

WHAT IS MALT? WHY USE IT IN FOODS AND BEVERAGES?



Malting is a natural process which converts hard cereal grains into easily milled malt. Barley is usually the grain of choice for malting because it is bred specifically for the ability to process easily and generate a cascade of natural enzymes that are used in later processing to convert starch (flour) into sugar and proteins into amino acids, all of which are highly nutritious when used in brewing, distilling or food manufacture. The entire process is inherently natural using just fresh water and clean hot air to produce a unique range of colours and flavours that cannot be reproduced by any other means. It is an ideal ingredient for introducing wholegrain claims into the ingredient declaration.

The malting process starts by immersing barley in water. If the grain was sown in the ground it would use water to start growing and produce green shoots and a plant. Barley makes its own enzymes to generate nutrients. In malting this process is controlled so that the grain just starts to grow but doesn't produce a green shoot. A prime purpose of malting a grain is to release a portfolio of enzymes for use by the next processor in the chain. Inside the barley grain is a growing part (the embryo or germ) and a food source (the flour or endosperm). The flour is tightly packed and not easily ground (milled). During malting the endosperm is softened by the natural enzymes produced to remove the hard cell walls that hold the starch together. The grain is so efficient at producing enzymes that when it is milled and mixed with hot water, as in brewing, it has the capacity not only to turn all its own starch into sugar, but can also digest other starch sources such as rice or maize which are added to increase the potential alcohol generated during subsequent fermentation.

Why call the material malt? The term is derived from the predominance of the sugar maltose in the wort produced by adding hot water to milled malt. Nutritionally malt is rich in natural sugar constituents, low in fat, a source of fibre, complex carbohydrates (for slow release of energy), protein and vitamins that make it an ideal food and beverage ingredient.

Malt is a diverse product and available in different styles. Normal malt after kilning is termed white malt and is relatively low in colour. It can be further roasted to create a magnificent palette of colour and flavour variations for use in brewing and food production. There are two options for generating this increased range of malts referred to as speciality malts. If malt is taken and roasted direct from the germination box (here called 'green malt') it produces sweet fruity and caramel flavours. If the white malt is further roasted it tends to generate more burnt roasted and bitter flavours and dark colours. The final product is dependent on the roasting temperature and the length of time the malt is roasted.

Malt can be used in many forms. For brewing it is milled and mixed with hot water which enables the starch to be digested to sugars that subsequently are used by yeast to produce alcohol. The protein also within the malt creates amino acids that are key to flavour development and yeast nutrition. During malting levels of vitamin B9 (folate) can increase up to 4mg/kg. Just 100g of malt provides approximately 10% of the daily recommended intake for vitamin B12, 44% of both vitamins B1 (thiamine) and B6 (pyridoxine), 34% of vitamin B2 (riboflavin), 88% of niacin and 80% of vitamin E and in excess of 100% the vitamin B9 (folate) requirement.

Malt can also be turned into flours with various attributes such as generation of colour or tailor made to have high or low enzyme levels dependant on the application i.e whether the enzymes in the malt are required to adjust the properties of other recipe ingredients or simply contribute flavour and colour. It is a masterpiece for natural product texture control.

Malt extract is also a key product to deliver the unique attributes of malt. Again malt is mixed with hot water to digest the starch into a mixture of complex sugars and amino acids in a solution termed the wort, but the wort is then evaporated under controlled conditions to create a viscous extract. This product can have a wide range of colours, flavours and enzyme levels depending on which malts are used in the recipe. In its simplest form the extract can be used for brewing by dilution with hot water and the addition of yeast. It can also be used directly in the manufacture of many food products especially those wishing to claim the presence of wholesome natural cereals.

In a further enhanced process step the malt extract can be dried in various ways to produce a highly stable and versatile product that is easily dissolved in many brewing, distilling and baking applications. The drying processes used, such as spray drying or band drying, subtly change the product characteristics.

Malt is a unique wholesome product that enables the food and beverage industries to generate a unique palette of flavour, colour and texture which is highly nutritious as part of a balanced diet.

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