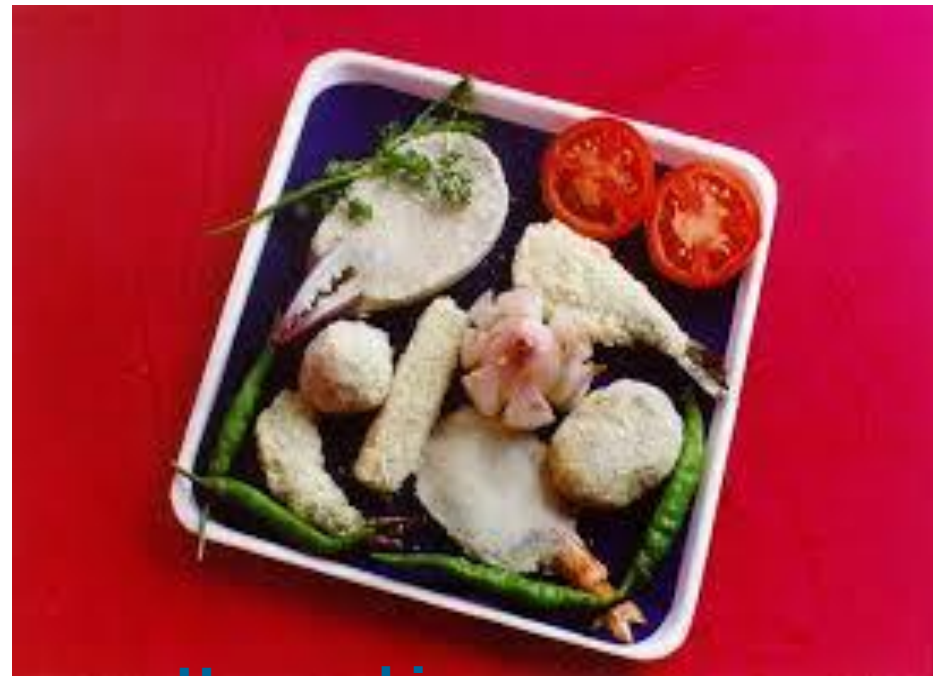


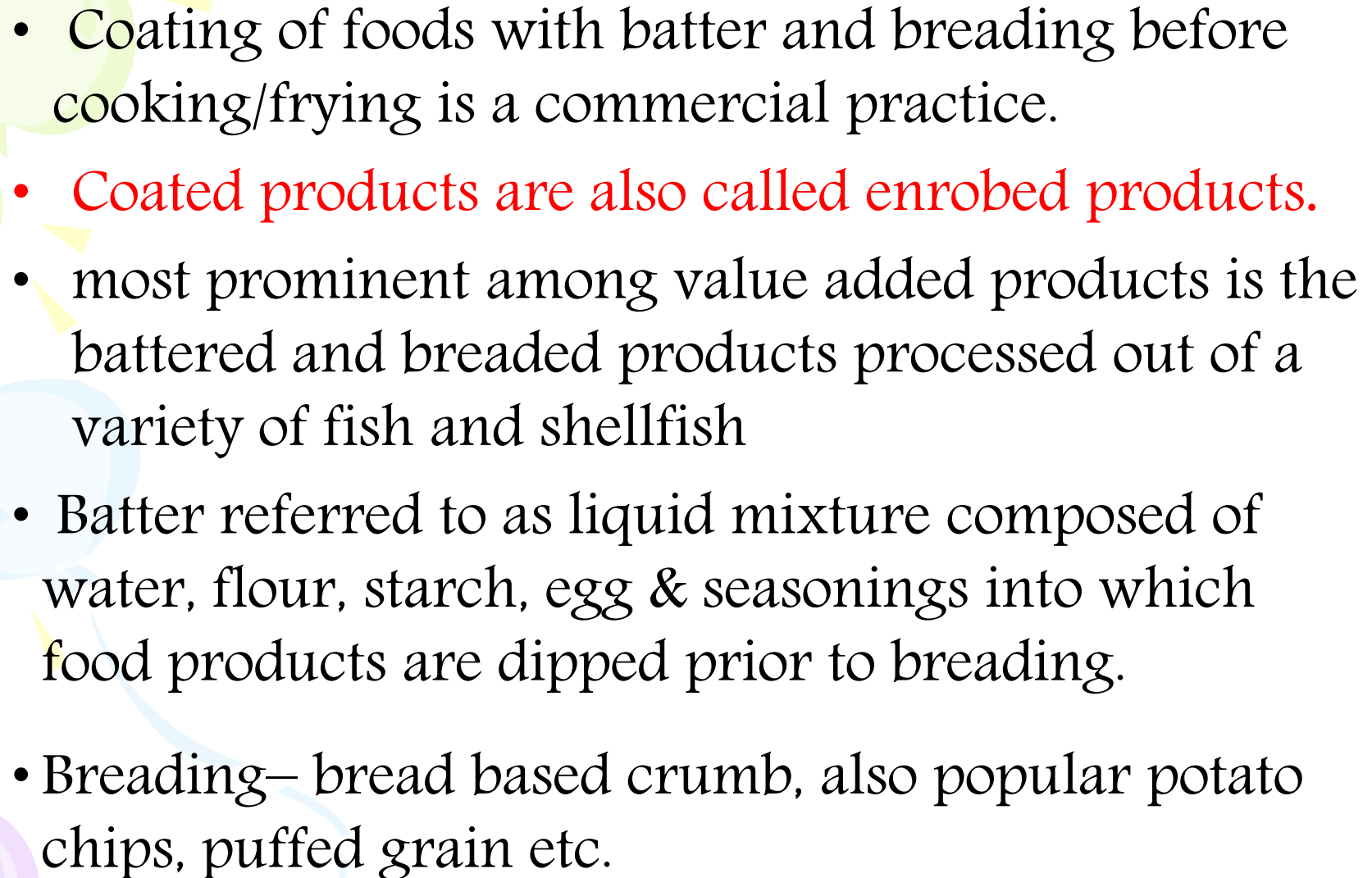
DIVERSIFIED FISH PRODUCTS

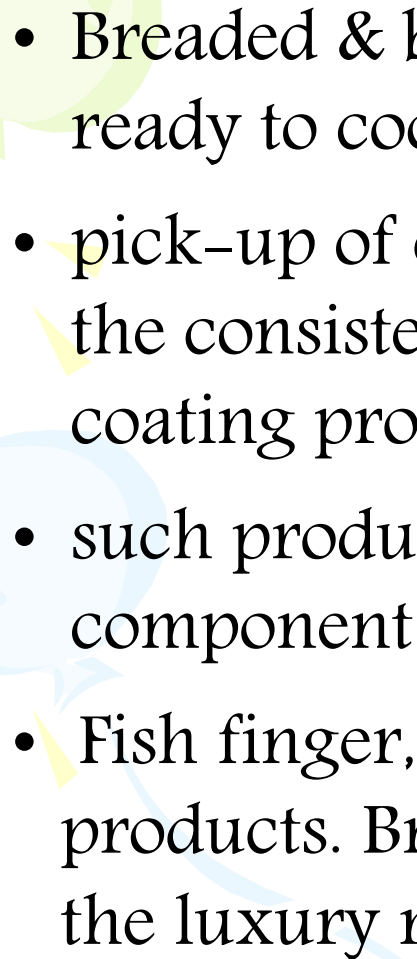
❖ BATTERED AND BREADED PRODUCTS

- FISH FINGER**
- FISH CUTLET**
- FISH WAFER**
- FISH SOUP POWDER**
- IMITATION PRODUCTS**



Hauzoukim

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- Coating of foods with batter and breading before cooking/frying is a commercial practice.
 - **Coated products are also called enrobed products.**
 - most prominent among value added products is the battered and breaded products processed out of a variety of fish and shellfish
 - Batter referred to as liquid mixture composed of water, flour, starch, egg & seasonings into which food products are dipped prior to breading.
 - Breading— bread based crumb, also popular potato chips, puffed grain etc.

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- Breaded & battered products when frozen in a ready to cook form— ‘convenience foods’.
 - pick-up of coating can be increased by adjusting the consistency of the batter or by repeating the coating process.
 - such products should have a minimum fish component of 50%.
 - Fish finger, cake, cutlet, fish portion are staple products. Breaded shrimp, scallop & oyster are for the luxury market.

Functions of coating :

- **Batters & breading perform as coating :**
- Enhance appearance, flavor & texture of food product.
- More desirable color.
- Acts as moisture barrier, minimize moisture loss during microwave heating & frozen storage.
- Acts as food sealant, prevent natural juices from coming out during freezing or reheating & seal flavour.
- Maintain crisp on the outside, tender and juicy inside.

Coating ingredients :

Functionality of coating – total characteristics of coating ingredients.

Coating ingredients grouped into :

Polysaccharides : wheat, corn flour, starch, -modified derivatives of cellulose & gums.

Proteins: milk powders, milk protein fraction, egg albumin, cereal flours, seed protein,

fat & hydrogenated oil.

Seasonings: sugar, salt, pepper & other spices/spice extractives and **Water.**

Function of coating ingredients :

i) Flour : Finely ground wheat.

Refers to finely ground starchy material of corn, rice, soy or barley.

Functionality depends on starch & protein constituents in it.

ii) Leavening agents :

Sod. Carbonate, leavening acids/salts used to produce CO_2 in puff or tempura batter. eg. Tartaric acid, Pot. hydrogen tartrate, Sod aluminium phosphate, Monocalcium phosphate anhydrous etc.

iii) Egg :

Albumin, a heat coagulable protein.

Helps in binding batter & breading to the product & to itself.

iv) Milk & Whey:

Added as liquid or dry powder, provide lactose which is a reducing sugar. Also provide protein that gives structure.

v) Salt & sugar :

Salt as flavouring agent.

Sugar added for sweet flavour occasionally.

vi) spices:

Added to impart flavour & color. Eg. Pepper, paprika

vii) Gum :

Hydrocolloid substances.

vii) Shortenings & oil :

Contribute to overall flavour & mouth feel.

Tenderize the coating due to lubricity & interaction with other ingredients.

vii) Prepared breadings:

Material applied to battered foods to enhance their appearance & organoleptic qualities.

Bread crumbs, corn flakes, fragile bread crumbs produced as oriental crumbs.

BATTER : Classified into 2 groups viz;

i) Conventional or adhesive batter

Used with supplemental breading or bread crumbs.

Purpose is to increase crumb adhesion by acting as an interface between food & coating.

Typical ratio of batter mix to water is 1:2.

Puff or tempura batter

- Batter used to provide an aerated crisp coating with or without application of other coating.

ii) Combination of wheat & rice flour with a chemical raising agent are used.

BREADINGS :

Secondary coating.

May not always derived from bread

Types of breading :

i) Reclaimed bread crumb :

Prepared from ordinary bread by drying & grinding.

ii) Industrial crumbs :

Uses a raising agent, lower qty of water & bread as continuous loaf before grinding.

Widely used in fish fingers/sticks etc.

iii) Japanese style/oriental/panko crumbs :

Characteristic flake like elongated str, excellent visual appeal & provide unique surface texture when fried.

v) Extruded crumbs :

High starch ingredients are cooked under pressure.

Pressure released suddenly – moisture expands as steam & extrudate expands.

v) Cracker meal :

Flour made into dough with water & rolled into a thin sheet & baked.



Steps involved in coating :

a) Portioning/Forming :

- The fish stick is usually cut from fish blocks in a series of separate band saw operation.

b) Predusting :

- Predust is very fine, dry, raw flour material.
- Sprinkled on the moist surface of the frozen seafood substrate before any coating
- Creates more conducive surface for batter adhesion
- most commonly used : wheat flour, gums & proteins, spices.

c) Application of batter :

- Predusted product conveyed to batter applicator
- Transferred to next conveyor which draw it through batter.
- Fish portion totally submerged in batter.

d) Application of breading :

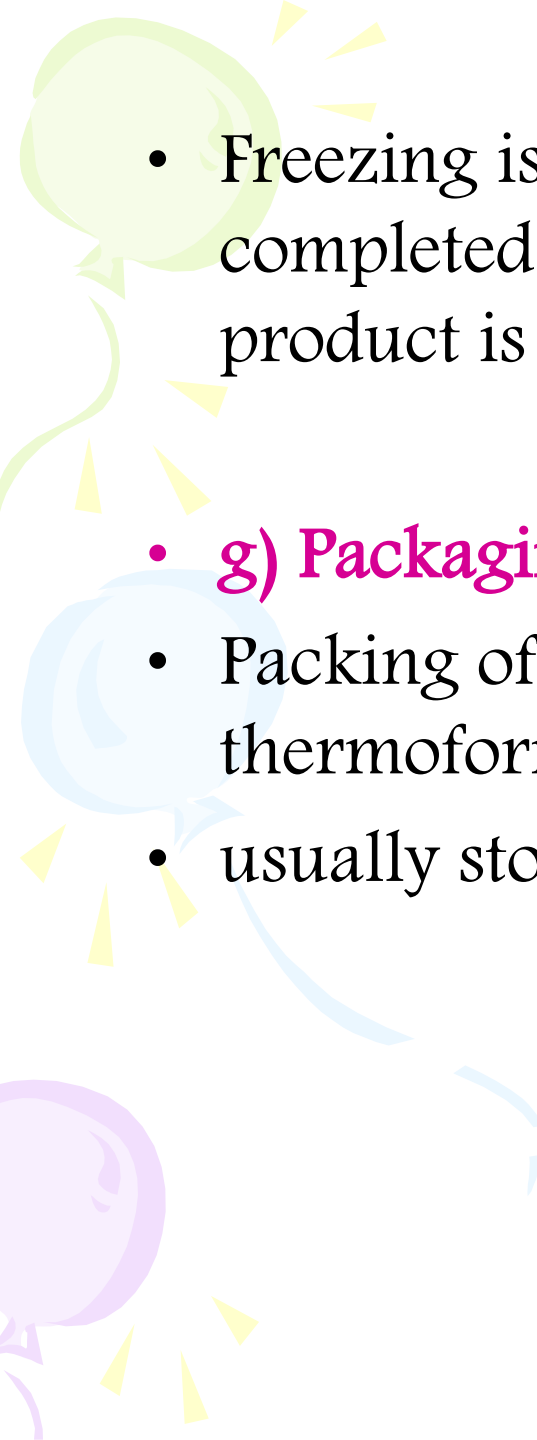
- Pressure roller –apply sufficient force to press crumbs onto battered product.
- Specially designed breading machines – apply uniform particle size distribution or granulation to both top & bottom of the product with minimum crumb breakdown.

e) Pre-frying :

- Pre-frying in oil is followed by freezing the product.
- Prefrying set the batter /bread coating on the fish portion.
- frying develops a characteristic crust and gives the product a fried oily appearance and taste
- frying temperature is between 180-200 °C

f) Freezing :

- Fried fish portion for freezing is air cooled.
- allow the batter cooking to recover from the frying shock

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- Freezing is performed through spiral freezer and completed when external temperature of the product is around -10°C .
 - **g) Packaging & storage :**
 - Packing of coated seafood should be done in thermoformed containers.
 - usually stored at -10°C or lower.



- **Coated foods :**

- There are five general categories of coated seafood products like
 - Precooked, Raw breaded, Battered (for fryer finishing), Battered (for oven finishing) and Sauced.
 - A variety of battered and breaded products can be prepared from shrimp, squid, clams, fish fillets, minced meat from low cost fish etc.
 - battered and breaded snack product named ‘Oyster pablano pepper fritter’ prepared from edible oyster (*Crassostrea madrasensis*).

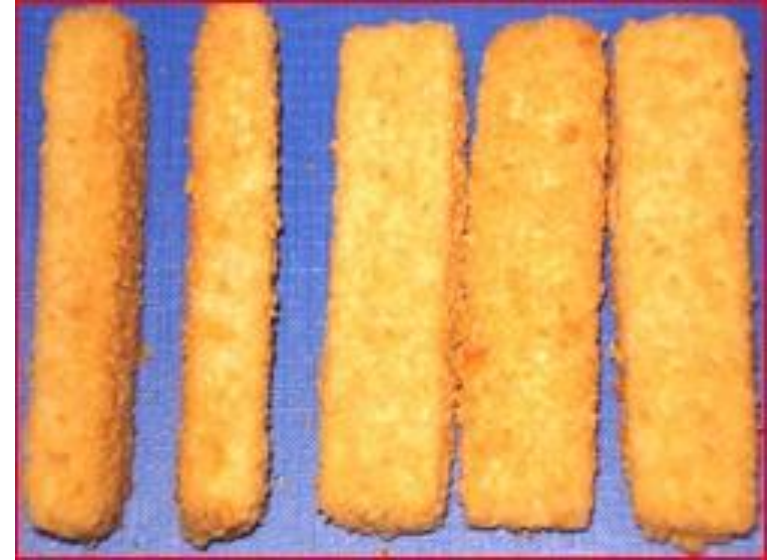
• FISH MINCE BASED PRODUCTS :

• **Fish finger:**

- also be prepared from
- the skinless and bone less fish
- mince.

Forming machines are

- used for reshaping large
- sections of mince blocks
- slabs are cut into thin finger, battered and breaded & then flash fried.





- **Ingredients :**

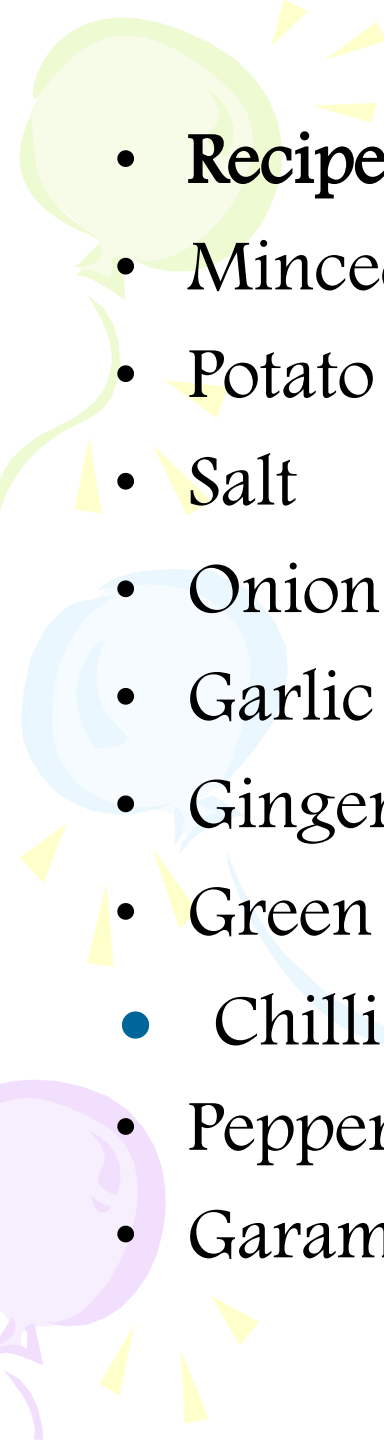
- Fish meat/fillet, salt, onion, garlic, ginger, green chilly, chilly powder, pepper, cumin powder, coriander powder, besan, bread crumb, baking powder, refined oil.

- **Method :**

- Washing fish → dressing (fillet) → fillets shaped into fingers → mixing with salt → frying ginger, garlic, onion, gr. Chilly paste in oil → slurry of besan with water → adding fried paste to slurry → salt & other spices → mixing → dipping finger in batter → rolling over bread crumb → deep fry in oil.

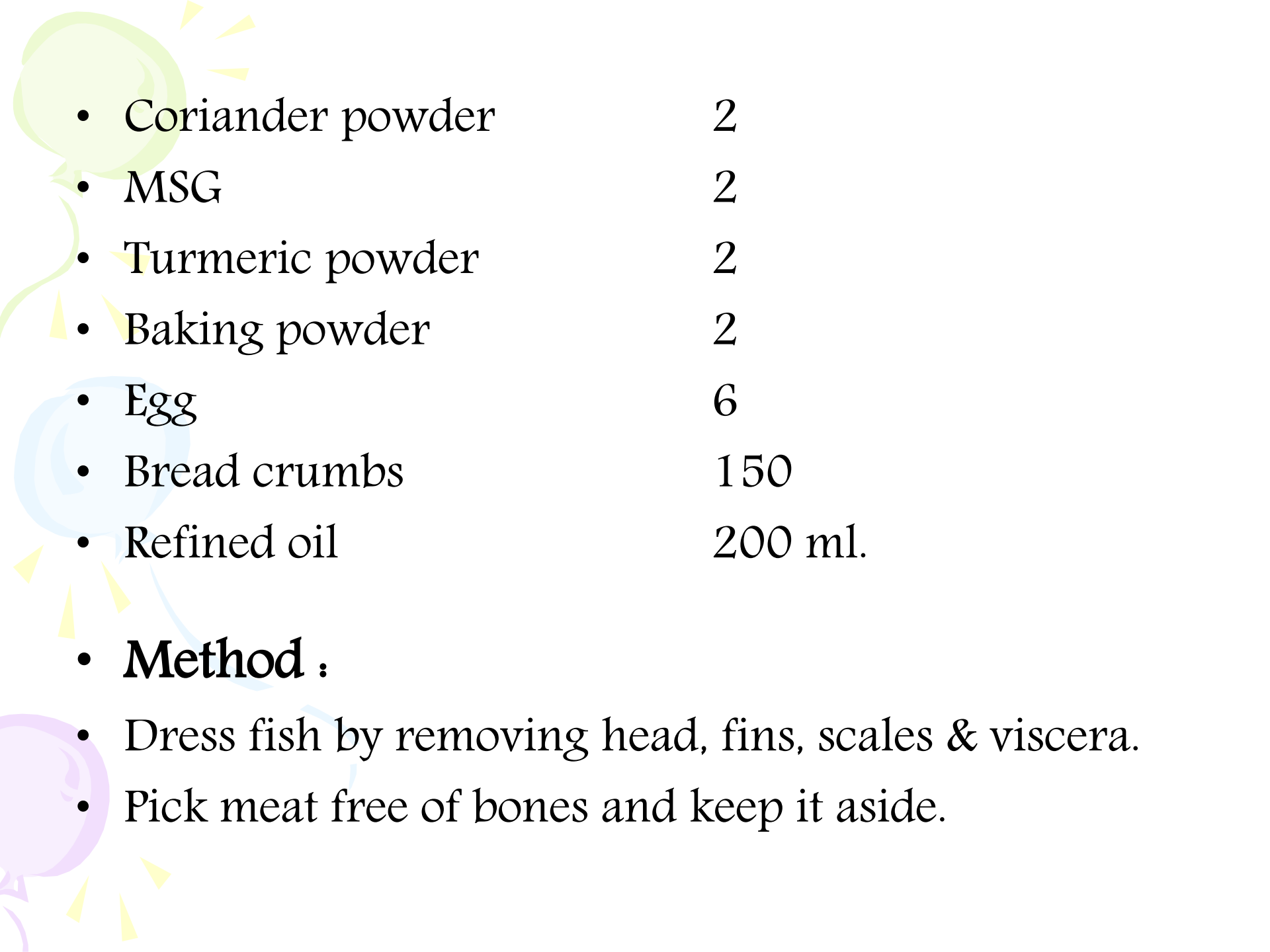
- Can be prepared by cutting frozen mince meat into finger shape.
- **Fish Cutlet:**
 - Mince starch based,
 - spiced & deep fried
 - product.
 - prepared using cooked
 - fish mince which is mixed with cooked
 - potato, fried onion and spices.
 - formed into square shape weighing about 40 gm
 - formed cutlets are battered, breaded and flash fried.





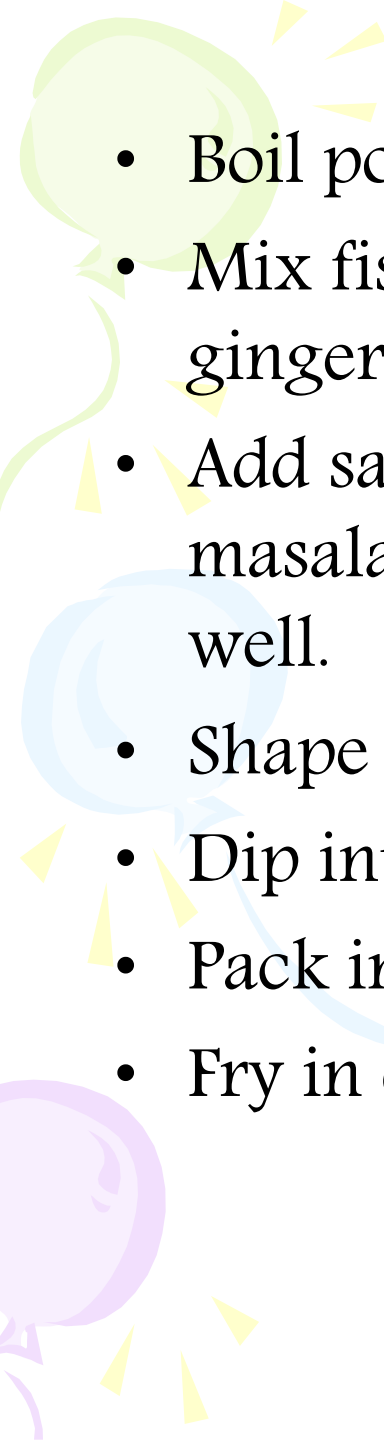
- **Recipe of fish cutlet :**

- Minced fish meat 1000
- Potato (cooked & peeled) 250
- Salt 25
- Onion (peeled) 150
- Garlic 15
- Ginger 15
- Green chilli 10
- Chilli powder 5
- Pepper 5
- Garam masala 5

- 
- Coriander powder 2
 - MSG 2
 - Turmeric powder 2
 - Baking powder 2
 - Egg 6
 - Bread crumbs 150
 - Refined oil 200 ml.

- **Method :**

- Dress fish by removing head, fins, scales & viscera.
- Pick meat free of bones and keep it aside.

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- Boil potato for 15 min, cool, peel & mash into paste.
 - Mix fish meat with smashed potato, onion, garlic , ginger & green chilli paste thoroughly.
 - Add salt, chilli, turmeric , pepper powder, garam masala, coriander powder, MSG, baking soda & mix well.
 - Shape about 25 grams into oval /round shape.
 - Dip into egg white, roll over bread crumbs.
 - Pack in polythene packs, store in deep freezer.
 - Fry in oil before use & serve hot with sauce