Cereal seeds are the seeds or grains of cultivated grasses. They are often referred to as a staple food, which means they form a major part of our diet. Cereals are cheap to buy and easy to grow and store. They are healthier compared with animal foods and they are filling and nutritious. Cereals can be eaten in large quantities and in some developing countries cereals may provide the only source of protein in the diet.

The Structure of Cereal Seeds:

All cereal seeds have the same basic structure, but vary in shape, size, colour and texture. The nutrient content of different cereals varies slightly.

- **The Bran Layer** – contains antioxidants, B-vitamins & fibre.
- **The Endosperm** – contains starchy carbohydrates, proteins and small amounts of vitamins and minerals.
- **The Germ** – contains many B-vitamins, some protein, minerals and healthy fats.
The Types of Cereals:

**Rye—Segala**

**About:** Rye is a cereal grain that looks like wheat but is longer and slenderer and varies in colour from yellowish brown to greyish green.

**Nutrition:** Rye is a good source of fibre, vitamin E, calcium, iron, thiamine, phosphorus, and potassium but is lower in protein than wheat. Because it is difficult to separate the germ and bran from the endosperm of rye, rye flour usually retains a large quantity of nutrients, in contrast to refined wheat flour.

**Products:** Rye is specifically used in rye bread and crisp breads.

**Rice—Ross**

**About:** It is the staple food of many countries since it can be grown easily, and it is cheap. There are more than 7000 varieties of rice and are categorized by; size, shape and region where they are grown. These include short grain rice and long grain rice.
**Nutrition:** Rice is a complex carbohydrate, which means that it contains starch and fibre. It is also low in fat, contains some protein and plenty of B vitamins.

**Products:** Some food which are made from rice are: rice crackers, rice bread etc.

**Types of Rice:**

<table>
<thead>
<tr>
<th>Type of rice</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>***Long-grain rice</td>
<td>Curries and risottos</td>
</tr>
<tr>
<td>Long-grain parboiled rice (partially cooked)</td>
<td>Salads, curries and risottos</td>
</tr>
<tr>
<td>***Short grain rice</td>
<td>Milk Puddings</td>
</tr>
<tr>
<td>*Basmati rice</td>
<td>Mainly used in Indian dishes</td>
</tr>
<tr>
<td>**Brown long-grain rice</td>
<td>Curries and risottos</td>
</tr>
<tr>
<td>Ground rice</td>
<td>Puddings, soups, cakes and biscuits</td>
</tr>
<tr>
<td>Jasmine rice</td>
<td>Used in Chinese and Thai dishes</td>
</tr>
<tr>
<td>Sushi (or sticky) rice</td>
<td>Sushi dishes</td>
</tr>
</tbody>
</table>

***White rice*** is refined rice, being made up of starchy endosperm. It comes as short, medium and long grain rice.

**Brown rice** has had only the outer husk removed and the germ and the endosperm still remain. It has a high NSP content.

**Wild rice** is in fact not true rice but a grass. The grains are long and thin and nearly black in colour. It takes longer to cook.
Home Economics Form 3

*Basmati rice* is usually known for its distinctive fragrance and has a light texture. The long grain swells up to three times in length when cooking.

**Maize- Qamhirrum**

**About**: Maize also known as corn, is a cereal grain first domesticated by indigenous peoples in southern Mexico about 10,000 years ago.

**Nutrition**: Maize is an excellent source of energy, carbohydrates and good quality oil. It is more complete in nutrients in comparison to other cereals. Consumption of maize with a legume is an effective means of improving protein quality in the diet.

**Products**: Food made from maize include maize bread, maize oil, etc.

**Oats- Hafur**

**About**: The oat, sometimes called the common oat, is a species of cereal grain grown for its seed, which is known by the same name. While oats are suitable for human consumption as oatmeal and rolled oats, they are also used for livestock feed.

**Nutrition**: Ideal for people with celiac disease, since pure oats can provide a ready source of nutrients that are often lacking in their diet. Oats also provide iron, protein and fibre.

**Products**: Oats are used to make porridge and a wide variety of cakes and biscuits. Some products made from Oat are: Quaker Oat, bread and pottage. Beer can also be made from oats. Pottage is a kind of soup-stew made from oats.
Barley – Xgħir

About: Barley is a wonderfully versatile cereal grain with a rich nutlike flavour and an appealing chewy, pasta-like consistency.

Nutrition: Barley provides useful amounts of the minerals copper, phosphorus and zinc. Barley is rich in fibre, particularly the soluble fibre beta glucan and pectin – the type that can help lower high blood cholesterol.

Products: Barley is brewed for whisky and beer. Whole barley grains, pot barley and pearl barley can be added to thicken soups or stews. Barley flakes are often added to muesli and other breakfast cereal mixes.

Wheat – Qamħ

About: Wheat is a major cereal crop in many parts of the world and is the most common cereal. It is classified in various criteria including strength and species. It is milled to produce flour which is then used in various products – bread, biscuits, cakes, pasta.

Nutrition: Wholegrain wheat contains useful amounts of several of the B vitamins including thiamine, riboflavin and niacin and also vitamin E. It also contains potassium, iron, magnesium and zinc as well as trace elements such as selenium.

Products: Wheat is found in breads, biscuits, cakes, pancakes, pasta, pastry and breakfast cereals.
Different types of flour made from wheat:

<table>
<thead>
<tr>
<th>Flour Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholemeal flour</td>
<td>The Whole grain of wheat ground up to produce flour. It has a dark brown colour and has a 100% extraction rate (100% of the grain included in the flour). It is rich in Dietary Fibre (NSP)</td>
</tr>
<tr>
<td>Brown or Wheatmeal flour</td>
<td>Contains 85% of grain, some of the bran layers are removed and therefore has a light brown colour. It contains less NSP.</td>
</tr>
<tr>
<td>White flour</td>
<td>Contains 72% of whole grain, with the germ, bran fat and minerals removed, leaving smooth white flour. This could be bought as plain or self-raising flour</td>
</tr>
<tr>
<td>Strong flour</td>
<td>It is milled (mithun) from spring wheat, has a high gluten content and is suitable for bread making (flaky pastry and pasta)</td>
</tr>
<tr>
<td>Soft flour</td>
<td>It is milled from winter wheat, has only a small amount of gluten and is suitable for cakes.</td>
</tr>
</tbody>
</table>

Millet (Millet)

About: Millets are a group of highly variable small-seeded grasses, widely grown around the world as cereal crops or grains for fodder and human food.

Nutrition: Millet is important because of its uniquely high content of nutrients, including impressive starch levels, vitamin B, calcium, iron, potassium, zinc, magnesium, and healthy fats.

Products: Millet bread, millet crackers etc.
Pseudo-Cereals

Pseudocereals are plants that produce fruits or seeds which are used and consumed as grains, though botanically pseudocereals are neither grasses nor true cereal grains. Pseudocereals are typically high in protein and other nutrients, gluten-free, and are considered whole grains. Examples of pseudocereals are:

- Amaranth
- Buckwheat
- Quinoa
- Chia Seed

Nutritive Value of Cereals

Cereals are important foods in our diets as they contain high proportion of carbohydrates, LBV protein, fat, vitamin B group and minerals. Whole grain cereals are a good source of dietary fibre.

Refined vs Unrefined Cereals

Refined cereal means that the wheat has the bran and germ removed, and therefore only the endosperm is used - therefore the nutritional value and fibre content are lost through this processing called milling. In some cereals, fibre, minerals and vitamins are added back, but it does not have the same value as the original. Refined cereal products include: white breakfast cereals, desserts, white bread, white pasta, white crackers, white rice, pizza and biscuits.

Unrefined cereals on the other hand means that the all the parts of the grain are used, and nothing is added or removed. Therefore, including all the nutrients. These unrefined cereals reduce the risk of constipation, heart disease, stroke, cancer, diabetes and obesity. Unrefined cereal products include: whole meal flour, brown rice, wholegrain cereals (oats, rye, corn, wheat and rice).
Storing Cereals

Cereal products should be stored in a well ventilated cool, dry place. They absorb moisture in a damp place and may go mouldy. Wholegrain cereals keep fresh for a shorter time than refined cereals because of the fat content in germ. Cereals are prone to be attacked by insects and should be regularly inspected if stored for long periods of time.

- Do not put exposed food on shelves. Store foods in containers with tight-fitting lids. Plastic bags are not good.
- Clean containers before refilling. Glass containers are the best storage material for cereals as they are hygienic, easy to clean and environmental friendly.
- Regularly clean shelves, bins, etc with soap and water. Corners may breed eggs so wash or vacuum to remove traces.
- Do not mix old food with new food.
Effects of Heat on Cereals

With cooking, the digestibility and palatability of cereals improve. When a mixture of starch and liquid is heated, the starch granules absorb water, causing them to swell, soften and become translucent. Gelatinization is when liquid thickens because water moves into the starch granules and cause them to swell.

**Fortifies:** The addition of nutrients to a food. These nutrients may have not been present or were present in very small amounts. Also used to prevent widespread deficiency.

**Enriched:** The addition of nutrients to a food which may have been lost in processing.