SECTION

3

METHODS OF COOKING

HOW TO STUDY THIS SECTION

This section discusses four aspects :

i) pre-preparation of food

ii) cooking methods

iii) influence of pre-preparation and cooking methods on nutritive value of foods and

iv) useful tips on achieving best results in pre-preparing and cooking food.

You will find the information organized in the form of check-lists, tables and charts so that you can quickly and easily grasp the major points.

Do remember that you can ensure maximum nutrient retention by choosing the right methods to pre-prepare and cook foods.

So, let's cook right and eat right !

SKILLS TO LEARN FROM THIS SECTION

- Choosing the best method of cooking for a particular food ;
- Selecting appropriate cooking times and techniques for particular dishes ;
- Identifying ways to minimize nutrient losses while ensuring well-cooked food.

Structure

3.0 INTRODUCTION

Savita is preparing idlis. She first soaks rice and urad dal (black gram) separately overnight. The next morning she grinds them separately, mixes the ground rice and dal and keeps it aside to ferment. And last of all she pours the fermented batter into idli moulds and steams it. The most spongy and soft idlis are ready !

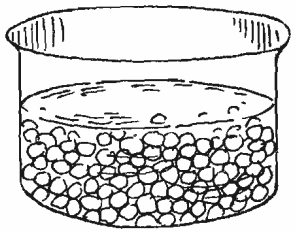
Can you list the processes involved from start to finish ? Yes, of course. They are :

- Soaking
- Grinding
- Mixing
- Fermenting
- Steaming

Now which are pre-preparation methods and which cooking methods ? Soaking, grinding, mixing and fermenting are done prior to cooking. They are hence examples of pre-preparation methods. Steaming is, of course, a cooking method.

Let us talk about these and other pre-preparation and cooking methods in the following subsections.

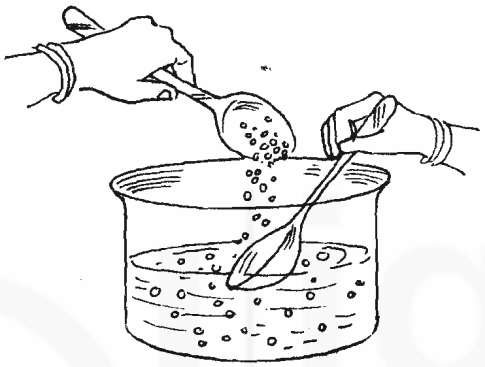
CUTTING



SOAKING

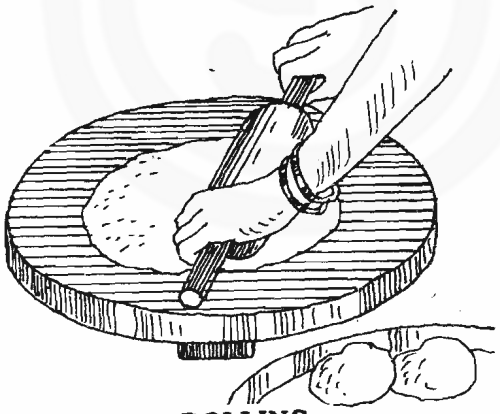
GRINDING

POUNDING

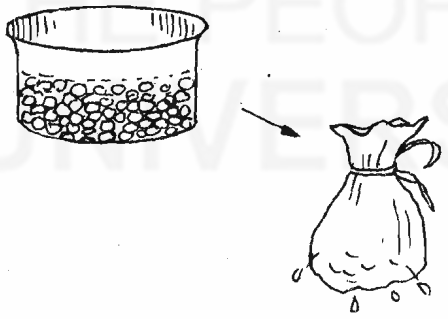


MIXING

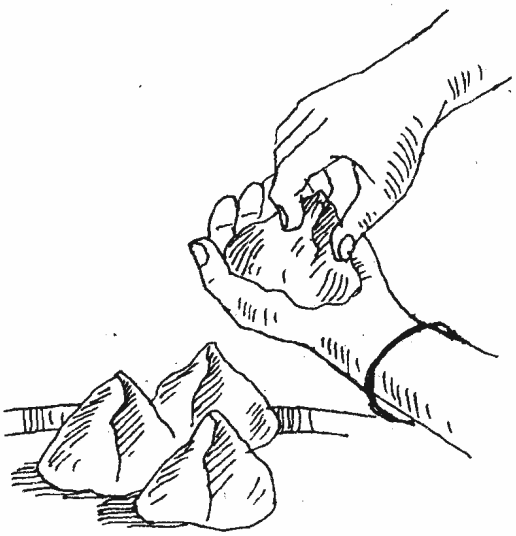
PEELING



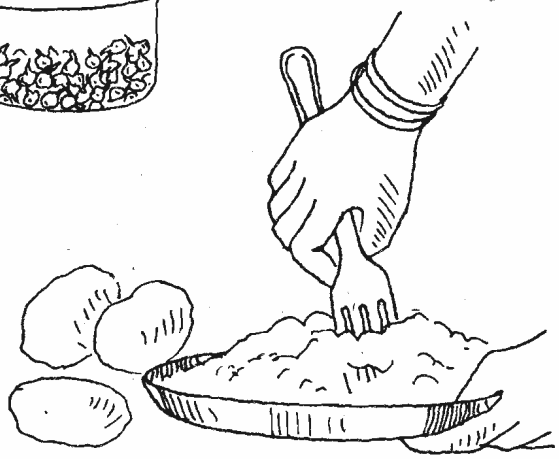
ROLLING



SPROUTING



MOULDING



MASHING

3.1 CHECKING OUT THE PRE-PREPARATION METHODS

India is a land of rich diversity. Cooking is just one expression of this diversity. We prepare a host of delicious dishes each typical of a particular region and its people. But if we think for a moment about the processes we carry out before cooking we can prepare a list like this :

i) Peeling
ii) Cutting (including slicing, chopping, dicing)
iii) Grating
iv) Pounding
v) Grinding
vi) Soaking
vii) Sprouting
viii) Fermenting
ix) Mixing (including kneading)
x) Mashing
xi) Rolling
xii) Moulding

If you think a little you might be able to add some more. Further, you might have noticed that each region has its own typical equipment for these procedures. It is amazing, isn't it ? From the rolling stones and rolling pins typical of the north to the paddle-like mixers in the South. From grinding stones to the mortar and pestle used for pounding ! We also have the typical moulds which give us so many interesting designs for fried savoury snacks such as chakli, murukku and steamed preparations such as idiappam.

One question that you might like to ask could be—how do these methods influence cooking ? Very often particular pre-preparation methods are necessary for making a particular dish. We cannot make poories without kneading the dough and rolling it out before frying. Similarly, we cannot make chutneys without grinding and mixing. In fact these pre-preparation procedures make it easier to use a particular cooking method.

Another major influence is the role of pre-preparation in making cooking faster. What would happen if we do not cut and chop foods before cooking ? The finer we cut, the faster the cooking. Ground foods cook very rapidly indeed. But there are disadvantages too as the following chart will show you.

Pre-preparation method	Extent of nutrient losses
Peeling	Thin peels, less loss
Cutting	Thinner and smaller pieces, more loss
Grating	Finer pieces, more loss
Grinding	Finer particles, more loss
Soaking	Longer time and more water, more loss

You already know that certain vitamins are very susceptible to destruction when exposed to air such as vitamin C. So procedures like *peeling, cutting, grating and grinding all influence vitamin C content in particular because the foodstuff is exposed to air.* Other nutrients are generally not influenced. In peeling, of course, a part of the food is discarded. The nutrients present in the discarded portion would, therefore, also be lost.

Soaking is a procedure that can greatly influence nutrient content. *The longer we soak a food item the more the water-soluble vitamins and minerals leach (move) out*

necessary. Nutrient losses due to soaking can be minimized if we use the same water for subsequent cooking. For example if we soak rice and then cook it in the same water nutrients would be conserved rather. than wasted. Now, that's easy to do, isn't it ?

Processes like pounding and mixing do not lower nutrient content to any significant extent.

As you learnt earlier in Block 2 there are pre-preparation procedures that add nutrients to food. These procedures are sprouting and fermenting.

Pre-preparation process	Nutrient added
Sprouting	Vitamin C, B vitamins
Fermentation	B vitamins

You are probably familiar with several sprouted foods such as sprouted pulses and cereal grains and fermented foods such as the mixtures used for making bread, bhatura, idli, dosa, dhokla. In fact curd is also a fermented food.

ACTIVITY 1

a) Which pre-preparation procedures do you use at home ?

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b) On the basis of what you have learnt would you try to change some of the practices you adopt ?

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c) Do you include sprouted or fermented foods in your diet ? Describe one sprouted and one fermented dish commonly consumed in your region.

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3.2 WHAT'S COOKING ?

Food and cooking are central themes in any culture. We know that food is often an expression of our identity. But have you ever wondered or asked yourself the question — why do we cook ? You might come up with answers like :

- To make food more palatable and tasty
- To help chewing
- To make food look attractive and improve the appetite
- To introduce variety.

These are in fact the reasons we think of on the basis of our experience and common sense. In addition to these there are certain specific advantages of cooking food :

i) Cooking makes food easy to digest

ii) Cooking destroys harmful micro-organisms like bacteria in food which can cause disease.

Cooking methods generally use heat to bring about the desired results. So heat is a common feature as you see in the following chart which describes the main types of cooking methods.

	Moist Heat	**Dry Heat**	**Dry Heat (Heated Fat or Oil as Medium)**
Description	Methods using hot water or steam to cook a food	Methods using hot air or direct contact of food with a hot surface	Methods using hot fat or oil to cook foods
Examples	Boiling Simmering Blanching Steaming Pressure Cooking Poaching Stewing	Roasting Grilling and Toasting Baking	Sauteing Frying

You may be familiar with most of these cooking methods. But you may find a few terms unfamiliar. Read through the following ready reference if you have any doubts.

1) Boil : To cook in a liquid at the boiling point. The boiling point is the temperature at which the liquid is hot enough to bubble and steam.

2) Simmer : To cook in a liquid at temperatures below the boiling point. Usually liquid is brought to a boil and the flame reduced.

3) Blanch : To partially cook by dipping in boiling water for a few seconds to two minutes. We remove the skin of tomatoes and almonds by blanching.

4) Steam : To cook food inside a metal basket or another holder containing holes over boiling water. We steam idlis, dhokla and idiappam.

5) Pressure Cook : To cook foods by steaming (heating) under high pressure. Increasing pressure increases the temperature at which water boils. This means water will boil at a higher temperature in a pressure cooker.

6) Poach : To cook in hot liquid usually below boiling point taking care to retain shape. We poach eggs in hot water. We can also poach fish, fruits.

7) Stew : To cook in a small amount of liquid in a covered container.

8) Roast : To cook food by placing it in direct contact with the heat source. Fat or oil is smeared on the food at intervals while it is roasted to help even cooking. The heat source may be live coals, an oven or tandoor. Sometimes food items are roasted in a metal karhai e.g. suji, chana dal.

9) Grill : To cook food by placing on a metal grill over the source of heat. When bread is browned over a grill or on live coals the method is called toasting.

10) Bake : To cook using equipment such as an oven or tandoor in which hot air circulates. We bake biscuits, bread, cookies and cakes.

11) Saute : To cook by tossing food in a small amount of fat. Sauteing is often followed by some other method of cooking. We saute onions, tomatoes and other vegetables.

12) Fry : To cook in hot fat. When foods are partially immersed in hot fat, the method is called shallow frying. When foods are completely immersed, the method is called deep frying.

Read this list a couple of times to familiarize yourself with the cooking methods. Next we must try to understand the advantages and disadvantages of various cooking methods.

PLUS POINTS OF COOKING METHODS

- Grilling, frying, pressure cooking help rapid cooking.
- Frying and steaming introduce different textures. So do roasting, grilling and baking.
- Stewing gives a delicate flavour.
- Pressure cooking and steaming conserve nutrients.
- Steaming makes food light and more digestible.

MINUS POINTS OF COOKING METHODS

- Frying and roasting need continuous and careful attention to prevent burning.
- Frying and roasting add a lot of fat and therefore calories.
- Boiling takes time ; so does stewing.
- Frying cuts down on vitamins which are destroyed by heat e.g. vitamin C, vitamin A. So do roasting, grilling and baking.
- Moist heat methods involve loss of water-soluble vitamins particularly if excess water is used and the extra drained off.

It would be of great benefit to us if we could use this information to select the right types of cooking methods for different kinds of food items. The following check list can help.

Description of food items	Example	Suitable cooking methods
I. Tough, difficult-to-cook foods (i.e. foods that take a long time to cook)	Tough meats, including chicken, tougher fibrous vegetables, potatoes, rice	Pressure cooking Boiling, Simmering and Stewing
II. Tender foods	Tender meat or fish, some vegetables	Frying Grilling Baking
III. Other foods	Vegetables, potatoes Bread	Frying (cutlets) Grilling Baking Toasting Grilling

ACTIVITY 2

Here are three dishes one each from Kashmir, Gujarat and Andhra Pradesh (Hyderabad). Underline all terms used in the recipe to indicate pre-preparation or cooking methods. Use a dotted line for pre-preparation methods (. . . . .) and a solid line (_____) for cooking methods as indicated.

DUM GOSHT (Kashmir)

Ingredients : Mutton (meat), poppy seeds, ginger, garlic, almonds, peppercorns (whole pepper), cardamom, cinnamon, cumin seeds, turmeric powder, green papaya, coriander leaves, salt, ghee.

Method : Chop mutton into pieces. Roast poppy seeds and almonds and grind to a paste. Grind ginger and garlic to a paste. Grind cardamom, pepper, papaya and coriander leaves with salt to taste. Wash meat and beat on a grinding stone. Mix ground masala with poppy seed paste, cinnamon sticks, cumin seeds and keep meat pieces covered with this mixture for an hour. Heat ghee in a frying pan, add meat pieces and fry for a few minutes. Add water, simmer gently till cooked.

OSAMAN (Gujarat)

Ingredients: Tur (arhar) dal, jaggery, tamarind, chilli powder, cloves, cinnamon, ginger, green chillies, curry leaves, coriander leaves, mustard seeds, cumin seeds, salt, oil.

Method: Pressure cook the dal with water and turmeric powder. Drain off the water from the dal into another vessel. Add salt, jaggery to taste and tamarind juice to the water drained off from the dal. Allow to simmer on a low fire for a few minutes. Add green chillies and chopped ginger. Heat a little oil, add cloves, cinnamon and curry leaves. Fry well and temper curry with this. Add chopped coriander leaves and serve hot.

SHIKAMPURI KABAB (Hyderabad, Andhra Pradesh)

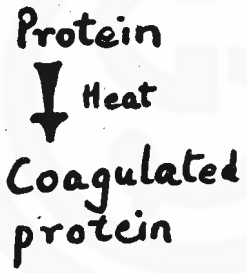
Ingredients: Minced meat, bengal gram dal, cumin seeds, garam masala powder, chilli powder, ginger, egg, a lime, salt, ghee.

Method: Cook the minced meat with spices by simmering. Beat egg. Add half the quantity of beaten egg and lime juice to minced meat and grind to a fine paste.

Chop the rest of the ingredients for the filling, mix together with cooked dal and keep aside. Divide the meat mixture into even sized portions. Shape each portion into a flat kabab. Place a little of the filling in the centre of each kabab and seal well on all sides. Heat a tawa and fry well on both sides, using ghee, until golden brown in colour. Serve hot with mint chutney, slices of fresh lime and onion.

3.3 NUTRIENTS: STILL THERE OR ALL GONE?

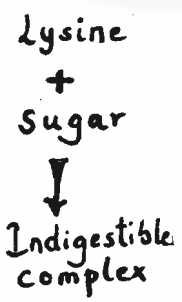
Cooking influences the nutrients in foods. The method of cooking and the degree of cooking can decide whether nutrients are conserved or destroyed.



Let us take a quick look at what cooking does to proteins, carbohydrates, fats, vitamins and minerals.

Influence of cooking on proteins

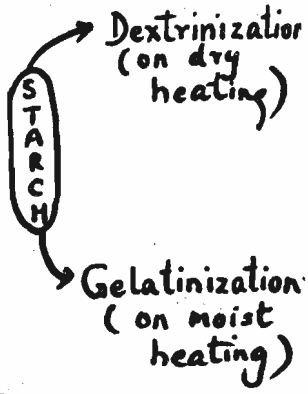
Proteins harden and solidify or *coagulate* on cooking. Have you noticed the changes when frying an egg? The liquid sets on heating and becomes solid. This is the process of coagulation. However, milk protein is an exception. Unlike other proteins it does not coagulate. It is important to cook proteins to the right extent because *proteins shrink and harden on overcooking.* This also renders them indigestible.



Excessive heating of foodstuffs also affects the nutritive value of proteins. Sugars like glucose and lactose form complexes with amino acids like lysine. These complexes cannot be broken down by the protein-digesting enzymes. The result, of course, is that these amino acids are no longer available to the body.

Some pulses like soyabean and bengal gram contain certain substances which hinder the digestion of the proteins of these foods by the enzyme trypsin present in our intestines. During cooking these *trypsin inhibitors* are destroyed. This is why it becomes important not to consume these foods raw. In fact, the digestibility of protein in several foods improves as a result of moderate heating as in day-to-day cooking.

Influence of cooking on carbohydrates



On cooking, the starch granules in foods swell as they absorb water. This process is called gelatinization and is in fact the reason for the thickening of soups, curries, stews to which maida (refined flour) paste is added. *Gelatinization* takes place in all starch-containing foods such as potatoes on heating in the presence of moisture. Dry heat causes the starches to break down into smaller molecules called *dextrins.* This happens, for example, in the toasting of bread or making of chapatis or rotis. Dextrins have a mildly sweet flavour.

Sugar behaves quite differently. As you heat table sugar it forms a syrup with water. On further cooking the syrup thickens and changes colour. This is due to a process called *caramelization.* The brown, thick liquid formed is called caramel and is used in a number of preparations such as custard, cakes. Ordinary cooking causes little loss of carbohydrates.

Influence of cooking on fats

As in the case of carbohydrates our usual cooking practices do not influence fats to any great extent. They are easily available to the body.

What change do you notice when you heat a fat or oil? The temperature rises uptil a point when the fat or oil appears to 'smoke'. This temperature is, in fact, called the smoking point and varies from one fat/oil to another. You should not heat the fat much more than this before putting in the foodstuffs to be fried. Otherwise the fat can catch fire!

However, fats used repeatedly for frying get broken down to form certain harmful substances. The practice of repeated re-heating of fats should therefore be avoided.

Influence of cooking on vitamins and minerals

The water-soluble vitamins and minerals dissolve in the liquid used for soaking and cooking. This is called leaching. If the soaking or cooking water is thrown away there will be considerable losses of vitamin C, B vitamins, sodium, potassium and chloride.

It is therefore important to use the minimum of water or to utilize the liquid used for cooking in soups or curries. Steaming and pressure cooking limit cooking losses due to leaching. Boiling roots and tubers with their skins is the best. This seals in the nutrients.

Vitamin C's enemies
- Heat
- Air (oxygen)

Cutting and peeling influence the extent of losses as you learnt earlier in the subsection on pre-preparation methods. Do you recall the main points? Remember to peel thinly and to cut vegetables in moderate sizes or larger pieces to prevent excessive losses.

We must also mention cooking practices in preparing rice. It is common to wash rice three or four times with large amounts of water. This can sharply decrease the content of B vitamins. Rice of poor quality, of course, requires more washing. Vitamins, particularly thiamine and niacin, can be lost to the extent of 40 per cent. Throwing away the excess cooking water also means throwing away nutrients as you would have realized by now.

Two vitamins — Vitamin C and thiamine – fear the heat with good reason! Both are destroyed on heating. Vitamin C has another enemy — air and the oxygen it contains. The vitamin is easily oxidized on exposure to air and in this oxidized form is of no use to the body. This means we should not peel vegetables or fruits much before use. We should cut them into larger sized pieces.

Thiamine's enemies
- Heat
- Soda

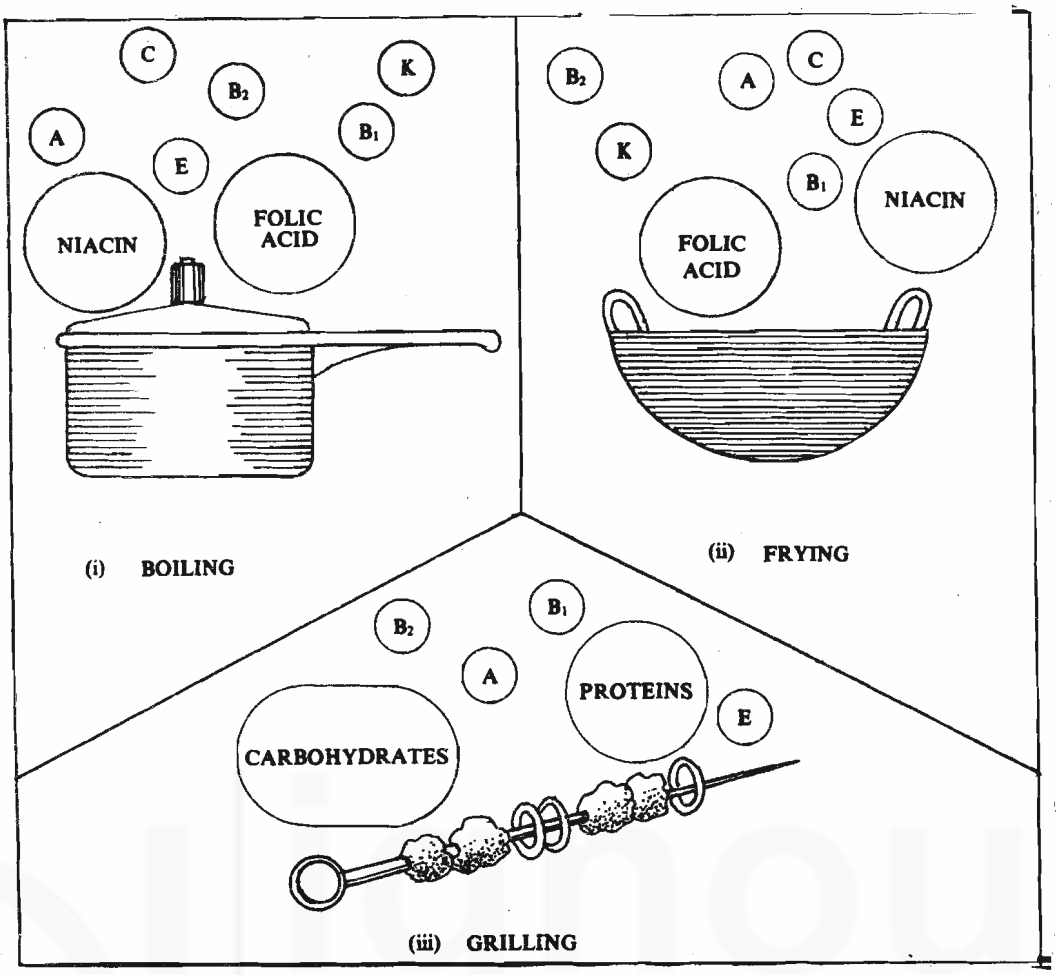
Many of us add sodium bicarbonate (soda bicarb) when cooking pulses. Do you know that soda facilitates cooking but knocks out the thiamine as well? This is absolutely true. Thiamine is easily destroyed in the presence of soda which is alkaline.

On the other hand, an acidic medium (e.g. medium with tamarind, tomatoes) preserves vitamins. Acid is a particular friend of vitamin C.

Fat-soluble vitamins are, however, a class apart. They are not affected to any great extent by cooking in water. But during shallow frying or roasting vitamin A is lost in significant amounts. In deep frying cooking time is short and losses tend to be less.

ACTIVITY 3

The following figures represent different methods of cooking. Shade the circles corresponding to the nutrient or nutrients that you think will be lost to a greater extent for each of the cooking methods. The letters A, C, E, B are of course, referring to the vitamins.



3.4 USEFUL COOKING TIPS

We often ask ourselves questions about the best kind of cooking method and how to get the best results with one particular method. A quick glance at this discussion should help you. Let's begin with boiling.

Boiling

- Pour in just enough water to cover the food. You can replenish the water if too much evaporates.
- Add vegetables to boiling water.
- Cook covered to avoid evaporation and speed up cooking. The lid should be tight fitting!
- Turn down the flame once water boils and allow it to simmer till the food is cooked.

Remember that pressure cooking is far better than boiling. It helps to retain nutrients and is faster too.

Steaming

- Allow water to boil in the double-boiler or steamer before the vessel containing food is placed over it.
- Replenish water in the steamer. Don't allow it to dry out.
- Use a pan with a tight lid.
- Cover the food with greased paper or a greased lid so that the moisture drops that form on it don't drip back onto the food.

Stewing

- Use a tight-fitting lid.
- Use enough water to allow for slow cooking.
- Simmer so as to help slow, steady and prolonged cooking
- Don't overcook!

Baking

- Keep temperature right in oven or tandoor.
- Heat oven slightly more than required before placing the food in it.

- Don't open the oven too often.
- Put in only enough mixture in baking trays and pans to prevent overflow.

Grilling

- Maintain high temperature throughout.
- Grill only tender foods.
- Cut foods into thinner slices.
- Grease the pan (in case of grilling on a pan or tray) or the foodstuff (in case of cooking directly on a flame).

Roasting

- Coat meat pieces with small amount of fat during roasting.
- Turn from one side to another for even cooking.
- Keep on high heat initially and then lower heat slightly to enable proper cooking.
- Stir continuously while roasting grains (cereals, pulses) or spices to prevent burning and uneven cooking.

Pressure cooking

- Keep the capacity of the pressure cooker in mind. Read instructions carefully to see how much your pressure cooker can hold.
- Wait for the first whistle: then turn down the flame.
- Don't overcook! Remember pressure cooking is much faster than boiling.

ACTIVITY 4

1) Prepare your own list of precautions based on what you have learnt so far about the following pre-preparation and cooking methods. We have mentioned two just to give you an idea of how to proceed.

PEELING
PEEL ONLY IF YOU MUST
PEEL THIN

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CUTTING

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WASHING AND SOAKING

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BOILING

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FRYING

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3.5 SUMMING UP

Let's list out the practical points that emerged from this section. We have talked about pre-preparation methods as well as cooking methods. We hope this rhyme will get the message across.

Peel thin
Peel only if you must

Chop bigger.
Slice thicker.
That's the bit that matters!

Pressure cook.
Boil only if you must.
Cooking time matters!

Fry and roast.
Bake, grill and toast.
Temperature matters!

Here are some specific instructions to keep in mind about three of the pre-preparation methods.

A) **Peeling**
- Peel only if it is a must
- Peel just before cooking
- Peel as thinly as possible
- Wash food well and drain before peeling
- Never wash after peeling.

B) **Cutting, chopping, slicing**
- Cut after washing or straight after peeling.
- Cut into medium-sized pieces and not very small ones.
- Don't expose cut foods to air for long.
- Don't leave the food too long after cooking.
- Use stainless steel knives; choppers or slicers to maintain natural colour.
- Cut with a sharp knife to get even edges and good shapes.

C) **Soaking**
- Soak in as little water as necessary, just enough to cover.
- Don't soak too long.
- Don't throw away the liquid.

This section also described the nutrient losses due to cooking methods. Water-soluble vitamins leach out into the cooking water and are hence lost unless this water is used. Some of them such as vitamin C are also sensitive to heat. Thiamine is destroyed by cooking soda. Fat-soluble vitamins are more resistant and are not destroyed except during frying and roasting.

To keep cooking losses to the minimum, it is important not to overcook and not to add substances such as soda. All extra water or fluid left after cooking should be used in soups, curries or other preparations.

You were also introduced to changes in various nutrients due to cooking. Starches gelatinize on moist heating and form dextrins on dry heating. Sugar forms syrups and caramel. Proteins thicken and coagulate as foods containing them are heated such as meat, fish, eggs.