GRINDS360

HOME ECONOMICS

REVISION NOTES FOR HOME PRESERVATION

SANDRA CLEARY

1. FREEZING

- **METHOD FOR FREEZING VEGETABLES (PEAS)**

→ Turn the freezer down to -25°C a couple of hours before freezing (more than 1/10th capacity of freezer with fresh food).

→ Prepare fresh peas as for cooking i.e. remove peas from pods and rinse in a colander under cold running water.

→ BLANCH PEAS - Bring a large saucepan of water to the boil, place 500g of peas in a wire basket, plunge the basket of peas in the boiling water for 1 minute. After blanching, plunge the peas into ice cold water to refresh (i.e. keep the bright green colour and stop the cooking process).

→ Shake off excess water and pack the blanched peas into a polythene freezer bag. Remove the air and leave head space before tying the bag with a wire tie.

→ Using a freezer pen/crayon, LABEL the peas.

Name: garden peas Date: 1 June/2025. Weight: 500g

→ Freeze @ -25°C, once frozen reduce freezer to -18°C.

- **METHOD FOR FREEZING FRUIT (Strawberries)**

LOOSE FROZEN STRAWBERRIES

→ Turn the freezer down to -25°C a couple of hours before freezing strawberries (if freezing more than 1/10th capacity of the freezer with fresh food).

→ Prepare strawberries for eating ie. remove the hulls (green leafy parts), place the whole strawberries in a colander, wash them under cold running water.

→ Spread the strawberries out on a wire tray with the pointed end of the strawberries facing upwards. Leave space (approx 2cm) between each strawberry. Place the tray of strawberries in the freezer and OPEN FREEZE until they are solid (4-5 hours).

→ Take the frozen strawberries out of the freezer, pack into polythene freezer bags, remove air and seal the polythene freezer bag with a freezer tie.

→ Using a freezer pen/freezer crayon write:

Name: STRAWBERRIES Date: 01 July 2025. Weight:

→ Return the strawberries to the freezer and reduce the freezer temperature back to -18°C.

Underlying Principle of Home Freezing

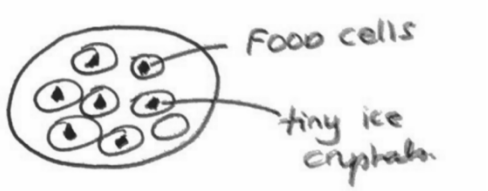
- The underlying principle of all methods of preservation is to remove one or more of the conditions necessary for microbial growth.
    - food
    - warmth
    - moisture
    - correct pH
    - correct oxygen level.

1. REMOVAL OF MOISTURE

- All micro-organisms need water in a liquid form, they cannot utilise ice. Freezing stops the growth of microbes by halting their metabolic activity, meaning the microbes become dormant and cannot cause food spoilage. However, these microbes can become active again when the ice thaws and water becomes available again.

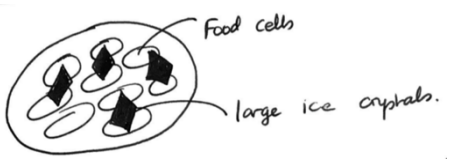
2. LOW TEMPERATURES RETARDS FOOD SPOILAGE

(A) Quick Freezing @ -25°C inactivates microbial activity. Tiny ice crystals form within food cells at this temperature.
(Once this frozen food thaws, returns to room temperature, ice melts, no structural damage to cells, no leaching of nutrients in drip loss.)



(B) SLOWER FREEZING -18°C - inactivates microbial activity however enzymes in lipid foods (bacon, rashers, oily fish) may still be active and result in hydrolytic rancidity.

- freezing @ -18°C also results in LARGER ICE CRYSTALS



once food thaws, cells are damaged/ruptured resulting in soggy food with loss of texture and valuable nutrients can leach into 'drip loss'

3. BLANCHING

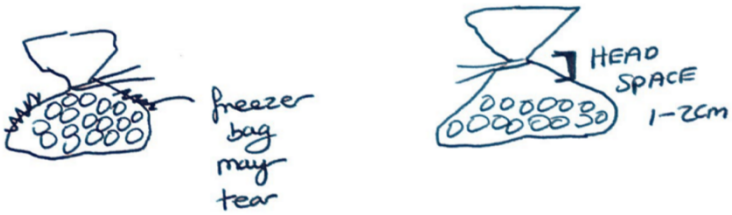
- Vegetables contain plant enzymes including lipoxidase, catalase (potatoes), alliinase (onions), (peas)
- Freezing slows down but does not destroy enzymes in fruit and vegetables, therefore vegetables are usually blanched before freezing.
- Blanching involves plunging prepared vegetables into boiling water for a short time eg. peas blanched for 1 minute, this denatures/inactivates enzymes.

- after blanching, vegetables are refreshed in ice cold water to retain bright colour of fresh vegetables and stop the cooking process.
- By denaturing enzymes during blanching, enzymes cannot cause spoilage in the freezer.

RISK OF SPOILAGE IN HOME FREEZING

1. FREEZER BURN

- When packing food into freezer bags (polythene), always allow head space ie. 1–2cm gap between the top of the food and the wire tie.
- This allows for expansion of food during freezing as water converts to ice.
- Without head space, the food could expand and tear the freezer bag or rough handling of food wrapped in tin foil can tear, the food is directly exposed to ice, resulting in FREEZER BURN.
- freezer burn causes toughening and discolouration of food.



2. FREEZING SLOWLY

- If food is frozen @ -18°C instead of -25°C, large ice crystals may form.
- Once the food thaws, the structural damage done to the food cells as a result of large ice crystals becomes obvious as the quality of texture of the food is reduced (food is soggy) and valuable nutrients may leach out of the ruptured cells.

2. JAM MAKING

- **METHOD OF MAKING JAM (using fruit)**

→ Equal quantities of fruit and sugar (1:1) are placed in a heavy based saucepan.

→ Sugar is dissolved over a gentle heat (to avoid crystallisation). Once sugar is dissolved, the fruit and sugar mixture is brought to the boil. It is stirred regularly.

→ Once **104°C** is reached on the sugar thermometer, the **setting point of jam is reached**, the hot jam is cooled slightly.

→ The hot jam is poured into preheated, sterilised glass jars.

→ **Wax discs** (waxed side facing onto hot jam) are placed on the surface of the **HOT jam**.

→ Once totally cooled, the jars are sealed with tight fitting lids.

→ The jars are labelled with

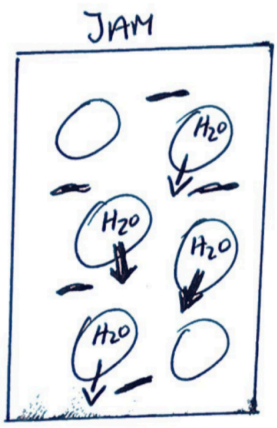
Name of Jam: Date made:

→ They are stored in a cool, dark, dry well ventilated press for up to 1 year.

Underlying principle of Home Jam Making

- The underlying principle of all methods of preservation is to remove one or more of the conditions necessary for microbial growth.
  - food
  - warmth
  - moisture
  - correct pH
  - correct oxygen level.

1. Removal of Water by Osmosis



O = FRUIT (high ↑H_2O)
— = Sugar (sucrose) (low ↓H_2O)

OSMOSIS is defined as the movement of water molecules (H_2O) from an area of high concentration to an area of low concentration across a semi-permeable membrane.

- In jam, water moves out of the fruit cells where it is in high concentration across a semi-permeable membrane to where sugar is present (0-01% water in sucrose).
- **Result**: Little or no water available in fruit cells for microbial activity therefore reducing risk of spoilage.

2. High Temperature destroys Microbes

- Jam is boiled @ 104°C, this kills all yeast spores, mould spores and other microbes that could cause spoilage in jam during storage.
- Also, this high temperature will denature enzymes in fruit which inactivates them and prevents enzymatic spoilage in jam.

3. PECTIN

- Pectin is a NSP (non starch polysaccharide) present in ripe fruit. It is present in high amounts in apples, lemons, blackcurrants raspberries have a medium amount, strawberries have a low amount.
- Lemon juice (acid) 15ml lemon juice added to 1kg fruit with low pectin can draw out pectin from the fruit cells.
- PECTIN acts as a gelling agent and helps jam to thicken enhancing the texture and stability of jam.

Risk of Spoilage in Jam Making

1. YEAST FERMENTATION

- If less than the minimum 65% sugar concentration required in jam making is not provided, yeast cells can cause fermentation to occur on the surface of jam spoiling it.

Jam
1kg fruit = 1 kg sugar
1kg fruit = 650g sugar (Minimum).

2. WAX DISCS on HOT Jam.

- If wax discs (waxed side) is not placed on **HOT** jam, the wax will not melt and form a seal on the surface of the jam therefore exposing the surface of jam to mould spores and mould growth.