Primary processing Knowledge Organiser

Food processing

Food processing is any deliberate change in a food that happens before it is available for us to eat; almost all food is processed in some way.

Commercially, the main reasons to process food are to eliminate microorganisms (which may cause disease) and to extend shelf life. Food production and processing ensures that food is edible and safe to eat.

Foods are processed for a number of reasons:

- to extend the shelf life, e.g. making strawberries into jam;
- convenience, e.g. frozen ready meals;
- health, e.g. reduced fat yogurt;
- to provide consumers with more variety and choice;
- to provide additional nutritional benefits, e.g. fortified breakfast cereals.

Milk

- cows are reared by farmers
- they are milked twice a day
- raw milk is heat treated e.g. pasteurised (primary) to make it safe to drink and filled into bottles or cartons
- milk can be secondary processed to make cheese or butter for example.

Wheat:

- wheat is grown and harvested by farmers
- grains are extracted from wheat and is milled into flour (primary)
- flour can be secondary processed to make bread and pasta.

Fruit juice:

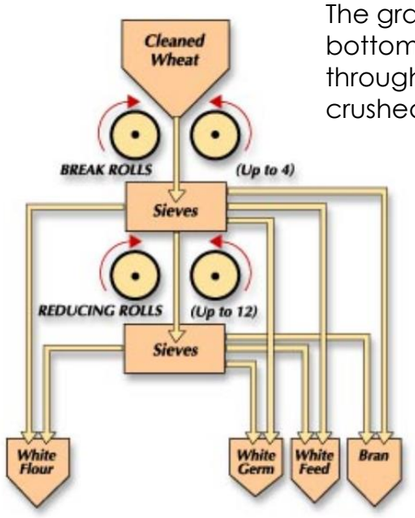
- farmers grow fruit such as apples and oranges (primary)
- fruit is harvested and washed
- fruit is squeezed to get juice
- juice is sold in cartons.

pasteurised	Milk is heated to 75°C for 25 seconds then cooled to 5°C quickly. This destroys most bacteria. Post-pasteurisation, the milk is safe to drink.	All fresh milk must be stored in the fridge at 5°C. Avoid direct sunlight. Avoid storing old and new milk together.
homogenised	The milk is pressed through a fine mesh to separate the fat into smaller molecules so it is distributed evenly through the mixture. Consistency is the same throughout the milk & texture is creamy.	
sterilised	Milk is heated to 50°C then homogenised. Milk is then bottled and heated to 110°C for 30 minutes. Will last in sealed containers for 6 months without the need for refrigeration. Sterilisation can affect the taste and texture of the milk.	Used for cakes, drinking, smoothies, custard, sauces, rice pudding.
ultra-heat treatment (UHT)	Milk is heated to 135°C for one second. Heat kills bacteria. Packaged into containers. Can be stored, unopened, for 6 months.	

Primary processing of wheat into

After washing wheat grains are placed in the hopper.

Grain passes through series of steel rollers set close together which rotate at different speeds.



The grains drop through hole in bottom of hopper and pass through rollers where they are crushed.

Flour is sieved to remove the outside layers – the bran

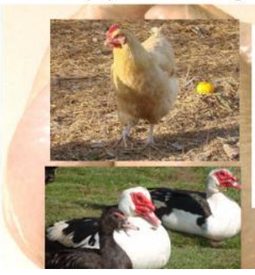
White flour is sieved to remove the outside layers – the bran.
72% of grain left mostly endosperm

Wholemeal or wholewheat flour	100% of the whole grain The whole wheat grain- bran, endosperm and germ are milled. NOTHING is removed.
Brown flour	85% extraction. Some of the bran and germ are removed.
White flour	72% extraction. All the bran and germ are removed.

Food Provenance – **Processing and production**

Primary processing.	Secondary processing
Plant foods (fruits + vegetables) -sorted into different sizes -trimmed of leaves / stalks -washed -damaged are discarded -wrapped in packaging -identification stickers -stored	Whole peaches turned into canned peach slices in fruit juice. Oranges turned into orange juice or marmalade Vegetables peeled and chopped and turned into soup. Beans / lentils cooked , mixed with other ingredients and turned into burgers.
Animal foods (meat+ poultry after slaughter) -Blood drained out -Skin, feathers removed -Internal organs (liver, kidney) removed -Carcase is hung -Meat carcase cut into separate joints -Poultry is trimmed and trussed	Beef turned into minced beef then into burgers. Chicken meat turned into nuggets or goujons Fish filleted and turned into fish cakes / fish fingers

Primary processing – **poultry**



Chickens
Turkeys
Ducks
Pheasant
Geese

The blood drains away

Head and feet are usually removed

Feathers and internal organs are removed.

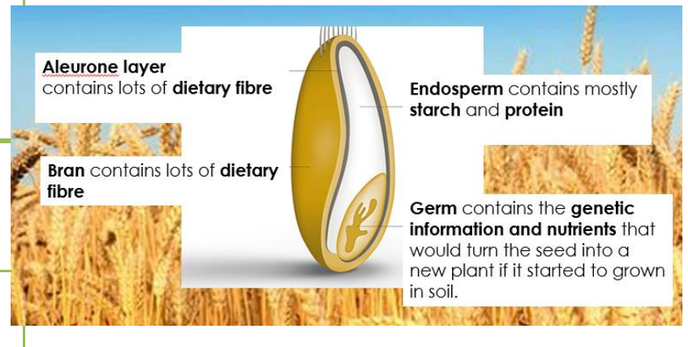
The carcass is **trussed** , which means legs and wings are tied neatly together ready for sale

Primary processing – **meat**

Meat carcases are **hung for a few hours** at 1°C

Hanging the meat allows the natural enzymes in it enough time to start to tenderise the protein and develop its particular flavour.

Hanging meat develops its flavour and texture.



Secondary Processing Knowledge organiser

Processing Yoghurt	**milk is homogenised**	To remove bacteria and even out the texture of the milk.
	starter culture	Added to the milk to encourage the milk to ferment.
	lactic acid	Is produced as the bacteria and fermentation process continues.
	coagulation	As the milk ferments, it begins to set into 'natural' yoghurt.
	flavours added	Sugars, sweeteners, fruits, flavourings are added.
	packaged	Ready for distribution and chilled.

Processing Jam	
Select suitable fruit	Select under ripe fruit because it contains more
Wash Fruit	Remove all insects and dust
Prepare the fruit	Remove bruised fruit, storks and stones
Grease the persevering pan	This prevents scum from forming later
Add water and acid	Fruit will simmer until tender and release pectin from the fruit with help from fruit acid. Lemon juice can be added at this point if fruit is low on acid.
Add sugar	A high concentration of sugar will prevent microorganisms from boiling the jam
Add pectin	Add liquid pectin if fruit is low in natural pectin to help thicken and form 3D network
Bring to boil	Stir to avoid burning
Test the set	Setting point 105 deg.C use wrinkle test
Pour into jars	Fill sterilised jar

Processing Cheese	**milk is pasteurised**	To remove pathogenic bacteria.	
	starter culture added	Specific bacteria are added to ripen the milk and begin fermentation.	
	rennet is added	Lactic acid is produced during fermenting – rennet is added to help coagulate the mixture.	A non-animal based enzyme (to allow cheese to be kept vegetarian).
	whey is drained	Separating the curds from the whey.	
	cheese is pressed	Curds are heat-treated and pressed to remove more whey.	The more whey removed, the harder the cheese.
	cut into blocks	Cheese is cut into blocks, ready to be left to mature for up to 2 years.	The longer it is left, the stronger the flavour.

Bread Making Procedure	mixing	• sieved flour adds air, which helps bread rise in the oven • body temperature water awakens the yeast to begin fermenting
	kneading	• yeast wakes up and starts to ferment • flour proteins begin to form gluten • gluten provides bread with structure
	proving	• starch in flour is broken down and fermented by yeast • carbon dioxide is produced, making the gluten expand and rising the dough
	knock back	• carbon dioxide bubbles are 'knocked back' by kneading again • texture is improved and bread rises even more
	shaping	• bread is formed into its desired shape • the gluten holds the shape
	proving	• second prove allows the carbon dioxide and yeast to ferment, improving the rise of the dough
	baking	• yeast rises at first until it is killed off by the heat of the dough increasing • gluten is stretched as the carbon dioxide expands • as the mix coagulates, it forms a strong structure • dextrin is formed on the outer parts, creating brown crust