Whole grain definition

Introduction

The term 'grain' applies to the genera and species of the grass family (*Poaceae*) and includes the pseudocereals and other cereal grains, as set out in Table 1. Pulses, nuts and seeds are not included. All the grains of the *Poaceae* family are related both structurally and biochemically. Typical grains are energy dense and can vary in starch content (typically 50–80%), depending on the species, origin and environmental growing conditions. Cereal grains are those that are typically included in the bread and cereal groups in dietary guidance in most countries.

This whole grain definition is expected to be useful in the context of nutrition recommendations and guidelines and nutrition claims. Health claims, on the other hand, must be based on documentation of specific effects of grains or grain components in the diet.

Table 1. Whole grain sources

Cereal	Scientific name
Cereals	
Wheats, including spelt, emmer, faro, einkorn, kamut, durums	*Triticum* spp.
Rice	*Oryza* spp.
Barley including hull-less or naked barley but not pearled	*Hordeum* spp.
Maize (corn)	*Zea mays*
Rye	*Secale* spp.
Oats, including hull-less or naked oats	*Avena* spp.
Millets	*Brachiaria* spp.; *Pennisetum* spp.; *Panicum* spp.; *Setaria* spp.; *Paspalum* spp.; *Eleusine* spp.; *Echinochloa* spp.
Sorghum	*Sorghum* spp.
Teff (tef)	*Eragrostis* spp.
Triticale	*Triticale*
Canary seed	*Phalaris arundinacea* and *P.canariensis*
Job's tears	*Coix lacryma-jobi*
Fonio, black fonio, Asian millet	*Digitaria* spp.
Wild rice	*Zizania aquatica*
Pseudocereals	
Amaranth	*Amaranthus caudatus*
Buckwheat, Tartar buckwheat	*Fagopyrum* spp.
Quinoa	*Chenopodium quinoa* Willd. is generally considered to be a single species within the Chenopodioideae

Whole grain definition

- Whole grains shall consist of the intact, ground, cracked or flaked kernel after the removal of inedible parts such as the hull and husk. The principal anatomical components - the starchy endosperm, germ and bran - are present in the same relative proportions as they exist in the intact kernel.
- Small losses of components - i.e. less than 2% of the grain/10% of the bran - that occur through processing methods consistent with safety and quality are allowed.

Milling and processing

- Whole grain foods are almost universally processed to make them edible and safe for human consumption.
- Whole grain includes grains that have been subjected to processing but only if, after processing, the germ, endosperm and bran are present in the same, or virtually the same proportions, as in the original grain.
- Temporary separation of whole grain constituents during processing for later recombination is acceptable, provided the proportions of the germ, endosperm and bran are the same or virtually the same as in the original grain.
- Recombination of bran, germ and endosperm from the same type and variant of grain in which a component (bran, germ or endosperm) has been stabilised is allowed, provided that the three components are in the correct proportions.
- Removal of the very outer bran layer - up to 10% of the bran or 2% of the grain - is acceptable for minimising levels of undesirable substances such as bacteria, moulds, agrochemicals and heavy metals.
- Recombination of the endosperm, bran and germ takes into account that there are variations in the ratio of endosperm, bran and germ between kernels in one ear and between varieties of one type of grain. Recombination per grain and per variety will result in some fluctuations in the ratios of endosperm, bran and germ between batches of flour and products. There should, however, be no significant nutritional losses, and differences should be no greater than normally found from season to season or between varieties.
- Virtually all the cereals are made into flours that can be used to bake breads and other cereal-based products, including breakfast cereals. Production of those flours and products must follow appropriate quality systems (e.g. Good Manufacturing Processes, GMP etc.) in compliance with food safety regulations in the European Union.
- Storage conditions and shelf-life of whole grain flours, breads and cereal-based products vary according to the nature and composition of the product. Shelf-life stability information should be provided on product labels in compliance with European legislation.

References

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Regulation (EC) No. 1924/2006 of the European Parliament and of the Council on nutrition and health claims made on foods.

i. The word *kernel* in this definition stands for *caryopsis*, and is chosen as consumer-friendly wording.

ii. Rice, wild rice and the specified pseudocereals are included in the whole grain sources. Dietary guidelines with regard to a food category do not exclude a particular food within the group because of a particular compositional profile. Pseudocereals have a similar macronutrient composition to cereals, and in dietary guidelines they are included in the bread and cereal group. Pseudocereals provide alternative sources of grains for those who cannot consume mainstream cereals because of allergies and they allow for product innovation and a wider consumer choice. US FDA draft guidance in 2006 also included the specified pseudocereals amaranth, buckwheat and quinoa.

iii. The adding together, after temporary separation, of the three whole grain constituents as separate ingredients, in the correct proportion at both the milling and baking stages, is consistent with longstanding food industry technological and safety practices in Europe and the USA.

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