All About Food Additives
For Teachers

Introduction

Food additives are a necessary part of modern food production to enable a supply of a wide variety of foods across economic, seasonal and geographical boundaries.

This program aims to teach students what food additives are and why they are used in food processing. Students will discover a global system that ensures safety and regulation of the additives in our food supply. The program will look at a variety of additives including colours, flavours, emulsifiers, gels, stabilisers, preservatives, antioxidants and processing aids.

Dr. Leif Lundin from the CSIRO provides an informative explanation of the topic. The program is presented with many visual demonstrations of food spoilage and preservation.

Timeline

00:00:00 What are food additives and why are they used?
00:07:41 Emulsifiers, gelling agents and stabilisers
00:12:35 Preservatives and antioxidants
00:16:22 Processing aids
00:19:28 Credits
00:20:02 End of program

Related Titles

Food Preservation Techniques
Industrial and Sustainable Farming
The Cooking Process – How Food Changes
No Accounting for Taste – Why We Eat What We Eat
Food Planning for Special Occasions

Recommended Resources

- http://www.understandingfoodadditives.org/index.htm
Student Worksheet

Initiate Prior Learning

1. **Teacher demonstration** – Bring to class a soft drink bottle with water and blue food dye in it. Drink it. Use student’s reactions as a discussion point on food additives, starting with colours. Also discuss with the class what they expect from a manufacturer when purchasing a product.

2. Class Discussion – What types of foods would you assume food additives are added to and why? Write down the responses.

3. Guess the food labels game. Write a list of the ingredients you think are in common food items such as bread, yoghurt, muesli bars, jam, tomato sauce etc. Look at food labels to compare.
4. Small group Brainstorm. Discuss what you think each of these words mean and give an example for each:

a) Colours
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

b) Flavours
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

c) Emulsifiers
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

d) Gels
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

e) Stabilisers
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
f) Preservatives

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

g) Antioxidants

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

h) Processing aids

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
Active Viewing Guide

What are food additives and why are they used?

1. According to Dr. Leif Lundin: Food additives are ________________ ingredients in
   __________________ food. They tend to function for ________________, quality,
   ________________ and so on.

2. a) What is the purpose of sorbic acid?

   __________________________________________________________________________
   __________________________________________________________________________

   b) What foods is sorbic acid commonly found in?

   __________________________________________________________________________

3. What are some of the health concerns of potassium and sodium nitrate?

   __________________________________________________________________________
   __________________________________________________________________________

4. Government authorities regulate our food supply. List the authority responsible in each country.
   a) Australia

   __________________________________________________________________________

   b) USA

   __________________________________________________________________________

   c) Canada

   __________________________________________________________________________

   d) Europe

   __________________________________________________________________________

   e) Britain

   __________________________________________________________________________
All About Food Additives

Colours and flavours

5. a) Why are colours added to foods?

_________________________________________________________________________________

_________________________________________________________________________________

b) Using the international coding systems, what range of numbers indicates an added colour?

_________________________________________________________________________________

c) Name two foods that might have added colours.

_________________________________________________________________________________

_________________________________________________________________________________

6. a) What is the role of flavourings?

_________________________________________________________________________________

_________________________________________________________________________________

b) Using the international coding systems, what range of numbers indicates an added flavour?

_________________________________________________________________________________

_________________________________________________________________________________

c) Name two foods that might have added flavour.

_________________________________________________________________________________

_________________________________________________________________________________

Emulsifiers, gelling agents and stabilisers

7. a) Give an example of how emulsifiers work.

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________

b) List other foods emulsifiers are common in.

_________________________________________________________________________________

_________________________________________________________________________________

_________________________________________________________________________________
8. a) What is the role of gelling agents?

_________________________________________________________________________________
_________________________________________________________________________________

b) Give one example of the type of foods that might contain gelling agents.

_________________________________________________________________________________

9. a) How are stabilisers used in the manufacture of chocolate flavoured milk?

_________________________________________________________________________________
_________________________________________________________________________________

b) Suggest one other food where a stabiliser might be used.

_________________________________________________________________________________

Preservatives and antioxidants

10. How do preservatives extend the shelf life of foods?

_________________________________________________________________________________
_________________________________________________________________________________

11. a) Explain how citric acid preserves foods.

_________________________________________________________________________________
_________________________________________________________________________________

b) What manufactured foods is citric acid commonly found in?

_________________________________________________________________________________

12. Name three natural sources of antioxidants.

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
Processing aids

13. Give an example of a processing aid.

_________________________________________________________________________________
_________________________________________________________________________________

14. Do you think processing aids should or shouldn’t be included on food labels? Why/why not?
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
Extension Activities

1. Food spoilage observation – over a week observe a variety of foods for their deterioration. Look at the appearance such as colour, mould, texture, shape and also odour. Foods that could be used are bread, dried biscuit, banana, strawberry, zucchini, potato, dip.

2. Classroom debate – have a debate on whether food additives are necessary in our food supply. Give students time to complete internet research first.

3. Practical Lesson – make a food item that will keep for a long period of time such as jam. Discuss the role of sugar and pectin in jam making.

4. Internet research – bring to class a variety of empty food containers. Research the food additives in that product (usually listed as a number). (a) What it is? (b) Its role is in the food item.

5. Informative piece – in groups, make an informative piece to explain to other students what food additives are. You could make a video, PowerPoint, magazine, poster etc.
Suggested Student Responses

Active Viewing Guide

What are food additives and why are they used?

1. According to Dr. Leif Lundin: Food additives are minor ingredients in manufactured food. They tend to function for stability, quality, colours and so on.

2. a) What is the purpose of sorbic acid?
   To help prevent mould and fungi growth.

   b) What foods is sorbic acid commonly found in?
   Baked products, beverages, seafood, dairy & confectionery.

3. What are some of the health concerns of potassium and sodium nitrate?
   Headaches
   Asthma
   Stomach upsets

4. Government authorities regulate our food supply. List the authority responsible in each country.
   a) Australia
      Food Standards Australia and New Zealand (FSANZ)
   b) USA
      Food Drug Authority (FDA)
   c) Canada
      Health Canada
   d) Europe
      European Union
   e) Britain
      Food Standards Agency (FSA)

Colours and flavours

5. a) Why are colours added to foods?
   So they look visually appealing to the consumer.

   b) Using the international coding systems, what range of numbers indicates an added colour?
   100-182

   c) Name two foods that might have added colours.
   Answers will vary but may include two of ice cream, jams, confectionary.

6. a) What is the role of flavourings?
   Add to the existing flavour and whole eating experience.

   b) Using the international coding systems, what range of numbers indicates an added flavour?
   620-642
c) Name two foods that might have added flavours.
   Answers will vary but may include two of canned foods, gravy and stock powders, breakfast foods, sauces and ketchups.

Emulsifiers, gelling agents and stabilisers

7. a) Give an example of how emulsifiers work.
   In mayonnaise the egg yolk is an emulsifier as it helps to combine the oil and water, so they don’t separate.

    b) List other foods emulsifiers are common in.
       Peanut butter
       Salad dressings
       Margarine

8. a) What is the role of gelling agents?
     They help control the texture by thickening the food.

    b) Give one example of the type of foods that might contain gelling agents.
       Answers will vary but may include one of custard sauce, dairy desserts, fruit pies, and jellies

9. a) How are stabilisers used in the manufacture of chocolate flavoured milk?
     The make sure the cocoa doesn’t settle out of the milk to the bottom of the container.

    b) Suggest one other food where a stabiliser might be used.
       Many answers possible, including ice cream, yoghurt, sauces and dressings.

Preservatives and antioxidants

10. How do preservatives extend the shelf life of foods?
     By prohibiting mould, bacteria and yeast.

11. a) Explain how citric acid preserves foods.
     Helps to prevent the discolouring of fruit, which is caused by oxidation.

    b) What manufactured foods is citric acid commonly found in?
       Jams, tin fruit, cheese, dried soup.

12. Name three natural sources of antioxidants.
    Answers will vary but may include three of citrus fruits, herbal teas, berry fruits, green leafy vegetables, carrots, dark grapes, papaya, and pomegranate

Processing aids

13. Give an example of a processing aid.
    Answer will vary but include: organic acids or chlorine washes to wash fruit and vegetables; stearoyl lactylate to strengthen dough in frozen products; some food colourings.

14. Do you think processing aids should or shouldn’t be included on food labels? Why/why not?
    Answers will vary