

General Science & Ability  
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Topic: Food Additives & Preservatives

Question:-

Explain the detail in  
Food Additives & Preservatives?

- Food Additives:

- Food additives are chemicals that keep foods fresh or enhance their colour, flavor or texture.

- A small percentage of people are sensitive to some food additives.

- Diagnosing sensitivity to food additives needs professional help, since one of the symptoms of sensitivity can also be caused by other disorders.

- Effects of food additives:-

Some people are sensitive to particular food additives and may have reactions like hives or diarrhoea.

This doesn't mean that all foods containing additives need to be automatically treated with suspicion.

All foods containing up of chemicals and food additives are not always "less safe" than naturally occurring

## Chemicals.

### - Types of food additives :-

The different types of food additives and their uses include:

- Anti-caking agents - Stop ingredients from becoming lumpy.
  - Antioxidants - prevent food from oxidising or going rancid.
  - Artificial Sweeteners - increase the Sweetness.
  - Emulsifiers - Stop fats from clotting together.
  - Food acids - maintain the right acid level.
  - Colours - enhance or add colour.
  - Humectants - keep foods moist.
  - Flavours - add flavor
- Food additives and processed food :-

There is a common misconception that processed food automatically contain food additives. Foods like long-life milk, canned foods and frozen foods are all processed, yet none of them need extra chemicals.

If you are unsure whether or not a product contains food additives without mentioning them on the label. For instance margarine might be a listed ingredient

and margarine contains food additives.

- Food additives and processed foods can cause

reactions:-

For most people, additives are not a problem in the short term. However, 500 of the 1000 currently approved additives in Australia have been associated with adverse reactions in some people. Some food additives are more likely than others to cause reactions in sensitive people.

Some of these hypersensitive reactions include:

- Digestive disorders - diarrhoea and Colicky Pains.
- Nervous disorders - hyperactivity, insomnia and irritability.
- Respiratory problems - asthma, rhinitis and sinusitis
- Skin problems - hives, itching, rashes and swelling.

- Preservatives:-

1- Permitted levels

1.1 - Recommended additives to inhibit micro-organisms

- CHEMICAL PRESERVATIVES.

- Preservative :-

Sulphites and Sulphur dioxide, Sulphur dioxide gas and Sodium or potassium Sulphite, bisulphite or metabisulphite are the most common forms used.

Commonly used levels  
0.005 - 0.2 %

- Comments :-

Fruit puree can be preserved by adding 600ppm Sulphur dioxide ( $SO_2$ ) and sealing in drums. The semi-processed fruit can be stored for several months. Most of the  $SO_2$  that is absorbed during storage is lost during drying. But it is recommended that the puree is boiled before drying to reduce the levels of residual  $SO_2$ .

- Preservative :-

Sorbic acid, Benzoic acid and Sodium and Potassium sorbate are used to inhibit the growth of moulds and yeasts. The activity of Sorbic acid increases as the pH decreases. Sorbic acid and its salts are tasteless and odourless when at levels below 0.3%.

Commonly used levels :-  
0.05 - 0.2 %

- Preservative :-

Benzoic acid, Benzoic acid, in the form of sodium benzoate, is a widely used food preservative suitable for acid foods. Benzoic acid is often used in combination with Sorbic acid at levels of 0.05 to 0.1%.

— Commonly used levels:—  
0.03-0.2%

— Preservative:—

Citric acid, Citric acid is found naturally in citrus fruit. It is widely used in carbonated drinks and as an aciduliser of foods. It is less effective at controlling the growth of yeasts and mould than the other acids.

— Commonly used levels:—  
no limit

— Preservatives - permitted levels in fruit products:—

The use of chemical preservatives is regulated by maximum permitted levels. These amounts vary between countries. Processors should check with their local authorities for the local regulations and for the regulations in the country of sale.

— Recommended additives to reduce PH:—

organic acids, which are both naturally present in foods during fermentation or which are added to foods. During processing, have been used for many years for food preservation. The most commonly used organic acids include Citric, Succinic, malic, tartaric, benzoic lactic and Propionic acids.

#### - Citric acid :-

Citric acid is found in citrus fruits. This acid is more effective than acetic and lactic acids at inhibiting due to a growth of thermophilic bacteria.

#### - Malic acid :-

Malic acid is found widely in fruit and vegetables.

#### - Tartaric acid :-

Tartaric acid is present in grapes and pineapples.

#### - Benzoic acid :-

Benzoic acid is the oldest and widely used preservative.

#### - Propionic acid :-

Propionic acid occurs in foods by natural processing. It is found in Swiss cheese at concentrations of up to 1%. It is effective against moulds and bacteria.

## — The Preservation Index:—

The preservation index is a measure of the preserving power of combinations of acid and sugar (sugar is measured as total solids). The index is used to assess whether a chutney or pickle is safe from food spoilage and food poisoning micro-organisms.

A correct balance between the levels of sugar and acid is needed to prevent the growth of mould after the chutney is opened.

The preservation index is calculated as follows.

$$\frac{\text{total acidity}}{(100 - \text{total solid})} \times 100 = \text{not less than } 3.6\%$$