

Unit –IV

EXTRUSION BASED SNACKS

Hot extrusion and Cold extrusion methods

Cold Extrusion

The elevated cooking temperatures used in normal extrusion lead to discoloration of whey proteins from the Millard reaction, racemization of protein during cross-linking, destruction of the sulphur-containing amino acids, cysteine and methionine, and other problems. In cold extrusion heating of food is carried out up to 100 °C called cold extrusion. In Cold extrusion, food temperature is constant which is used to shaping and mixing of food including meat products and pasta. Temperature less than 100 °C is also used for low pressure extrusion. Ex. Pet Foods. Chilling, baking or drying methods are used for the preservation of cold extruded products. While extrusion cooking eliminates contaminating micro-organisms and preserve the dry food products for longer period. Packaging of dry products prevents the oxidation and moisture absorption while storage. Cold extruders are appropriate for small scale industry and also for household use. Extruder cookers are used by only large scale industries because they are high in cost. The primary use of cold extruders is in pasta creation, albeit comparable machines are utilized to frame roll batter into various shapes. A pasta extruder is utilized to make a wide range of pasta utilizing mixture produced using durum wheat flour (or 'semolina') and eggs. By adding tomato purée or spinach paste coloured paste also made. There are various types of extruder are available which are used in small scale manufacturing and food outlet from manual operating to fully automatic machines. The pasta extruder has different parts such as die, extruder barrel and mixing chamber which are used for making of specific shape of paste. Many equipment manufacture companies make the die from plastic, stainless steel or preferring bronze, which they guarantee that it gives harsh surface to the pasta that, holds sauce superior to any pasta made by different techniques. They are cut into specific size and shape after the rise up out from the die. Rigatoni is firstly extruded and then cut into specific size (straight for rigatoni or angled for penne rigati). Pasta is not only immediately cooked but also dry for retail sell. Pasta is also preserved up to six months.

Hot extrusion

Hot extrusion is also known as extrusion cooking in which heating of food is carried out at more than 100 °C. Frictional heating and other heating methods is used to increase the temperature quickly. After the heating of food it is passed to barrel sections which have a small flight which helps to increase the shear and pressure. At last, food is passed from the die under pressure, after the final shaping food is cooled quickly to remove moisture in the form of steam. Product is formed into many type of shapes such as shells or squirls, doughnuts, strips, rods, tubes and spheres. Different types of food product are formed by extrusion cooking including puffed

cereals (RTE), expanded snack foods etc. Extruders are the single screw or twin screw equipment. Twin screw extruder are not affordable by small scale industries because they have high maintenance and capital cost as compare to single screw extruder.