My Food, My Choice

Introduction

We obtain nutrition from a variety of food items. The food items start with raw forms obtained from plants or animals. By the time these reach our plate they can look completely different. Raw foods are not always easy to digest by the human body. Hence, these raw foods are processed to make them easier to digest, or to enhance their taste.

Food items are also processed to prevent spoilage and store them for long time. Both raw and processed food items undergo a variety of changes with time. These changes sometimes enhance the taste and nutritional value of the food. Some nutrients in food also decrease with time, even with the use of preservation techniques.

In this unit, we shall look at a few foods we observe around us and how they change with time. Then we shall look at packaging and advertisements and understand how these may affect our choices of the food items we eat.

Task 1: What spoils first?

You may have come across many methods of food processing.

Q1. Can you give some examples of food processing methods?

_____
_____
_____
_____
_____
_____

Q2. How is food processing different from preservation of food?

_____
_____
_____
_____

Now we shall take a few food items, some of which have been processed by different methods and study changes in them over a few days.

Materials required:

A slice of tomato, a slice of cooked potato, a spoonful of tomato ketchup or *chutney*, a potato chip, a spoonful of wheat flour and a piece of bread or *chapati*, petri-dishes or watch glass.

What will you do?

Keep all the food items in plates or watch glasses separately and label them. Make sure you cover the plates with a lid or a beaker (in case of watch glass). Observe them everyday for change (if any) in color, appearance or smell. You can record the observations in the table below. Repeat this for 3-4 days or until your teacher asks you to record.

Note: The spoilt foods can be put in composting piles or discarded as ‘wet waste’ after the end of the activity.

Table 1: What changes do you see in the food samples you are observing? Record in the table below

Tomato / **Potato** / **Wheat**	**Day 1**	**Day 2**	**Day 3**	**Day 4**
Colour				
Appearance/ Texture				
Smell				
Ketchup / **Chip** / **Bread or Chapati**	**Day 1**	**Day 2**	**Day 3**	**Day 4**
Colour				
Appearance/ Texture				
Smell				

While you observe changes in food items you kept, think about the following questions.

Q3. What do you understand by ‘spoilt food’? What’s the difference between spoilt and unspoilt food?

Based on your observations recorded in the table above, answer the following questions.

Q4. Which all foods have spoilt? How do you know they are spoilt?

Q5. Which food was the first to spoil? Is that food item raw/preserved/processed?

Q6. Which foods are still fresh and why have they not spoilt?

Q7. What is DIFFERENT in the food on the right side from those on the left side. What additional ingredients are added to foods on the left side to make the product on the right?

Tomato	**Ketchup/chutney**
Potato slice	**Potato chip**
Wheat flour	**Bread/*Chapati***

Table 2

Task 2: Analyzing Changes in Food

Food spoilage can occur due to various processes within food. These processes may happen due to internal changes within the food or due to environmental conditions. A few of them are discussed in the table below:

Process	**Changes which occur in this process**
Drying	Skin becomes dry and wrinkled, rough texture (e.g dried carrot or radish)
Absorbing moisture from air	Food becomes watery or soft. (e.g., chips becoming soft in humid air)
Hardening	Rough texture, becomes hard. (e.g. ladyfinger/bhindi becomes hard with time)
Microbial action	Smells different, fluids come out of the food, change in structure (becomes

	soft/slimy/clumpy) and colour of food, e.g. green mould developing on orange or apple peels.
Ripening/over ripening	Smells different. Food becomes softer/pulpy. E.g. ripe banana become brownish and watery if kept for days

Table 3

The processes and corresponding changes discussed in Table 3 are desirable in some cases and unwanted in other situations. Complete the following table with appropriate examples.

Process	**Example when it increases the taste or quality of food**	**Example when it spoils food (makes it unfit for consumption)**
Drying		
Absorbing moisture from air		
Hardening		
Microbial action		
Ripening		
Freezing		
Heating		

Table 4

Q1. Can storage of food for long time cause any change in the nutritional composition of food? If so, what could be the possible reasons for these changes?

_____

_____

_____

_____

_____

_____

Q2. How do you think preservation helps in preventing undesirable changes in food. Does no change in food appearance and taste mean no change in the nutritional quality of food?

Q3. What effects do preservation techniques or preservatives have on the nutrient quality of food?

Note: The objective of using food preservation techniques is to stop or slow down the changes which could lead to food spoilage. But it can also negatively impact the nutrients present in the food. For example, boiling of milk reduces ascorbic acid (vitamin C) content in it.

Task 3: Packaging – Explore the labels

Packaging is also a technique which aims at preservation of food, because it reduces damage or spoilage to food item due to environmental agents, and increases the shelf life of the food items.

Q1. What kinds of food packing have you seen?

Q2. Can you think of some advantages and disadvantages of packaging with 2 examples?

Besides preservation, packaging also allows some information & messages to be carried about the food. Have you ever CAREFULLY observed a packet of chips or *namkeen or* biscuit? Take a look at the food packet that you have brought or your teacher gives.

Q3. What information does it provide?(about the food, brand etc.)

Q4. Some information is printed in very small size letters and some information is printed in bigger size letters. Which information is printed in small size letters?

Q5. Which nutrients are present in the food packet you explored?

Q6. After reading the information labels on the food packet, is there anything that surprised you?

_____
_____
_____

Q7. Any other information which is NOT on the label but you think it should be added to the label?

_____
_____
_____

Note: Amongst other things, food packets also contain information about the energy (in calories) provided by the food item. Generally, the recommended daily calorie requirement is 2,000 calories a day for women and 2,500 for men. This value is not same for every individual as an ideal daily intake of calories varies depending on age, metabolism and levels of physical activity, among other things.

Task 4 – I crave...

We discussed about role of packaging and the information it carries.
We may like certain packed foods. It may be a crisp like chips or biscuit, a chocolate, a drink, a *namkeen* or some other packed food.
Q1. Which is your favourite packed food?

_____

Q2. What makes you buy that food? Tick whichever is applicable (You can tick more than one).

☐ I like its taste ☐ My friends like it ☐ It comes with a special gift ☐ I like its smell
☐ It is advertised by my favourite celebrity ☐ like its sound while eating it (crunchy)
☐ I like its texture & mouthfeel ☐ Its nutritious & provides health benefits ☐ Any other reason
Please state your reason

_____
_____
_____
_____

Q3.Is the packed food of your choice also advertised on the television/newspapers? _____

Now, your teacher will show you a video of a packed food/drink.

Q4. Is there anything that surprised you about the advertisement?

_____
_____
_____
_____

Q5. Now if you look at any food advertisement or information given on a food packet, what information you will look at to decide if you wish to buy that food item or not?

_____
_____
_____
_____

Possible Extension

In order to survive and work, our body needs energy. We get this energy from the food we eat. The amount of energy we get from each food item is measured in calories. Technically, one calorie is defined as the amount of energy needed to raise the temperature of 1 gram of water by 1 degree Celsius at standard atmospheric pressure. On many food packets, calorie typically written is actually a “kilocalorie.” In other words, it is the amount of energy needed to raise the temperature of one kilogram of water by one degree.

The calories present in packaged food items is usually mentioned on its food label. Have you ever wondered how these calories are calculated or measured? Originally, the calories in food were measured using a Bomb Calorimeter. This involved placing the food item in a sealed container surrounded by water. The food item was then ignited and allowed to burn completely. The resultant rise in the temperature of the surrounding water was measured. The number of degrees of rise in the temperature of the water was correlated to the number of calories generated by the burning of the food item. Even though useful, this technique had a few drawbacks. This technique measures the calories produced by the complete food item, but not all the components of food produce energy in our bodies. For instance, the fibre present in food is not utilized by our body to generate energy rather it is important for the process of excretion. Hence, the calories measured using this technique will be higher compared to the actual calories produced by the food item in our bodies.

Currently, the Atwater system is used commercially for determining the calories in food. In this system, calories are not determined directly by burning the foods. Instead, the total caloric value is calculated by adding up the calories provided by the energy-containing nutrients: protein, carbohydrate, fat and alcohol. Because carbohydrates contain some fibre that is not digested and utilized by the body, the fibre component is usually subtracted from the total carbohydrate before calculating the calories. The Atwater system uses the average values of calories per gram of protein, carbohydrate, fat and alcohol. These values were originally determined by using Bomb Calorimeter and then getting an average of the values obtained for different food items. The average values used by the Atwater system are as follows: 4 kcal/g for protein, 4 kcal/g for carbohydrate, 9 kcal/g for fat, 7 kcal/g for alcohol and 3kcal/g for organic acids.

Q. Using the above information, calculate the calories in different food items. You can refer the nutritional labels on the packaged food items for information on the amount of proteins, carbohydrates, fats and other components present in the food item.

http://www.merckmanuals.com/home/diso...

http://www.ars.usda.gov/SP2UserFiles/...

References

Dana Zeidler and Sami Khan. It’s Debatable: Using socio-scientific issues to promote scientific literacy K-12 NSTA Press