



DEFINITION OF A WHOLE-GRAIN FOOD - ADDITIONAL INFORMATION AND GUIDANCE

Introduction

The global definition of a Whole-Grain Food was developed by the Definitions Working Group of the global Whole Grain Initiative (WGI), with experts from academia, government agencies and industry. For developing a definition with minimum whole-grain levels of dietary significance for nutrition/health and consumer credibility the group considered widely accepted, existing definitions and regulations as well as new developments in the external environment, including the growing activity of consumer organisations in expressing needs and wishes regarding whole grain-related regulations and labelling.

The definition document 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 will seek adoption by key authoritative bodies. The definition document includes some explanatory notes. This Additional Information and Guidance document serves to provide comprehensive explanations and guidance for applying the definition in practice. This document will be adapted as new developments occur and for each step towards endorsement and approval of the definition.

A generic definition

Considering the wide and increasing variety of whole-grain products around the globe, setting product-specific global whole-grain food definitions is not a realistic option. As a response to the growing need for a generic definition AACC International (now the Cereals & Grains Association) proposed in 2013: *a whole grain food product must contain 8 grams or more of whole grain per 30 grams of product* (1).

Definition based on dry weight

The setting of a minimum percentage of whole-grain ingredients based on the dry weight of the product for defining whole-grain foods was proposed in 2017 by the Healthgrain Forum (2) and by ANVISA, the regulatory body for food and health in Brazil (3). Both organisations proposed a generic definition. In Denmark and Sweden minimum percentages of whole-grain ingredients on a dry-weight basis have been in place for over 20 years for defining whole-grain foods, combined with mentioning the percentage of whole-grain ingredients on the pack based on the Quantitative Ingredient Declaration (QUID) system (4). An example for how to calculate the percentage of whole grain based on dry weight and based on the QUID system as given in Appendix 4 of the Danish Whole Grain Logo User Manual (5) is presented below. For these calculations national food composition databases may be used, including the widely used database of the United States Department of Agriculture <https://fdc.nal.usda.gov/index.html>.



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A Whole-Grain Food – at least 50% whole-grain ingredients based on dry weight

This level was chosen for the following reasons:

- The aim of the definition is to promote an increased intake of whole grains to maximise the health benefits of consumption of whole grains.
- By choosing at least 50% (instead of at least 30%, as proposed by Healthgrain Forum and ANVISA), the sum of whole-grain ingredients will be the majority of the product on a dry-weight basis.
- Ensuring a whole-grain food contains whole-grain ingredients as the primary ingredient on a dry-weight basis minimises consumer confusion.

Minimum level for mentioning whole grain front-of-pack: 25% whole-grain ingredients based on dry weight

Based on the following considerations the level of 25% whole grain based on dry weight was chosen:

- the first 8g/serving recommendation was made in the US where this amount is 1/6 of the 48g/d whole grain dietary intake recommendation. This level, which has been used in most epidemiological studies, was considered as the minimum meaningful amount of whole grain deserving of mention front-of-pack.
- This 8g whole grain/serving is currently widely recommended and used [Malaysia (6), Australia (7) UK Institute of Grocery Distribution (IGD) recommendation (8)].
- When using the relatively small serving sizes as recommended by USDA and the Whole Grains Council (9), 8g whole grain /serving corresponds to ~25 – 30 g whole grain /100g.
- Serving sizes are defined differently in different countries. Therefore, in order to avoid confusion in a global definition, the minimum amount of whole-grain ingredients is expressed as a percentage.

Finally, the combination of at least 50% whole-grain ingredients for whole-grain foods and at least 25% for inclusion of “whole grain” in front-of-pack labelling is in line with regulations and recommendations by Codex and other authoritative bodies. These organisations require two levels of a nutrient in a food (such as “source of” and “high” dietary fibre) where the amount required for the “high” qualification is twice the amount required for “source of”. The dual levels will also address both the need for a high whole-grain level in whole-grain foods as expressed by consumer organisations, and for a lower but meaningful minimum level for inclusion of whole grain in front-of-pack labelling to attract consumers not accustomed to higher levels.

Providing additional information on content of whole-grain front-of-pack

Providing quantitative information about the content of whole grain in any front-of-pack labelling is strongly recommended. Therefore, a range of considerations and examples are presented here.

With the growing sales of whole-grain products around the world, consumer organisations are becoming increasingly active in expressing needs and wishes.



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These include the setting of high, dietarily meaningful minimum levels of whole-grain ingredients for whole-grain foods and for providing clear information front-of-pack, for example about the amount of whole grain in the product and about partial replacement of whole grain by other ingredients such as refined grain (11, 12).

Consumer organisations in some regions state that, when a product is labelled as a “whole-grain product” without further specifications, that consumers expect that all the grain is whole (10).

A number of examples for providing quantitative information provided by regulations and by using whole grain stamps is presented below.

Australia-New Zealand – regulation (13)

Food Standards Australia New Zealand guides the definition of whole grain and Standard 1.2.10 – Characterising Ingredients and Components of Food sets out how whole grain can be described on a food label. Food products must comply with *Clause 3 When is an ingredient or component ‘characterising’?* and *Clause 8 The ingredient or component is emphasised on the label of a food in words, pictures or graphics and therefore declare the proportion (%) of each characterising ingredient and characterising component of the food on the label.*

The European Union – regulation (14)

Regulation (EU) No 1169/2011 on the provision of food information to consumers of the European Union, is providing in Annex VI Article 4 clear guidelines for whole-grain foods products when part of the whole grain has been replaced by another ingredient:

Annex VI Article 4:

4. In the case of foods in which a component or ingredient that consumers expect to be normally used or naturally present has been substituted with a different component or ingredient, the labelling shall bear — in addition to the list of ingredients — a clear indication of the component or the ingredient that has been used for the partial or whole substitution:

(a) in close proximity to the name of the product; and

(b) using a font size which has an x-height of at least 75 % of the x-height of the name of the product and which is not smaller than the minimum font size required in Article 13(2) of this Regulation.

Malaysia – regulation (6)

The new (2020) Malaysian Food Regulation requires that the percentage of whole grain in the product is mentioned front-of-pack next to ‘Wholemeal’ or ‘Whole grain’.

Whole-grain stamps and certification systems- indicating the percentage of whole-grain ingredients in the product and/or the percentage whole-grain ingredients of the total amount of grain ingredients, exist in many countries. Most often these are issued by non-government, industry-based organisations. Some examples:

The Whole Grain Stamps of the Oldways Whole Grains Council are used on over 13,000 products in 62 countries – with a 3-level labelling system (11). The stamps indicate both the percentage and the amount of whole grain. Maintaining the same principles, minor adaptations are being applied per country for being in line with its definition and regulations for of whole-grain foods. The stamps as used in the US are presented below.

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The 100% Stamp: *all* its grain ingredients are whole grain. Minimum requirement: 16 grams – a full serving – of whole grain per labelled serving,


The 50%+ Stamp: at least half of its grain ingredients are whole grain. Minimum requirement of 8g per labelled serving,

Products with the 100% and the 50%+ Stamp are considered to be Whole Grain Foods

The Basic Stamp – products contain at least 8g (a half serving) of whole grain, but may contain more refined grain than whole grain. Products with the Basic Stamp are not considered to be “whole-grain foods”.



The Whole-grain certification system of the Grains and Legumes Nutrition Council (Australia) Certification is separate to the permissible content claims related to the levels of whole grain, $\geq 8\text{g}$ /manufacturer serve (“contains”), $\geq 16\text{g}$ (“high”) and $\geq 24\text{g}$ (“very high”). Certification eligibility is detailed in REF (6).

<p>Eligibility criteria</p>	 <p>Example:</p>
<p>Foods must be ‘core’ or must be eligible to carry a health claim according to the Nutrient Profiling Scoring Criteria of the ANZ Food Standards Code.</p>	
<p>Products must contain at least 8 grams whole grain per manufacturer serve and declare a minimum of 25% whole grain ingredients (calculated in accordance with Standard 1.2.10 of the Food Standards Code).</p>	

The Danish whole grain logo and the conditions set for using it are set by the Danish public-private Whole Grain Partnership. For more information see (5).

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Calculation of percentage of whole-grain ingredients based on dry-weight

(Example given in Appendix 4 of the Whole Grain User Manual, Denmark)

Formula for dry matter calculation – introduction

- The content of whole grain calculated as the product's dry matter is the weight of the dry matter provided by all whole-grain ingredients expressed as a percentage of the total weight of dry matter in the final product.
- The quantity of dry matter is taken from average values based on either analysis, calculation from known or factual average values for the ingredients in the product, or calculation on the basis of commonly determined and accepted data for the ingredients.
- Flour and cereal products are the main ingredients in bread. In order to calculate the whole-grain content of bread based on its dry matter, a standard value of 15% for the water content of the flour and cereal can be applied (as long as the water content does not exceed 15%). In other words, these ingredients have a dry matter value of 85%. The bread's remaining ingredients have other dry matter values. For example, seeds have a lower and vegetables a higher water content.

Recipe for a hypothetical bread:

351 g	Whole grain wheat flour
50 g	Sunflower seeds
200 g	Wheat flour
300 g	Water
50 g	Yeast
9 g	Salt
40 g	Oil
1,000 g	Ready dough in total

(the loaf weighs 900 g after baking due to evaporation during the baking process, based on a standard evaporation of 10%).

Percentage of whole-grain ingredients calculated on the basis of dry weight– generic formula:

$$\left[\frac{\text{Whole grain ingredients} \times 0.85}{\text{Whole grain ingredients} + \text{other flour and cereal ingredients} + \text{all other ingredients multiplied by their dry matter values}} \times 100\% \right] :$$

$$\left[\frac{\text{Whole grain ingredients} \times 0.85}{\text{Whole grain ingredients} + \text{other flour and cereal ingredients} + \text{all other ingredients multiplied by their dry matter values}} \times 100\% \right] :$$

Specific formula for the hypothetical recipe. Percentage of whole-grain content = 51%

$$\left[\frac{\text{Whole grain ingredients dry matter (351g} \times 0.85\text{=)} \text{ 291 g} \times 100\%}{\text{Total dry matter: 574g}} \right] :$$

Total dry matter: 574g

$(351 \text{ g whole grain wheat flour} + 200 \text{ g wheat flour}) \times 0.85\%$	468 g
$+ (50 \text{ g sunflower seeds} \times \text{dry matter value for these seeds } 95\%)$	47,5 g
$+ (50 \text{ g yeast} \times \text{dry matter value for yeast } 19\%)$	9,5 g
$+ (9 \text{ g salt} \times \text{dry matter value for salt } 100\%)$	9 g
$+ (40 \text{ g oil} \times \text{dry matter value for oil } 100\%)$	40 g

Calculation of the percentage of whole grain for the Quantitative Ingredient Declaration

QUID is the relation between the weight of all whole grain ingredients and the weight of the final product, expressed as a percentage, to be mentioned as required by regulations, on the pack.

The hypothetical bread contains 39% whole grain: $\left[\frac{351 \text{ g (whole grain wheat flour)}}{900 \text{ g (weight of bread after baking)}} \times 100 \right] = 39\%$