An introduction to traditional grains

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Summary

Wheat, rice and maize dominate the world food market accounting for more than 80% of all grains produced [1]. These grains produce high yields under favourable conditions, which means much water, inorganic fertilizers, pesticides and a highly mechanized agriculture. As we are progress-sing into the drier "Greenhouse Age" other grains have advantages. The traditional grains are well adapted to harsh conditions and are e.g. drought tolerant. The traditional grains include sorghum and different millets from Africa, quinoa and amaranth from South America, spelt wheat and buck wheat and many more.

Many of the traditional grains are nutritious with good amounts of the essential amino acids, antioxidants and are good source of minerals and fibre important for human health and growth. Further, coeliac disease and wheat intolerance is an increasingly recognised problem in Europe and many traditional grains are suitable as they are naturally free of gluten.

Traditional grains

The global cereal production is about 2 billion tonnes with the majority coming from wheat, rice and maize [1]. These grains give high yields but require much water and a mechanized agriculture.

Figure 1. Red sorghum

There is also a risk in this "monoculture" of grains because insects or microbes may cause massive crop failure and pesticides are therefore commonly used. The demands for decreased CO_2 emissions, limited fresh water supply and decreased chemical use are growing strong, but the global food production depends heavily on the large crops of the main grains.

Apart from the large quantity, global grains there are many other grains cultivated around the world. In Africa alone there are more than 100 different grasses that have seeds which are consumed as food [2]. These grains are mainly grown for subsistence and are loosely referred to as "traditional grains". These are both cereal grasses and grass-like grains known as pseudocereals. The traditional grains are less developed by breeding and therefore have lower yield, but they often grow under harsh conditions. Amaranth and quinoa from central and south America are often cultivated at high altitude. Sorghum and several millets from the semi-

arid African tropics are uniquely drought tolerant. The traditional grains can be grown without access to machinery, inorganic fertilizers and pesticides, and still produce a secure crop in harsh environments.

Figure 2. Dough made from sorghum protein [3] (upper), bread baked from maize protein and starch (middle) and poppet amaranth (lower).

The development of traditional crops requires a stable market to attract development efforts. A stable market requires trade and commercial products from the grains, but this in turn requires a stable supply. This negative feedback needs to be broken through development of trade of traditional grains and development of new products.

There are good opportunities for both trade of traditional grains as well as new products. Many of the traditional grains are rich in anti-oxidants and have cholesterol lowering components, have high content of minerals and proteins and are also “exotic” to the Western market which makes them suitable as a “healthy choice” or as functional foods. Many traditional grains are naturally gluten free which is important for the ~1% of the population effected by celiac disease. New products are being introduced and some examples are popped amaranth suitable for e.g. breakfast cereals and gluten free bread formulations containing sorghum and tef.

Some of the more common traditional grains are presented in Table 1 including their Swedish names where available. These grains will be presented in more detail in the following chapters.

Table 1. A selection of traditional grains including origin and Swedish names.

Grain	Latin name	Origin	Swedish name
Amaranth	*Amaranthus caudatus*	South America	Amaranth
Buck wheat	*Fagopyrum esculentum*	Asia	Bovete
Finger millet	*Eleusine coracana*	East Africa	Korakan, prydnadsgräs
Fonio	*Digitaria exilis, -iburua*	West Africa	–
Pearl millet	*Pennisetum glaucum*	West Africa	Pärlhirs
Quinoa	*Chenopodium quinoa* Willd	South America	Quinoa, mjölmolla
Sorghum	*Sorghum bicolour*	Africa	Durra, sorgum
Spelt wheat	*Triticum spelta*	Middle East	Dinkel, spelt, gammelvete, speltvete
Tef	*Eragrostis tef*	East Africa	Teff, tef

References

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