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***ASSIGNMENT 2***

***DISCUSS the following cereal processing methods, stating the applications, types, equipment used, merits and demerits***

***FLAKING AND BAKING***

Cereal crops provide essential nutrients and energy in the everyday human diet through direct human consumption and also via meat production since they comprise a major livestock feed.Each type of cereal requires a specific post-harvest treatment, however, there are certain general principles that apply to most of them. Cereals undergo a number of processing stages between harvest and consumption. This chain of processes is often referred to as the total post-harvest system. The post-harvest system can be split into three distinct areas. The first is the preparation of harvested grain for storage. The second, which is referred to as primary processing, involves further treatment of the grain to clean it, remove the husk or reduce the size. The products from primary processing are still not consumable. The third stage (secondary processing) transforms the grains into edible products.

***Primary*** ***processing***: this involves several different processes, designed to clean, sort and remove the inedible fractions from the grains. Primary processing of cereals includes cleaning, grading, hulling, milling, pounding, grinding, tempering, parboiling, soaking, drying, sieving.

***Secondary*** ***processing*** ***of*** ***cereals*** (***or*** ***'adding*** ***value'*** ***to*** ***cereals***): this is the utilisation of the primary products (whole grains, flakes or flour) to make more interesting products and add variety to the diet. Secondary processing of cereals includes the following processes: fermentation, baking, puffing, flaking, frying and extrusion.

* ***Puffing:*** Puffed grains are often used as breakfast cereals or as snack food. During puffing, grains are exposed to a very high steam pressure which causes the grain to burst open. The puffed grains can be further processed by toasting, coating or mixing with other ingredients.

***Flaking:*** Flaked cereals are partially cooked and can be used as quick-cooking or ready to eat foods. The grains are softened by partially cooking in steam. They are then pressed or rolled into flakes which are dried. The flakes are eaten crisp and should have a moisture content of below 7%.

* ***Fermentation:***. Doughs made from cereal flour can be fermented to make a range of products.
* ***Baking:*** Doughs and batters made from cereal flours are baked to produce a range of goods.
* ***Extrusion:*** Extrusion involves heating and forcing food (usually a dough) through a small hole to make strands or other shapes. The extruded shapes then undergo further processing such as frying, boiling or drying. Extruded products include pastas, noodles, snack foods and breakfast cereals.

***FLAKING***

Cereal flakes is a food product made of corn, wheat, rice, oats, and other cereal grains; it is prepared by removing the outer coating from the seed, processing the grain into groats, cooking the groats in a sugar and salt syrup, and rolling out the meal into thin flakes, which are then toasted in oven.

The types of cereal flakes produced in the USSR are ready-to eat corn and wheat flakes, requiring no cooking; they are either plain (natural), sugar and chocolate-coated, or salted. Oats are rolled into uncooked flakes (known as Hercules flakes) for making oatmeal.

***Flaked* *Cereals include:***

* **Corn** Flakes.
* Bran & Wheat Flakes.
* Multigrain Flakes.
* Sugar Coated Flakes.
* Oat Flakes.
* Oat & Rice Multigrain Flakes.

***BAKING***

In the bakery sector, the doughs or batters form a continuum stretching from high-moisture systems such as wafer biscuits and cake batters, through the different types of bread doughs, to the low-moisture biscuit and pastry doughs. All these products are based on cereal flours, usually wheat flour, with appropriate additions of egg, sugar and fats to give the traditional recipes for the products. There is a common order to the processing methods employed, with ingredients being mixed with water to form a dough or batter, then subdivided into portions for the second stage of processing by the application of heat. Most of these products are heated in an oven to form their structures, except for wafer biscuits and pasta, which have their own unique thermal processes, with the heated wafer plate and boiling water, respectively.

Cereal products have been a classic staple food of humankind for centuries. All over the world, bread, baked goods, pasta and cereals are a vital source of carbohydrates, protein and dietary fiber. The fortification of cereal products with minerals is therefore an effective source to offer health-aware consumers an everyday source of minerals

***EQUIPMENT USED IN CEREAL PROCESSING***

### A range of unit machines combined with the process knowledge and engineering expertise to integrate them into reliable and flexible high-output systems which includes extruders, cereal cookers, flaking rolls, shredders, toasters and syrup coating units that can be used to form versatile plants.

***Merits* *Of* *Baking* *and* *Flaking***

* ***Low*** ***in*** ***fat:*** Bakedfoods are considered healthy because of their low-fat content. ...
* ***Rich*** ***taste:*** When it comes to taste, bakedfoods are versatile because they cook more in their own oil, making them more juicy and flavour-rich.
* ***More*** ***nutrients:*** Since minerals and some vitamins are water-soluble. They can be lost through boiling as they leech into the water. Baking on the other hand uses dry heat thus preserving these minerals and vitamins like vitamins B and C.
* ***Management*** ***of*** ***weight:*** As a consumer of baked foods, you are guaranteed to ingest less oil lowering the risk of fat deposition in your body is very low. Thus, you can count on baked foods to slow down the addition of weight and prevent obesity.
* ***Beneficial* *for* *Heart* *disease:*** Low fat foods keep your stomach full, thus decreasing the intake of unnecessary unhealthy food. Lack of cholesterol ensures that corn flakes are ideal as day starters for people having heart diseases.
* **Visual appeal and increased appetite .**