010](#) [7]

Group 1:

Unprocessed
and minimally
processed foods

Group 2: Processed culinary
or food industry ingredients

Group 3: Ultra-
processed food products

C Pressure, milling, products. Salting, sugaring,
 p: refining, baking frying, deep frying,
 g: hydrogenation, curing, smoking, pickling,
 fl: hydrolysis, canning, addition of
 st: additives, preservatives and additives,
 bi: enzymes synthetic vitamins and
 di minerals, packaging
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Purpose of processing

Preservation, availability and accessibility of food product, safety, palatability

Extraction of substances from unprocessed or minimally processed foods to produce culinary/food industry ingredients

Create durable, accessible, convenient, palatable, sometimes habit-forming products

Examples

Fresh meat, grains, legumes, nuts, fruits, vegetables, roots, tubers, tea, coffee, herbs, tap water, bottled spring water

Starches, flours, oils and fats, salt, sugar, sweeteners, high fructose corn syrup, lactose, milk and soy proteins

Ready-to-eat snacks and desserts (breads, cereal bars, chips, cakes), ready-to-heat foods (frozen pizza and pasta, sausages, fish sticks, canned soups), infant formulas, baby foods

Uses

This indicator has been proposed by the International Network for Food and Obesity/Non-Communicable Disease Research, Monitoring and Action Support (INFORMAS) as an indicator that can be used globally to monitor changes in population diet quality over time and across countries ([Vandevijvere et al., 2013](#) [2]). This indicator enables an analysis of the relative contribution of ultra-processed foods to overall dietary energy intakes based on data from

individuals, and therefore can be used to assess differences between sub-population groups based on geographic location, income group, and various other demographic characteristics.

Strengths and Weaknesses

This indicator measures the relative contribution of ultra-processed foods to overall dietary energy intakes; it does not provide information on the consumption of individual nutrients or specific foods. Since ultra-processed foods can often be consumed outside of the home, survey data used for this indicator that do not include detailed information about food consumed outside of the home will underestimate the percent of energy from ultra-processed foods. It should also be noted that this indicator has not yet been thoroughly tested ([Vandevijvere et al., 2013](#) [2]).

Data Source

Data from individual quantitative [24-hour Dietary Recalls](#) [4], [Weighed Food Records](#) [5], and [FFQs](#) [6] designed for this purpose can be used to construct this indicator. This indicator could also be constructed at the household level using [Household Consumption and Expenditure Surveys](#) [8] (HCES) that have an appropriate level of disaggregation of foods and include detailed information on foods consumed away from home ([Smith et al., 2014](#) [9]).

The Food and Agriculture Organization/World Health Organization's Global Individual Food consumption data Tool ([FAO/WHO GIFT](#) [10]) is a source for individual-level quantitative dietary data. FAO/WHO GIFT aims to make publicly available existing quantitative individual food consumption data from countries all over the world. National or regional Food Composition Tables should be used to identify the energy content of the foods and can be found at FAO's International Network of Food Data Systems ([INFOODS](#) [11]) or the International Life Science Institute's (ILSI) World Nutrient Databases for Dietary Studies ([WNDDS](#) [12]).

Links to guidelines

- [Vandevijvere et al., \(2013\). "Monitoring and benchmarking population diet quality: a step-wise approach"](#) [2]
- [Monteiro et al., \(2010\). "A new classification of foods based on the extent and purpose of their processing"](#) [7]

Links to illustrative analyses

- [Monteiro et al., \(2010\). "Increasing consumption of ultra-processed foods and likely impact on human health: evidence from Brazil"](#) [13]
- [Moubarac et al., \(2013\). "Consumption of ultra-processed foods and likely impact on human health. evidence from Canada"](#) [14]
- [Rauber et al., \(2015\). "Consumption of ultra-processed food products and its effects on children's lipid profiles: A longitudinal study"](#) [15]

Food Security Dimensions

- [Quantity](#) [17]
- [Quality](#) [18]

Data Collection Levels

- [Individual](#) [19]

Data Sources and Methods

- [24-Hour Dietary Recall \(24HR\)](#)
- [Food Frequency Questionnaire \(FFQ\)](#)
- [Weighed Food Record \(WFR\)](#)
- [Food Composition Databases](#)

Requires Food Composition Database

- [Yes](#) [20]

Please cite as: INDDEx Project (2018), Data4Diets: Building Blocks for Diet-related Food Security Analysis. Tufts University, Boston, MA. <https://index.nutrition.tufts.edu/data4diets>. Accessed on 10 June 2023.