

1. Details of Module and its structure

Module Detail	
Subject Name	Food, Nutrition for Healthy Living
Course Name	Food, Nutrition for Healthy Living
Module Name/Title	Meal Planning And Minimizing Food Wastage - I
Module Id	FNHL_101011
Pre-requisites	General knowledge about Meal Planning And Minimizing Food Wastage
Objectives	<p>After going through this lesson, the learners will be able to understand the following :</p> <ul style="list-style-type: none">• To understand what is meal planning and its importance• To understand the principles that guides meal planning• To understand factors to be considered while planning meals for individuals
Keywords	Resources, Meal appeal, Nutritional adequacy, Economic consideration, Age, Gender, Physical activity, Time, energy and skill considerations, Seasonal availability of foods

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1. Concept of Meal Planning

Adequate and appropriate meals are imperative for the growth, development and survival of human beings. This chapter will discuss about the concept of meal planning its principles, advantages and the factors that are necessary to be considered while meal planning. A nutritionally balanced meal ensures that the body gets all the nutrients in the required amounts. There are several factors that determine meal planning, which must be considered before meals are planned, cooked and served to individuals. A careful consideration is required for planning nutritionally balanced and acceptable meals that are prepared with the optimal use of available resources. A sound knowledge about the different food groups, the food items each food group consist and the nutrients provided by them will help in guiding food selection and thereby aid in the process of meal planning.

The chapter will also talk about the role of meal planning in reducing food wastage. The matter of food wastage is of great relevance from the point of food insecurity and undernutrition that our country is challenging today. A meal, planned with keeping in mind the factors affecting meal planning, will help in minimizing wastage of food at the individual and household level. Minimising food wastage from the point of food insecurity and undernutrition is a great challenge faced by our country today.

2. What is a Balanced diet?

You have already studied the concept of balanced diet in detail in the previous chapter. A diet consisting of a variety of food items in amounts that provide all the required nutrients in adequate quantities constitutes a balanced diet. A balanced meal helps in meeting the nutritional requirements of individuals and thus maintaining good health and well being.



One will be able to plan a balanced diet if one has a sound knowledge of the different food groups and the various food items falling within these groups and also the nutrients provided by these food

items. In the previous chapters you have studied about different food groups, nutrients and their functions and how this knowledge helps in guiding the selection of foods for individuals to promote healthy lifestyle from the early age itself. Now let us apply this knowledge of selecting the right food items from each food group to assist in meal planning and providing nutritionally adequate meals

3. What is Meal Planning?

A **meal** is an eating event that takes place several times during a day on a daily basis and includes different foods prepared to be eaten during a specific meal time whether at home or eaten outside in [restaurants](#), [cafeterias](#) etc. A typical meal usually consists of breakfast, lunch, dinner and few healthy snacks. Each meal usually includes foods from more than one food group.

Good nutrition is a primary human need. Healthy and nutritious meals ensure that the goal of optimal health and wellness is achieved. Meal planning is one such means to attain that goal.

Meal planning is a process that involves consideration of several factors prior to purchase and preparation of food. Meal planning helps in deciding what to eat in a day such that the meals prepared are nutritionally adequate yet palatable for individuals making the best use of the available resources. Figure 1 shows the different steps involved in planning meals.

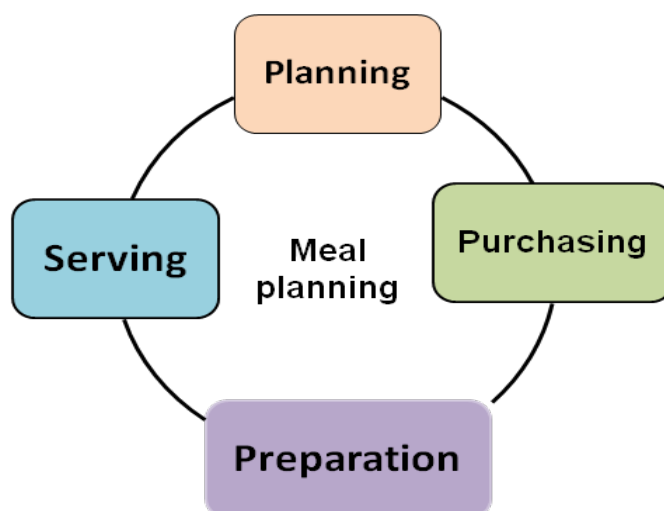


Figure 1: Steps in meal planning

A typical day's menu showing food items for five meals has been given below in **Table 1**.

Table 1: A day's menu

MEAL TIME	MENU
Breakfast	Milk Porridge Vegetable Sandwich
Lunch	Chapati/rice Aloo methi vegetable Bengal gram dal Onion raita
Evening snack	Tea Sprouted pulse and fruit chaat
Dinner	Chapati/Rice Chicken Pea potato vegetable Desert-Carrot Kheer



Advantages of meal planning

- Helps in meeting the nutritional requirements of each person
- Take into consideration the food preferences of individual members
- Allows one to select foods from different food groups and avoid meal monotony
- Helps to reduce one's expenses on labour and fuel and saves energy
- Enables to keep the expenditure on food within the budget
- Minimize food wastage. Leftover food can also be used effectively

4. Principles of meal planning

Meal planning is based on certain principles that guides planning and determines its success in providing nutritionally adequate, wholesome and palatable diets prepared using the available resources. Meals should be planned in advanced weekly Let us understand what these basic meal planning principles are (Figure 2).

Nutrition: Food is important to sustain life. The foods that one eats must provide all the essential nutrients required by our body. Therefore it is very important that the prepared meals must fulfill this function of food and meet the nutritional requirement of the individuals for whom it is prepared. One must select nutrient dense foods from various food groups using their knowledge of the right food selection while planning meals. Without good nutrition individuals will not be able to

achieve their full growth and development potential. The consideration of nutrition while planning meals contributes to the wellness of individuals.

Resources: If one wants to prepare a meal one would need certain resources for it. Can you think of some resources or materials that would be required for preparing meals? These are the resources of time, money, energy, food, utensils, cooking gadgets etc. Also, to plan a healthy or nutritious meal the human resources can be skill and knowledge. If meals are expensive and require more skill and time to prepare no matter how nutritious they may be, they are less likely to be cooked by individuals. A perfect meal is the one that is nutritious, tasty and have been cooked with minimum available resources.

Example, a person may have all the raw ingredients for making *dal*, *chapati* and vegetable and the required equipments also, but if he/she lacks the skill of making these food items then the meal cannot be prepared.

Meal appeal

One should enjoy the food that one eats. One would definitely like to eat the food if it looks smells and tastes good and all these will increase the appeal of the meal to the individual to whom it is served. Meal appeal includes the appearance, flavor, colour and texture of the food served.

A nutritious meal will not serve its purpose if it is not liked by individuals. Eating the same foods daily may become boring. Selecting foods from within and among the major food groups adds to the variety and enhances meal appeal. Attractive meals stimulate the appetite. The planned meals should be small, frequent and regular rather than bulky. Meals can be more palatable by blending colors, flavours, taste, and textures ensuring greater acceptability by individuals.

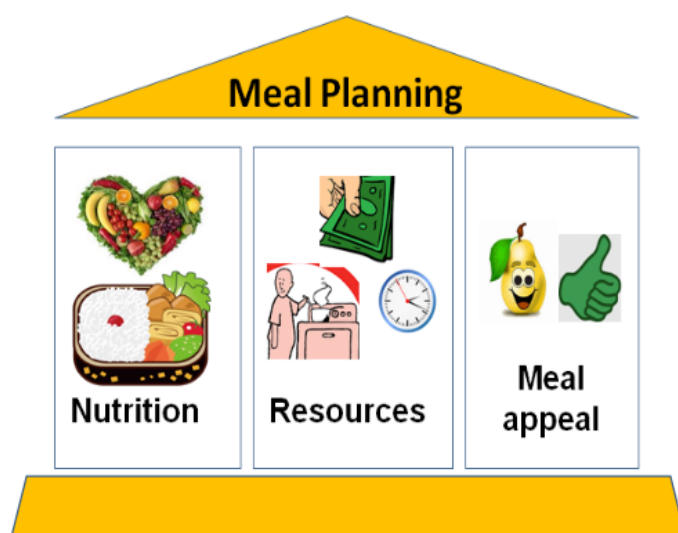


Figure 2: Principles of meal planning

5. Factors affecting Meal Planning

There are certain factors that one should keep in mind while planning meals which results in effective meal planning. What are these factors? Let us study them:

1. Nutritional adequacy

We have already studied the importance of various nutrients that food provides to us. If we do not get these nutrients in the required amounts our body will become deficient in these nutrients which in turn will affect our health. This will affect our ability to study or work properly. Therefore it is very important that the planned meals are nutritionally adequate meaning that nutritional requirements of all the family members are fulfilled.

These requirements differ from one member to another on the basis of age, gender, activity and physiological condition. For example a pregnant mother needs more energy, protein, iron and calcium than non pregnant women. Therefore a special consideration must be made to include foods that provide these nutrients in sufficient amounts. Dietary requirement of adolescent is more as it is a period when growth is taking place rapidly. As you have already studied in the previous chapter that foods can be classified into three categories based on their functions. Can you recall the three categories? They are as follows-

- **Energy giving foods**- These foods provide energy to perform our daily activities and include foods such as cereals, oils and nuts which are rich in energy.
- **Body building foods**- These foods build our bones and muscles and help us grow and include pulses, meat, milk and milk products which are rich in protein and required for muscle building and growth;
- **Protective foods**- These foods improve our immunity and help in fighting against infections and include vegetables and fruits and they provide vitamins and minerals.

To ensure that meals are nutritionally adequate, foods from all these food groups must be included while planning diets. Meals should therefore consist of food items from different food groups that are energy giving, body building and protective foods.



Activity 1

Which one of the two meals given below in the table, is a nutritionally adequate meal and why?

Can you plan a nutritionally adequate menu for lunch that provides all the three categories of foods?

Meal I	Meal II
Chapati	Chapati
Rice	Black gram dal
Potato curry	Aloo methi vegetable
Pumpkin vegetable	Cucumber Raita
Pickle	Onion carrot salad



2. Economic consideration

Money is the resource which is required to buy food. Therefore while planning meals socio economic status of individuals must be considered. The meals that are planned should be within the budget of an individual otherwise it becomes difficult to implement the meal plan.

So how can we plan meals when the budget available to us is limited, without compromising on the nutrition aspect? One must have sufficient knowledge of the less expensive alternatives for the more expensive foods, which have much of the same nutritive value and can help in preparing tasty, nutritious meals for lower income families addressing the constraint of money available to buy nutrient rich expensive food items. Table 2, below shows the list of few food items. Column A has the items that nutritionally rich but are expensive and Column B list the less expensive alternatives for the items listed in column A.

Table 2 : List of food items

Column A	Column B
Expensive food items	Cheaper alternatives
Egg	Pulses
Paneer	Soyabean
Meat	Peanuts
Almonds, cashew nut	Gingelly seeds (<i>til</i>)



Activity 2

Can you compare the prices and also the nutrients provided by each of the items mentioned in Table 2. Write your observations

The cost of the meals can be reduced by

- ✓ Buying the items in bulk that is in large quantities than usual if one has enough space to store the food.
- ✓ One can also minimize overall expenditure on fruits and vegetables, bying seasonal fruits and vegetables.
- ✓ The food items can be bought from fair price shops like ration-shops, cooperative stores, etc.

3. Age

Recall the days when you were a small child. Did you use to eat the same quantity of food you eat today when you have grown up?

We must have observed this in our family that the food intake varies for different individuals within a family depending on their age. A new born infant drinks only breast milk and derives the required energy and other nutrients from it. A small preschool child eats less amount of food as compared to an adult who eats more in amount and variety. The elderly people in the family tend to eat less and they also prefer foods which are soft and easy to digest. An individuals' age is an important determining factor for selecting foods, in terms of texture, consistency and quantity while planning meals. Given below in Table 3 are the some considerations that one should keep in mind while planning meals for family members belonging to different age.




Infants	Preschoolers	Adult
Small appetite, frequent complementary feeding 	Small appetite, small frequent meals 	Large appetite, quantity of food must be increased to provide satiety
Micronutrient dense diet	High protein diet, calcium & <u>vit</u> A rich diet	High protein diet, calcium rich diet
Mildly <u>flavoured</u> and non spicy	Mildly <u>flavoured</u> and less spicy, attractive	Moderately spicy can be given
Semi-solid, solid or soft foods	Handy finger foods preferably	Normal household diet
Example: Porridge, milk, soup, mashed banana	'Packed <u>tiffin</u> ' should be nutritious & tasty such as Vegetable sandwiches, stuffed <u>parathas</u> etc.	Example: Mixed vegetable, <u>pulao, chapati, dal</u> 

Table 3: Considerations for meal planning for different individuals

4. Gender

While studying the chapter on RDA you must have noticed that the RDA for energy and protein is higher for a men than women. Man and woman have different body composition and are usually involved in different kind of activities. Hence their energy and nutrient requirement are different. Nutritional requirement of adolescent and adult males are more than their female counterparts. There are certain nutrients that are required in higher quantities by females such as iron, as compared to adult males. The protein, energy, iron and calcium requirement particularly, for pregnant and lactating women are greater than those for adult women.

5. Physical activity

The kind of activity by a person will determine the amount of energy and nutrient they will require and also the amount of food they would need to eat to fulfil that requirement.

For example a farmer who ploughs the field is engaged in a more strenuous activity (hard work) would require more energy thereby more quantity of food to supply enough energy so that he can carry out his work. While a man who is a shopkeeper and whose activity involves mostly sitting at the counter would need less energy. So planning the diet for the farmer would require inclusion of more energy giving foods. Similarly a sports person may be an athlete would require more of the protein or rich body building foods as compared to a normal office going individual.

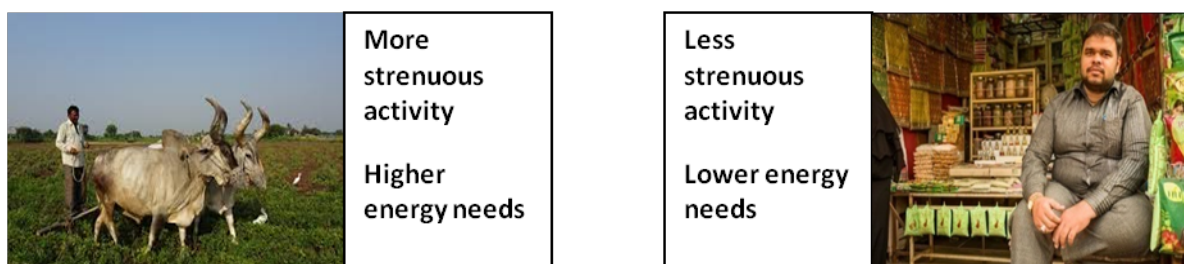


Figure 3: Nutrient requirements changes with activity

6. Time, energy and skill considerations

Time is a valuable resource and availability of time affect food choices. While planning meals one must pay careful attention to the time, energy and skill available in the family. In today's time when both man and women are working outside home, preparing elaborat dishes during meal times can be challenging as they would require considerable time, energy and skill. Therefore time needs to be budgeted for its optimal use. Some dishes require less time and skill for preparation and are yet nutritious. For example, a working mother could prepare a paushtikpulao, instead of preparing three or four items for dinner.

Some simple things that can be followed:

1. Special dishes that require skill and time for preparation can be planned on weekends or for special occasions rather than regular work days.
2. One can also utilize the time available while food is cooking to assemble other cold dishes and laying the table.
3. Dishes such as chicken can be cooked in advance, promptly cooked and chilled / frozen for the next meal
4. Batters for items such as Idli, dosa can be ground during the weekend and stored for a week. Similarly paratha doughs can be made in advance and can be refrigerated.
5. One can grind and keep ginger-garlic paste, tomato purees in advance and can refrigerate it.
6. Vegetables like carrot, peas, beans can be peeled, diced or chopped in advance, blanched and then freeze to use it during the week.

7. Seasonal availability of foods

Certain foods are available in summer and certain foods in winter or rainy season, especially fruits and vegetables. One must consider the availability of foods in a particular season while planning meals. Seasonal foods are easily accessible, less expensive, tasty and more nutritious. Vegetables like fenugreek, bathua and carrot are available in winter season while vegetables such as bottle gourd, lady's finger are available during summers. Seasonal fruits and vegetables should be preferred.



Activity 3

Can you name few seasonal fruits and vegetables, available in the summer and winter season other than mentioned here?

8. Climate

Food intake is determined by the climate and temperature of a place. In places where the temperature is relatively hot, the meals prepared should be light and mild. In places where the climate is relatively cold, hot meals which are nutrient rich like soups, stews, fish, nuts, nut butters should be given in moderation.

9. Religion, region, cultural patterns, traditions and customs

India is a land of diversity. Food preference/preparation is largely determined by the local produce

in a geographical region. Regional factors play significant role in meal planning. For example the staple diet of a south Indian would consist of more rice and lentils. In North India wheat is widely grown and consumed. Curries are often consumed in North India. People living near the coastal region, will consume more of coconut and fish as it is readily available in these areas.

A person's food habits will determine meal planning. For example, for a non vegetarian person some meat must be included in the meal plan depending on the frequency with which they consume the non vegetarian foods in a week or month. The traditions and customs of an individual must also be taken into account. For example Hindus do not eat beef and Muslims do not eat pork.

Activity 4

Find out a few traditional dishes of any Indian state that you like other than the one you belong to? Also compare how does it differ from your traditional diet in terms of the staples consumed, desserts etc.

Are there any foods that are not eaten in your areas because of certain customs or beliefs? Also find out if any of the foods banned are nutritious food

10. Variety in colour and texture/ Sensory appeal

Which is your favourite food? Can you eat your favourite food everyday for a week continuously? An individual does not like to eat their favourite food, if it is being served often. How can one make meals more appealing, attractive, acceptable and satisfying? This can be done by adding variety in terms of colour, texture, flavour, consistency and method of preparation. It increases the acceptability of the planned meals. This way the planned meals can be tasty and at the same time nutritious. The five characteristics of meal appeal include colour, shape, texture, flavour and temperature.

- Combine different colours to make the meal interesting and attractive
- Try to incorporate different flavours in different meals
- Texture of different foods can vary from soft, crunchy, smooth or chewy
- Serve food attractively with a small garnish.



Activity 5

Which snack according to you is more appealing and why?



a) Suji upma



b) Vermicelli vegetable & nuts upma

11. Likes and dislikes of individuals

The food that is planned and served must carefully take into consideration individual likes and dislikes. Food preferences are usually determined by eating habits a person develops during childhood. Sometimes other governing factors that can influence food preference are availability of certain foods in the area, peer group influence, and advertisements which can modify the likes or dislikes for a particular food item.

People will not eat something they do not like. One can change the form of the food if that particular food is disliked by individuals instead of completely eliminating it from the meal plan specially when the food is very nutritious.

For example if one has to prepare a meal for a preschool child who is not very fond of vegetables and milk, which menu would you prefer to make the meal more acceptable to the child. Consider the two menus for lunch in Table 4, Which according to you is better and has more acceptability.

Table 4: Menus for lunch	
MENU I	MENU II
Chapati	Methi roti/paratha
Moong dal	Rajmah
Aloo methi vegetable	Cucumber raita
Cucumber and carrot salad	

In the above example as the child disliked vegetables, it can be given the form of stuffed paratha or chapatti, vegetable cutlets vegetable raita or pakodas so as to provide green leafy vegetables in adequate amounts., vegetable raita etc. Milk can be given in the form of curd, raita, panner or paneer.

12. Meals should provide satiety value

Meals should be planned in such a way that they provide satiety so that one does not feel hungry till it is time for the next meal and yet at the same time are not bulky. While planning meals the interval between meals and the frequency of meals should be taken into account. For example if the time interval between breakfast and mid morning is small, a light snack can be provided such as fruit salad or vegetable salad. If an individual does not eat anything during mid morning then a substantial nutritionally adequate breakfast must be consumed that provides enough satiety value till lunch. Meals with inadequate satiety will lead to early onset of hunger pangs and hence will affect the working capacity and efficiency of a person due to insufficient nutrients available to the body.

Satiety is feeling of fullness after eating

13. Schedules of family member

How many meals do you usually consume while at home during school holidays? Is it different from usual school days? Yes, it is, which suggests that while planning meals it is necessary to consider the meal time routine of the individual members such as number of meals eaten at home and eaten away from home. Diet should be planned in accordance with the eating routine for example, a school age child eats his/her mid morning in school and the other three major meals at home. The packed tiffin should be planned in such a way that it can be easily packed and food retains its taste to the maximum even when eaten cold and the nutritive value is not compromised.

14. Allergy concerns

Another important factor that requires consideration while planning meals is to know whether any member of the family is allergic to any particular food. Such foods must not be included in the meals rather their alternatives can be provided so that the nutrients provided by those foods are not compromised. Example, some people are lactose intolerant, which is the inability to fully digest milk sugar (lactose) present naturally in dairy products. Milk is one of the best source for good quality protein, therefore to ensure that the person who cannot digest lactose in milk can be given curds or soya milk instead which is also a good source of protein and most of the other nutrients present in milk such as the mineral calcium.

Activity 6

Is there any one in your family who is allergic to any food? If yes, what is it? What alternative of the allergic food item is consumed to compensate for the nutrients provided by it?

15. Special occasions

Meals that are prepared for special occasions are different from meals prepared on regular days. Food is linked with happiness therefore eating should be a pleasurable experience. During special occasions or festivals extra attention is given to the color, appearance, number of dishes to be included but at the same time the nutritional attribute should not be disregarded. Planning must be carefully done to include dishes that are nutritious yet at the same time suits the occasion.

For example on birthdays the option of baking a date and walnut cake or a carrot cake can be considered. Tasty nutrition Snacks can include items like vegetable spring roll, baked mushroom paneer pockets with tomato-tamarind chutney.



Carrot cake



Vegetable spring roll