

What's in our Food? – a look at food labels

Contents: Survey, analysis and discussion concerning food labelling and food additives.

Time: Homework plus 2 periods of classroom time, depending on extent of discussion.

Intended use: GCSE Biology, Chemistry and Integrated Science. Links with work on food and food preservation.

Aims:

- To complement and revise prior work on food and food preservation.
- To develop awareness of the information available on food labels.
- To develop informed understanding of the function, advantages and disadvantages of food additives.
- To develop awareness of some aspects of food technology.
- To provide opportunities to practise skills in data collection and analysis.

Requirements: Students' worksheets No. 104. If possible, the booklet, *Look at the Label*, (see below). If the food survey is to be done in class rather than at home, a range of packaged foods will be needed.

The use of food additives is controversial. Food manufacturers say they are indispensable for ensuring food is attractive and acceptable and to prevent food spoilage. Environmental and consumer groups often dispute this and claim that additives are used unnecessarily and without sufficient knowledge of their long-term effects. This unit encourages children to find out what is in food and to consider both sides of the controversy.

Part 1 A survey of food

Part 1 is best done at home, though it could be done in class if the teacher brings in suitable foods. It is important to examine a wide variety of foods in a representative 'shopping basket'. The questions on the survey (Q. 1–4) can also be done at home, or as a follow-up in class. The answers to the questions will vary quite widely depending on the home background of individual students.

Part 2 Looking at additives

In this part, attention is focused on the additives in the ingredients lists, and students are asked to classify these according to their purpose. Before doing so, they should have read the Factsheet, which gives more information about additives.

Part 3 Do we need additives?

In this final part of the unit, students discuss the general question of the advantages and disadvantages of additives. This is best done in groups of three or four. The issues are of course very complex, particularly the matter of safety testing, and it is not intended that the students should grasp these complexities – rather that they should consider both the advantages and the disadvantages of the use of food additives.

A useful publication, called *Look at the Label*, is available from the Ministry of Agriculture, Fisheries and Food. It explains the food labelling regulations and gives information on datemarking, additives and so on. It includes a list of government-regulated additives identified by their serial numbers. The booklet is available free from:

Ministry of Agriculture, Fisheries and Food
Publication Unit, Lion House, Willowburn Trading Estate,
Alnwick, Northumberland NE66 2PF

A short film, also called *Look at the Label*, has been produced by MAFF. It is available on free loan or for sale, in video-cassette or 16mm film form, from:

CFL Vision
Chalfont Grove, Gerrards Cross, Bucks SL9 8TN

WHAT'S IN OUR FOOD? – A LOOK AT FOOD LABELS

Some of the food we eat is fresh, like apples and lettuce. But most of it has been **processed** in some way, to make it more attractive, to change its flavour or to make it keep longer. Processing food often involves adding chemicals, called **food additives**.

In this activity, you will be looking at some of the chemicals added to food.



- B Put the name of the food item in the first column. If the food has a datemark put it in the next column. Put a tick in the third column if you think the food is *completely* fresh and unprocessed.
- C If the food item is not completely fresh, look carefully at the packet or label. Does it show a list of ingredients? Put a tick in the appropriate column according to whether it does or does not. An example, 'vanilla flavour ice-cream', has been written in.
- D Now draw up a table like Table 2.

Table 2

Name of food item	Food ingredients, in order of amounts	Food additives
Vanilla flavour ice-cream	Skimmed milk, sugar, vegetable fat, whey solids	Emulsifier E471, Stabilizers E410, E407, Flavouring, Colours E102, E110

- E Table 2 will only be used for the foods whose ingredients are listed. The list of ingredients on the label gives the ingredients in order, with the main ingredient first, then the next largest, and so on. Look carefully at the list of ingredients on each food item. Decide which of the ingredients are actually food, and which are additives. You may need some help with this, because it is sometimes difficult to decide what is food and what is additive. Write the information in Table 2 for each food. (An example – 'vanilla flavour ice-cream' again – has already been written in.)

The Factsheet (pages 4 to 6) gives more information about food labelling and additives. Read the Factsheet before you go on to Part 2.

Use the results of your survey to answer these questions.

- 1 How many of your food items were
 - (a) fresh
 - (b) processed?
- 2 How many of the processed foods did not have a list of ingredients? (The Factsheet gives more information about which foods have to have ingredients listed.)
- 3 Look at the datemarks. Which kind of foods keep for the shortest time? (More about datemarks on the Factsheet.)
- 4 What is the difference between chocolate flavour yoghurt and chocolate flavoured yoghurt? (More about naming foods on the Factsheet.)

Part 2 Looking at additives

In this part you will be looking more closely at the additives in the food you surveyed.

- A Draw up Table 3 as shown below.

Table 3

Name of food item	Colouring	Flavouring	Preservatives	Antioxidants	Texture controllers	Others	Not sure
Vanilla flavour ice-cream	E102, E110	✓	—	—	Emulsifier E471, Stabilizers E410, E407	—	—

- B For each of the food items in your Table 2, write the name of the item in the first column of Table 3. Then enter the various additives in the appropriate columns. An example (the 'vanilla flavour ice-cream' used before) has already been written in.

If you are uncertain which column any additives go in, put them in the 'Not sure' column. If a type of additive is present, but not identified, just put a tick in the appropriate column (as in the 'flavouring' column for the 'vanilla ice cream' example).

Part 3 Do we need additives?

This part, which involves quite a lot of discussion of ideas, is best done in small groups of three or four.

Points to discuss

- For one or two of the food items in Table 3, try to decide what the food would be like *without* the additives. For example, what would vanilla flavour ice-cream be like without colouring? Without flavouring? Without emulsifiers and stabilizers?
- For the same food items, would you still buy them without the additives? Or would you buy a different food instead?
- Are some types of additives more useful than others? If so, which? Could we manage without *any* additives?
- Should we worry about the possible effect of food additives on our health? (Look at 'Additives and health' on the Factsheet)
- Without food additives the variety of food available in the shops would be much smaller (just imagine – no flavoured potato crisps). Would this matter?
- Some foods do not have to have a list of ingredients. These include fresh fruit and vegetables, cheese, butter and alcoholic drinks. Why do you think this is? Should *all* foods have ingredients lists?

Food Labelling Factsheet

The Government controls the labelling of foods. Fresh food does not have to be labelled, but most pre-packed food does (although there are exceptions). Figure 1 indicates some of the things the label must show.

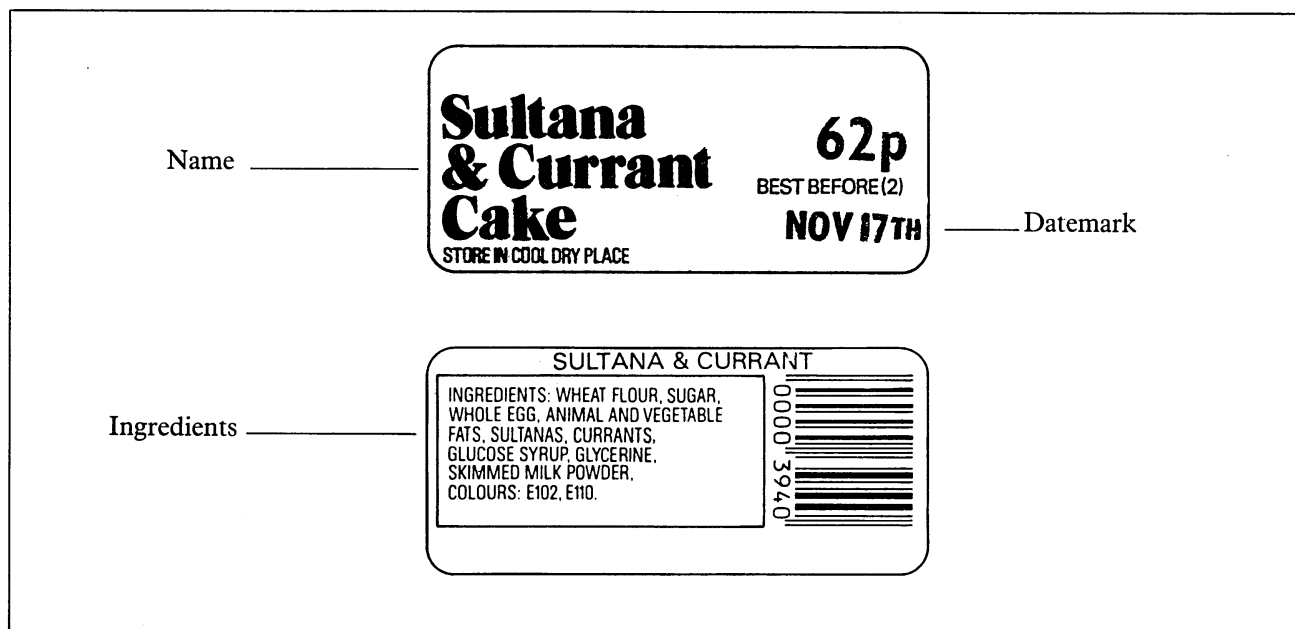


Figure 1

The Datemark

All food goes off eventually, though some foods go off faster than others. The datemark usually gives a 'Best before' date to help consumers and shops make sure it is in good condition. Some foods do not have to carry a datemark. These are mostly long-life foods (foods which last for more than 18 months).

The name

The name of the food should give information about what it really contains. For example, ice-cream can only be called 'Strawberry flavoured' if its flavour comes mainly from real strawberries. But if its flavour comes mainly from additives, not fruit, it must be called 'Strawberry flavour'.

The ingredients

Most, but not all, prepacked foods have to have a list of ingredients. This shows what went into the food. The ingredients are shown in descending order of weight. If *water* has been added to the food, it need only be shown if it makes up more than 5% of the weight.

Both food and additives are shown on the list of ingredients.

What are food additives?

Food additives are used for a number of different reasons, and these are described below. Most commonly-used additives are regulated by the Government, and most of these have a number. The number tells you what the additive actually is – for example, E330 is citric acid. An E in front of the number means the additive is also regulated by the EEC (European Economic Community).

Types of food additives

Colours

Colouring agents have numbers beginning with 1. They are used, for example, to make sweets and drinks look attractive. They are added to many foods to make up for changes in colour when the natural food is processed.

Flavours

Flavour additives are not regulated and do not have numbers. A flavour such as 'raspberry' or 'bacon' is usually made from a mixture of several different chemicals. The mixture is often a trade secret.

Preservatives

Government-regulated preservatives have numbers beginning with 2. They are used to stop bacteria and fungi growing in the food and making it go off.

Antioxidants

These have numbers beginning with 3. They help stop fats and oils being oxidized, which would make them taste sharp, rancid and unpleasant.

Additives which control the texture of foods

These have numbers beginning with 4. They include emulsifiers, thickeners, and gelling agents.

Emulsifiers are used to help make oily liquids and watery liquids mix (see Figure 2). For example, mayonnaise contains oil and vinegar. The vinegar will only mix with the oil if an emulsifying agent is added. (In traditional, home-made mayonnaise, the emulsifying agent is egg.) **Stabilizers** are used to stop the emulsion separating again.

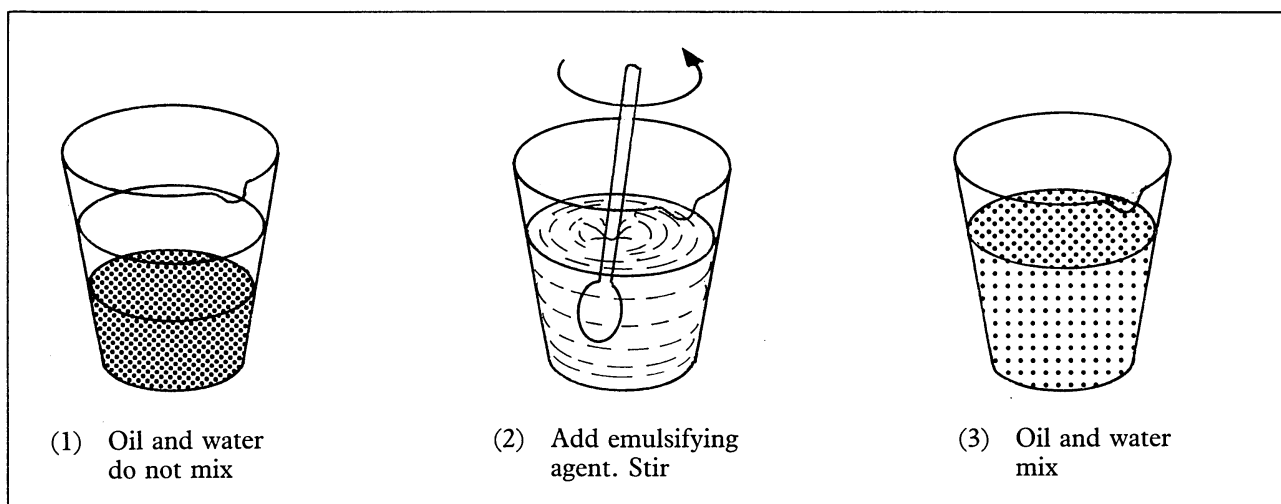


Figure 2 Making an emulsion

Thickeners, as their name suggests, are used to thicken liquids such as soups. **Gelling agents** make liquids set like a jelly. They are used in jams, for example.

Additives and health

Generally, food additives have to be tested for safety before they can be used. These tests are usually done on animals. Nevertheless, some people suspect that certain food additives could have a health risk. Certain people may be allergic to particular additives. It is possible that certain additives could cause cancer if taken in large quantities for many years.

The idea of safety-testing is to find out about health risks such as these, and to ban any additives that are at all doubtful. Government regulations are strict. Even so, it is difficult to find out from tests on animals exactly what an additive will do if regularly eaten by a human for long periods. For this reason, tests on additives leave a wide safety margin.

It is important to bear in mind that without some additives our food could be *less* healthy. Preservatives prevent food going bad, and prevent possible disease-causing microbes from growing in the food.