



Definition of Whole Grain as Food Ingredient

Whole grains shall consist of the intact, ground, cracked, flaked or otherwise processed kernel after the removal of inedible parts such as the hull and husk. All anatomical components, including the endosperm, germ, and bran must be present in the same relative proportions as in the intact kernel.¹

1. This definition applies to cereal grains in the Poaceae family, and pseudo-cereals listed in Annex 1, that are used for human consumption.
2. Processing of cereals and their fractions includes dry and wet methods which should be executed according to good manufacturing principles and considers the following points:
 - 2a. A batch of grain consisting of one or more varieties or classes of a single species may be temporarily separated into fractions and considered whole grain if the fractions are recombined in the original proportions.
 - 2b. Grain fractions from one or more varieties or classes of a single species that originated from different batches and combined to reflect the original proportions are considered whole grain.
 - 2c. Small, generally unavoidable losses of components, that occur through processing consistent with safety and quality standards are allowed.
 - 2d. Fermented, malted or sprouted grains containing all of the original bran, germ and endosperm shall be considered whole grains as long as nutrient values have not diminished; for malted or sprouted grains the length of the sprout should not exceed kernel length.

¹ The use of the term wholemeal may be legally protected in some jurisdictions and may be equivalent to whole grain. The use of this term should be checked within local contexts.

ANNEX 1.

Pseudo-cereals used for human consumption considered as grains

Species	
	Amaranth
	Buckwheat, Tartary buckwheat
	Quinoa

The anatomical components of pseudo-cereals, being dicotyledons, are different from those of the monocotyledonous cereal grains. As for cereal grains, all edible anatomical parts of processed pseudo-cereals must be present in the same relative proportions as in the intact seed.

APPENDIX TO THE DEFINITION OF WHOLE GRAIN AS FOOD INGREDIENT

This definition refers to whole grain as a raw material and a food ingredient. The definition is generic and does not include quantitative criteria relevant for a single grain. Such criteria are available in existing standards and specifications. The term kernel is used for many widely consumed grains, such as wheat, maize, rice, barley and rye. Other commonly used terms include seed, berry, groats and grain. Additional terms, both in English and other languages may be used as well. The anatomical components referred to in the definition are:

- The bran fraction including the pericarp (outer and inner pericarp), the seed coat and the aleurone layer of the cereal grain.
- The germ fraction.
- The endosperm fraction including starchy endosperm.

Ad 1. The Poaceae (also called Gramineae) family includes all kinds of edible and other grasses. A wide range of edible ones, called cereal grains, is listed in definitions (e.g. AACCI and Healthgrain) and by the Whole Grains Council (see <https://wholegrainscouncil.org/whole-grains-101/whole-grains-z>) together with the pseudo-cereals listed in Annex 1. The global definition allows addition of newly developed species of cereal grains, such as Tritordeum, when they are accepted by the relevant authoritative body as grain for human consumption.

Following existing definitions and dietary guidelines of whole grain worldwide, pulses and legumes are not included.

Ad 2. Most grains need to be processed before consumption, which may include cleaning (removal of stones, stems, etc.), removing inedible parts (e.g., hull/husk), dry (e.g., milling) and wet (e.g., malting, sprouting, fermenting) processing to make nutrients more available and improve palatability, and stabilizing (e.g., toasting germ and rice bran) to inactivate enzymes that reduce storage stability. Therefore, in addition to the “ground, cracked, flaked” mentioned in the AACCI and Healthgrain definition, “otherwise processed” is included. Issues related to further processing such as baking and extrusion for preparing food products are outside the scope of the definition of whole grain as a food ingredient.

Ad 2b. In most commonly applied milling processes endosperm, bran and germ are separated for later recombination. For most whole grains and flours that require a long shelf life, the germ and bran fraction are heat stabilized, followed by recombination with the endosperm of a batch of grain that entered the plant later. In many large flour milling plants, a wide range of varieties of the same grain are processed.

Ad 2c. Consistent with good standards of manufacturing practices, small, generally unavoidable losses resulting from removal of the hull/husk, milling, or processing (e.g., minimally processed bulgur and nixtamalized maize), as well as minimal removal of outer layers are acceptable. Allowable limits for the percentage removed should be evidence-based, be kept to a minimum, may depend on the specific grain type or variety, and on local regulations or constraints (e.g., in some jurisdictions 2% is the maximum loss allowed for wheat).

Ad 2d The Global Working Group acknowledged that current practices in grain processing include methods such as sprouting and fermentation and agreed with the text of item 2d – the AACCI statement for malted and sprouted grains (2008), with addition of ‘fermented’, since processing increasingly includes fermentation of grains, flours, or a fraction (e.g. bran, where bakeries apply long partial pre-fermentations before reconstitution to a whole grain dough for ‘standard’ fermentation).

The Global Working Group also agreed with the recommendation by the Healthgrain Forum (2017) that processing should not result in a >10% reduction in the dietary fibre content (as an indicator of the amount of beneficial components within the whole grain).



Status of the Definition

This global definition of Whole Grain as Food Ingredient was developed in 2018-'19 by the Definitions Working Group of the global Whole Grain Initiative (WGI), with experts from academia, government agencies and industry. In developing the definition, the Group took into account widely accepted definitions and new developments. In March 2021, an explanatory sentence was added to the Annex of the definition: The anatomical components of pseudo-cereals, being dicotyledons, are different from those of the monocotyledonous cereal grains. As for cereal grains, all edible anatomical parts of processed pseudo [Annex 1] cereals must be present in the same relative proportions as in the intact seed.

The definition has been ratified by the leading international scientific associations - the Cereals & Grains Association, the Healthgrain Forum and the International Association for Cereal Science and Technology (ICC) - and has been published in the journal *Nutrients* (December 29, 2021, <https://www.mdpi.com/2072-6643/14/1/138>).

The Whole Grain Initiative leadership team is seeking adoption by key authoritative bodies.

A specific whole grain ingredient definition, chosen by a national or other jurisdiction or regulatory body should meet the requirements of the global definition, as is the case with the Codex Definition of dietary fibre and other global definitions; however, the definition for certain regions or jurisdictions may have additional stipulations.