

Malt is good for you

We start with the best possible raw material...

Malt is made by germinating whole grain cereals. The consumption of whole grain cereals has been associated with many positive health effects, such as decreased risk of certain types of cancer, lowering of blood cholesterol, and risk of coronary heart disease. In fact, cereal grains have more documented positive effects on health than any other raw material, including fruits and vegetables (1).

.... and make it even better

Malting changes not only appearance and flavor, but also nutritional value of the grain. Many health promoting compounds are enriched in malting, especially during germination of the grains.

What is MALTING?



Malt production is based on the controlled germination of cereals, most often barley. The process consists of three stages: steeping, germination and kilning. During steeping, the grain is soaked in water that wakes up and activates the resting grain. The germination phase allows the grain to produce and activate its own enzymes. Due to action of enzymes, starch, proteins and cell walls are partly degraded, and as a result, the grains become friable and more water soluble. Kilning is a drying step that stops the activities of the grain and develops a pleasant flavour. The rootlets

that are formed during germination are removed, and the resulting grain is called malt. Malt is the main raw material of beer. Moreover, malt is an ingredient used in baking and some other food applications.

BETTER AVAILABILITY OF MINERALS

Minerals are essential for physiological functions and must be present in the diet. Minerals control osmotic pressure and some of these trace elements are needed as cofactors of some enzymes. Cereals are important source of certain minerals, such as iron, potassium, phosphorus, zinc and magnesium. Germination increases the bioavailability of minerals (2).

Cereals contain also phytic acid, a harmful compound due to its tendency to impede absorption of certain minerals in digestion. In the worst cases this can lead to deficiency of minerals and e.g. to anemia. During germination an enzyme, phytase degrades phytic acid and thus improves the bioavailability of minerals.

VITAMINS

Vitamins are essential compounds for human physiological functions and must be obtained from the diet. Cereals are a good source of vitamins B1, B2, B3, B6, B9 (folic acid) and vitamin E. Germination has been reported to increase especially the concentrations of folate (3) and B12 vitamins compared to non-germinated cereals. Folic acid deficiencies may lead to anemia, birth defects, and increased risk for cardiovascular disease and certain types of cancer. B12 vitamin is especially relevant for strict vegetarians as B12 is not abundant in plant materials.

DIETARY FIBER



Cereals are an important source of dietary fiber, especially water-soluble fibers, β -glucans and arabinoxylans. Water-soluble fibers have been reported to lower serum cholesterol and reduce glucose absorption by the intestine, balancing sugar and insulin contents in blood.

During the germination there is a remarkable conversion of non-soluble cereal dietary fibre into soluble dietary fibre. As a result, germinated grains contain large amount of soluble dietary fibre with low molecular weight. Some breakdown products of arabinoxylans have been shown to have prebiotic effects (4), i.e. they are food for beneficial probiotic bacteria.

PROTEINS

Cereals are a natural source of plant protein, and germination does not in general affect the protein content. Hydrolytic enzymes that activate during the germination modify the cereal proteins by increasing the content of short peptides. Unlike the native cereal protein these peptides can be used for example by growing yeast. Future research effort will shed some light on the possible beneficial effects of this modification.

ANTIOXIDANTS

Antioxidants protect the cells against oxidative stress. Vitamins, sterols and phenolic compounds, as well as phytic acid are antioxidants present in cereals.

Phenolic compounds

In cereals, phenolic compounds are either in free or bound form. Malting liberates the bound substances and increases the total amount of phenolic compounds in the grain (5). In diet these can have positive health effects as anti-carcinogenic, antioxidant, and anti-inflammatory substances. Alkylresorcinols e.g. are phenolic compounds in rye, wheat and barley. A phenolic compound of barley, hordatine, may increase human well-being by stimulating the movement of digestive track. Avenantramides are phenolic compounds in oats.

Sterols

Sterols are steroid alcohols present in grains. In diet they may lower blood cholesterol levels being beneficial for human health. Germination has shown to increase sterol contents of

grains (6).

Maillard Products

Maillard compounds are formed in heating processes in reaction of sugars with amino acids. Maillard products formed during kilning of malt give malt colour and flavour. Some of these products are antioxidants.

SUMMARY

Malt is a healthy ingredient for making beer and beverages. It has also a huge potential in many food applications in the human diet. Germination can be seen as a way of accumulating natural bioactive compounds - grains or sprouts rich in natural bioactive compounds can be consumed as functional foods to prevent chronic diseases (7).

References:

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