

## Chapter 1

### Questions, questions and more questions to ask and answer

From the feedback to Activity 1.1 and the points made in chapter 1, it is seen that the “right questions” should interrogate the problem presented, particularly for those details associated with: ‘Safety’, ‘Traceability’, ‘Labelling (including Content)’ and ‘Integrity of the source material’ (bulk and sample). Each problem scenario will have its own specific details but consideration of the above four headings is important. As stated before, you ask as many ‘right’ questions as needed to identify the problem and requirements for its solution in full.

#### Problem 1

A loaf of sliced bread, bought by a member of the public, has been brought into the local city council offices to alert Trading Standards of a contamination issue – where a strip of (what looks like) plastic has been found in the fresh packaged loaf. As the resident County Analyst, you are called in to evaluate the potential problem.

Provide a list of 10 questions you would ask in order to help “define the problem”.

#### Problem 2

You are asked, as an independent contract laboratory chemist to visit a small import company that brings in painted toys from abroad for selling to various outlets in the UK. There is an issue regarding the toy being made available to children because of the possible contents of the paint used in the toy’s production.

Provide a list of 10 questions you would ask in order to help “define the problem”.

#### Problem 3

Bottles of sunflower oil for cooking have been withdrawn from the shelves in a local supermarket by the store manager because they “don’t look right” and appear to have “gone off”. You have been called in as the Quality Control chemist for the supermarket chain to evaluate the problem.

Provide a list of 10 questions you would ask in order to help “define the problem”.

#### Problem 4

You are the company Control Chemist at a manufacturing plant which produces a range of Health and Beauty (also known as Vanity) products. A new production line manager has just entered your office at the end of the day with a sealed plastic vial about 60 mL in size containing an **unfamiliar** colourless liquid with what looks like a white, partially suspended material slowly settling out. He places this down on your desk and asks, “can you analyse this for me quickly; it shouldn’t be separating out like this”!

What questions would you put to the production line manager to help you “define the problem”?

### Question 5 Defining a food problem: mercury in tuna (FSA)

There are limits imposed on the levels of mercury, in edible fish that can be consumed in our diet. These limits can be presented in different ‘forms’ and therefore any regulations or guidelines which form the basis for a measurement have to be carefully scrutinised.

You are a food chemist working for a company that, among its many products, cans Tuna for human consumption. What are the limits imposed for mercury in edible fish, based upon i) the total Hg concentration in the fish, ii) the tolerable intake over time, iii) the tolerable intake based upon human body weight and iv) the tolerable intake based upon “chemical form” of the Hg. It is helpful to construct a list, allowing these values to be compared.

Hint: Where legislation and food are concerned, a good starting point is the European Food Safety Authority (EFSA). A simple on-line search using key words such as “regulations”; “Tuna” and “Mercury” will immediately provide helpful links. A similar approach using the United States food and drug administration (FDA) as a source also provides useful information.

### Question 6

You are a chemist working with the **Dairy Council** on the composition of milk products. A local newspaper has contacted you because there has been a rumour that the processing of whole milk to form semi-skimmed and skimmed milks reduces the calcium content. This would have an effect on our recommended daily calcium intake. Can you comment please?

Hint: This information is readily available through the relevant channels, on-line. You could start with the **Council** you are working with!

### Question 7

The introduction of recycled plastic sources into secondary plastics products for the general consumer has been identified as a potential problem because of certain metal and metalloid elements as well as certain non-metallic elements (other than the more common backbone elements of carbon, hydrogen, oxygen, nitrogen and sulphur) being present and possibly leachable. There is limited regulation with regard to the recycled source material’s use in secondary plastic goods at present but regulation is in place dependent upon the final plastic products usage.

What questions do you consider should be asked in order to identify potential problems from certain elements associated with the use of recycled plastics goods by the general public?

Hint: Consider the range of plastics goods you encounter in your home and your day to day environment and how they may impact upon your health and safety. Next, consider the official UK, EU and USA government bodies involved with the regulation and guidance of

these materials and/or elements from these, in our consumer environment and interrogate their web sites for possible guidance.

### Question 8

There has been considerable interest over the years in the plant known as “Cannabis”. This plant (*Cannabis Sativa* L.) has a number of strains, which results in a broad range of ‘cannabinoid’ content dependent upon the source.

While there are now well over 100 cannabinoid compounds identified, what from your investigations on-line, would you say are:

- i) The four more commonly encountered cannabinoids and their reported pharmacological properties?

Now,

- ii) One of these cannabinoids is known to be psychoactive. Which one is it?

And

- iii) At what concentration must this psychoactive cannabinoid be below in a selected cannabis cultivar in order for the UK “Home Office” to issue a licence for that cultivars production?

Hint: For parts i) and ii), peer-reviewed scientific papers / literature can be interrogated. Also, two cannabinoids and their pharma-properties are very well documented even in the popular press! For part iii) the UK government web site is a good place to start.