FAQ

1. What are pseudo-cereals?

The 'pseudo-cereal' group are not part of the Poaceae botanical family, in which 'true' grains belong, however they are nutritionally similar and used in similar ways to 'true' grains. Many of these, such as amaranth, buckwheat and quinoa (pronounced 'keen-wah')come under this category.

2. Write a note on the carbohydrates from cereals.

In adult diet calories are recommended to be derived from complex carbohydrates present in cereals. Carbohydrates constitute 80 percent of the dry matter of cereals. Whole grains provide about 350 Kcals per 100g. Cereals provide 70-80 percent of the daily energy intake of large section of the population in India. Cereal grains are largely composed of starch, a complex carbohydrate. Other carbohydrate constituents present are cellulose, hemicellulose and pentosans which constitute dietary fibre. Due to high fibre content, whole cereals are considered important for the maintenance of good health. Small amount of dextrin, sucrose, raffinose, glucose and galactose are also present

3. Why popping and puffing are known as traditional and contemporary method of cereal processing ?

This is a traditional food processing methods used for the preparation of expanded cereals and grain legumes to prepare ready-to eat-products. It has been reported that the traditional popping or puffing as well as contemporary methods i.e roller drying and extrusion cooking of cereal processing could be successfully applied to foxtail millet to prepare ready- to- eat products, thereby increasing its utilization as a food. The traditional beaten cereal, puffed cereal are traditional products whereas the same rolled and flattened cereal ingredients combined with sugar,flavour and liveners are common breakfast cereals today.

4. What are the minerals present in cereals?

In cereals, calcium and iron are not present is good amount but the grains contribute significantly due to fairly large amounts of cereals consumed daily. Among cereals rice is poorer in these two minerals as these are lost during milling and polishing. Millets contain good amount of minerals and fibre. Rye, oats and ragi are very good sources of calcium. As the main storage form of phosphorus present in cereals is phytin, hence it affects adversely the bioavailability of minerals especially calcium, magnesium phosphorus, zinc and iron. Some trace minerals i.e.

copper, zinc and manganese are present in small amounts in cereals.



5.Draw a labelled diagram of rice.

6.Describe the origin and importance of barley.

Barley (*Hardeum vulgare*) is among the most ancient of the cereal crops. The original area of cultivation has been reported to be in the Fertile Crescent of the Middle East, in present day Lebanon, Iran, Iraq, and Turkey. There is now considerable evidence that barley was under cultivation in India and China considerably later then in Middle East. Barley played an important role in ancient Greek culture as a staple bread making grain, as well as an important food for athletes, who attributed much of their strength to their barley containing training diets. Gladiators were known as *hordearii*, which means eaters of barley. In almost every culture through the ages, barley foods are described as having almost mystical properties, and barley is often referred to as the king of grains.

7.Why should cereals be consumed with legumes?

The protein content of cereals varies as they contain 6-12 g protein per 100g and can easily meet more than 50 percent of the daily protein requirement of an adult. Cereal protein consists of albumin, globulin, prolamine and glutelins. The quality of cereal protein is not very good as that of the animal protein because cereals proteins lack the essential amino acid lysine. Hence cereals should be taken in combination with the legumes or milk and milk products.

8. What is the importance of cereals for the farmers?

Different cereals grow under different agro-climatic conditions e.g. sorghum and millets grow well in semi-arid conditions, deep water rice

in arid regions while rye and oats require cold climates. Cereal plants range in height from 30 cm (e.g., teff) to 300 cm (pearl millet and sorghum). Most cereals are thin-stemmed grassy plants, but maize, sorghum and pearl millet have thick stems more similar to sugarcane than grass. Cereal crops provide the farmer with straw for fodder and thatch, as well as grain for the family and the market.

9. What is the historical importance of rice?

Rice (*Oryza sativa*) crop originated in Asia and has been a staple food, since the Ice Age in the North. The geographical site of original rice domestication is yet not sure. Actual rice grains and husk have been excavated in India that were more than 4500 years old and in China more than 5000 years. According to ancient Greek writers, rice reached Europe around 3000 B.C having been brought from India by Alexander the Great.

10. Why oats is called a secondary crop?

Oat (*Avena sativa*) Domesticated oats appear relatively late, and far from the Near East, in Bronze Age Europe. Oats, like rye, are usually considered a secondary crop, i.e., derived from a weed of the primary cereal fields of wheat and barley. As these cereals spread westwards into cooler, wetter areas, this may have favoured the oat to its domestication. They have a lower summer heat requirement and greater tolerance of rain than other cereals, such as wheat, rye or barley, so are particularly important in areas with cool, wet summers, such as Northwest Europe and even Iceland.

11. Which crop is known as the primary cereal of the temperate world?

Wheat (*Triticum aestivum, Triticum durum*) is considered as the primary cereal of temperate regions. Wheat can resist snow fall and can be grown well in the plains of the temperate regions. It has a worldwide consumption, but it is a staple food of North America, Europe, Australia, New Zealand, most of the Southern Cone and much of the Greater Middle East.

12. Based on the Calorific value (kcal/100 gm) name the grain with the highest and the least energy?

The Calorific value of Corn (*Zea mays*, L.) is the maximum amongst the cereals at 352 kcal/100 gm and Rice (*Oryza sativa*, L.) has the least with 310 kcal/100 gm. All the other cereals fall in between this range.

13. Write a note on the importance of cereals bran?

Bran along with germ, is an integral part of whole grains, and is often produced as a by-product of milling in the production of refined grains. Bran is milled from all cereal grain, including rice, corn (maize), wheat, oats, barley and millet. Bran is particularly rich in dietary fiber and essential fatty acids and contains significant quantities of starch, protein, vitamins and dietary minerals. Rice bran oil is a very popular oil for Indian cooking.

14. What is amylase and its importance in cereals?

Amylases is an enzyme that helps digest carbohydrates. *Amylase* is an enzyme, or special protein, produced by the pancreas and salivary glands. *Amylase*, any member of a class of enzymes that catalyze the hydrolysis (splitting of a compound by addition of a water molecule) of starch into smaller molecules like glucose. Most of the carbohydrates in cereals are made of starch. To digest this starch amylase enzyme is required.

15. Write a note on the structure of cereals.

Cereal grains are the fruit of plants belonging to the grass family (Gramineae). Botanically, cereal grains are a dry fruit called a caryopsis. The caryopsis fruit has a thin, dry wall which is fused together with the seed coat. There are a few important structural features that the cereal grains have in common. All of the cereal grains are plant seeds and contain three distinct anatomical portions a large centrally located starch endosperm, which also is rich in protein, protective outer layers such as hull and bran, and an embryo or germ. The seed portion of cereals consists of numerous components which basically include three parts: a seed coat or testa (bran), storage organ or nutritive reserve for the seed (endosperm), and a miniature plant or germ. The aleurone layer which is just below the seed coat, is only a few cells thick, but is rich in oil, minerals, protein and vitamins. Starch and protein are located in the endosperm which represents the bulk of the grain and is sometimes the only part of the cereal consumed. Starch is arranged in the form of sub-cellular structures called granules that are embedded in a matrix of protein. The developing endosperm contains protein bodies which become a continuous phase as the grain matures. There is generally a gradient of more protein and less starch per cell from the outer to the inner region of the endosperm.

16.How oats are consumed?

Oat is popular worldwide as a breakfast food. In human consumption,

oats can be served as porridge, as oatmeal although oats could be eaten in various different forms other than rolled oats, including unprocessed oats. As oats is not widely grown in India, but in recent times commercially ready to cook oats is quite popular as "masala upma" a south Indian breakfast food.