Microwave ovens provide a convenient method of cooking and reheating food. Their ease of operation and time-saving properties mean that their popularity is likely to increase for domestic use as well as in restaurants and institutions.

While few people would dispute their convenience, consumers are sometimes concerned about the safety of microwaves and their effect on nutrients in food.

**Identified Risks and Hazards**

Hazards that may be encountered in food activities involving ovens include:

- burns from steam, hot liquids, microwaved foods
- fire from fats, oils, paper, fabric, electrical faults
- spills from fats, oils, liquids, food
- explosion from the combustion of steam

**Effect on food**

All food undergoes changes when heated; there is no solid evidence that microwaves cause any effect on food other than those due to rapid heating. Care should be taken to avoid overcooking.

**Radiation and food**

Food cooked in a microwave oven does not present a radiation risk. Microwaves cease to exist as soon as the power to the magnetron of a microwave oven is switched off. They do not remain in the food and are incapable of making either it or the oven radioactive. Microwave ovens are less likely to cause burns than are conventional ovens.

**Pre-Operational Safety**

The following safety checks and precautions should be carried out when preparing to set up and use ovens and/or hotplates in the food technology area:

- Electrical equipment must be isolated from the main electricity supply when not in use.
- The operator should seek permission from the teacher before using equipment.
- Always check that the equipment is in good working.
- Check all adjustments and settings carefully before commencing any cooking operation.
• The work area should be clean and free of equipment, rubbish and other obstacles.
• Ensure you have had instruction and training in the use the equipment and satisfactorily completed the relevant OHS test.

Operating Safety Precautions

• Do not use a microwave without food in it for any reason.
• Do not put metal/aluminium foil or plates with metal edging such as gold, in the microwave.
• Care should be taken that frozen food has been completely thawed.
• Care should be taken to avoid overcooking.
• Do not put eggs in the shell in the microwave. They will explode.
• Do not open the door of the microwave until the beeper sounds.
• Always use oven mitts to remove the hot food products.
• Food cooked in a microwave oven does not present a radiation risk.
• Microwave ovens are less likely to cause burns than are conventional ovens.
• Burns have occurred from the steam emitted from microwaveable popcorn bags and similar closed packages and from the boiling portions of foods which heat unevenly.
• When using new crockery for the first time in a microwave oven, use oven gloves to remove the item after heating
• It is very important that food containers which have been designed to package frozen or chilled foods such as ice cream or margarine, are not exposed to high temperatures in a microwave oven.

Microwave ovens and burns

Microwave ovens are less likely to cause burns than are conventional ovens. However the potential hazard of burns associated with microwave cooking is not often considered, and many people allow young children to operate these appliances unsupervised. Burns have occurred from the steam emitted from microwaveable popcorn bags and similar closed packages and from the boiling portions of foods which heat unevenly.

An example of this is a jam-filled donut; the jam centre may exceed the boiling point of water while the donut itself is only warm. Frozen macaroni cheese is another example as the cheese reaches a high temperature more quickly and retains more heat than the macaroni.

Severe scalding has also occurred when babies have been given milk heated in a microwave oven.
Personal Safety

- Wear PPE to protect your hands from burns, such as oven mitts.
- Do not wear loose clothing, especially long sleeves and neck ties.
- Tie long hair back or wear PPE such as chefs hat or cap.

- Wear a cotton apron and enclosed shoes with solid firm uppers and non-slip soles.
- Do not run in the Food Technology area and keep noise levels to a minimum.
- Stay in the designated work bay.

Maintenance

Microwave Radiation and Leakage
Microwave oven doors are designed with at least two features which ensure that power is cut off immediately the door is opened. However it is possible for microwaves to leak out around the edges of a badly fitting or damaged door.

If a door does not fit squarely and operate smoothly or if it shows signs of corrosion or damage, the oven should be inspected by a qualified technician.

Operating Procedures and Precautions

- Food cooked in a microwave oven does not heat uniformly and unwanted micro-organisms may survive in portions of poorly heated food.
- Care should be taken that frozen food has been completely thawed.
- A positive feature of microwave ovens with regard to food safety is that food can be taken from the freezer, thawed quickly, cooked and served without it spending long periods of time in favourable conditions for the growth of dangerous micro-organisms.
- When using new crockery for the first time in a microwave oven, use oven gloves to remove the item after heating, until you are aware of its heating characteristics. There have been instances when some types of crockery mugs have absorbed more heat than the liquid they contained causing unexpected burns.

Containers and films for microwave cooking

Only utensils designed for the purpose should be used in a microwave oven. However as there are no standards currently available for claims such as ‘microwave-safe,’ any concerns about the safety of such products should be referred to the manufacturer.
It is very important that food containers which have been designed to package frozen or chilled foods such as ice cream or margarine, are not exposed to high temperatures in a microwave oven. The low melt temperatures of these plastics may result in migration of undesirable contaminants into the food or in physical disintegration of the containers themselves.