

Food – our primary rôle

Food – A Consuming Interest

Food is the largest single subject of world trade: an essential commodity to sustain life, and titillation for that most sweet of all senses, taste. Although not his or her only interest or activity, which extends to many areas of public protection, food is the *raison d'être* of the Public Analyst and the most important part of the work undertaken for the local authorities to which he is appointed.

Whatever your view, food is important to every living person, and the safety and quality of food has a bearing on everyone's life. For this reason the UK has legislation to control food in the form of the Food Safety Act 1990, to protect both the consumer and the fair trader.

The main provisions of the legislation are that food must not be rendered injurious to health, that it must comply with "food safety requirements", that it must be of the nature, substance and quality demanded (expected) by the purchaser, and that it must not be falsely described or misleadingly labelled. A comprehensive array of Regulations have been made to control specific aspects of food.

Enforcement of the Act is by Local Authorities, principally their Environmental Health Officers and Trading Standards Officers. Whilst these officers are empowered to take samples of food, the actual assessment in terms of chemical analysis or microbiological examination and subsequent interpretation that are necessary to determine whether a food complies with legislation is carried out by Food Analysts and Food Examiners respectively, scientists whose qualifications and experience are specified by regulations.

Public Analysts are the qualified Food Analysts who have been appointed by local authorities to undertake the analysis and assessment of food sampled by the authority. The statutory qualification for a Public Analyst is the Mastership in Chemical Analysis, which is the foremost qualification in applied chemistry in the UK and the only qualification that attests knowledge, ability, interpretational skills and legal report writing, with the Public Analyst's Certificate being submissible as evidence in court.

The Buck is Ours!

A significant factor always present in the Public Analyst's mind is that in relation to samples submitted to him it is he who decides whether or not something is wrong with a food – other officers in the enforcement system initiate the process by sampling the food, and decide what action to take as a consequence of the Public Analyst's decision.

In making that decision the Public Analyst is acutely aware that other people's livelihoods (thinking of the trader) or even lives (thinking of the consumer in the event of a serious hazard to health) depend on his decision.

This is the prime reason for the Public Analyst's great attention to detail and to the quality of the analysis undertaken in his laboratory – and why, regardless of the apparent reassurance given by routine quality control procedures in the laboratory, samples will often be checked and rechecked, sometimes by different methods, before the conclusion is reported.

Public Analysts never shirk from this grave duty – it is the very reason for their existence, and it is the responsibility at which their training is aimed and for which their specialist qualification, the Mastership in Chemical Analysis, ably prepares them.

Safety

Safety has always been a fundamental part of food legislation, and by the middle of the last century aspects of safety were given their own sections in the Food and Drugs Act in addition to the control provided by consideration of the nature, substance or quality of a food.

Provisions such as a prohibition on rendering food injurious to health or selling food that is unfit for human consumption have been reiterated in the most recent (1990) Food Safety Act, but strengthened by the creation of a separate concept of food being specifically required to meet Food Safety Requirements.

Regulations made under the primary food legislation also provide detailed control relating to food safety, with subjects ranging from hygiene to contamination by toxic or harmful substances such as pesticides, arsenic, lead and antibiotics used to treat livestock.

Consumer Protection

The central food legislation in the United Kingdom is the Food Safety Act 1990. One of the mainstays of the Act is the statement that “any person who sells to the purchaser’s prejudice any food which is not of the nature or substance or quality demanded shall be guilty of an offence”. This effectively means that food must be what it says it is, without anything added or taken away (unless the consumer is aware), and of the quality that a consumer might reasonably expect.

This principle was established in the earliest food legislation and has remained effectively unchanged through successive statutes since. Inextricably linked with analysis and assessment by Public Analysts as the specially qualified scientific experts needed to determine whether the requirements have been met, it is a tried and trusted approach to food enforcement, well proven in the courts, and limited only by the funds available to undertake the necessary investigations.

In addition the Food Safety Act requires that food must not be falsely described, nor labelled, advertised, or presented in a way that is likely to mislead as to the nature or substance or quality of the food.

All in all the provisions of the law are very comprehensive in terms of protecting the consumer from both fraudulent and careless activities of unscrupulous or negligent traders or manufacturers, which in turn provides a measure of protection from unfair competition to the honest and diligent trader.

Food Testing

In practice the Public Analyst receives samples of food that have been taken by either Trading Standards Officers or Environmental Health Officers, proceeding then to assess the food against the current legislative requirements.

This may involve testing for incidental contaminants such as moulds or insects, or residues of processing aids or treatments such as pesticides, or contaminants from the food source such as lead or cadmium, or checking that additives such as preservatives or colours are the permitted ones and do not exceed specified levels, or checking the composition of the food against any statutory requirements or the manufacturer's own label, or a combination of all these.

A substantial area of work is checking the composition of food against any statutory requirements or the manufacturer's own label, in order to check that the food is what it is supposed to be and that it is of adequate quality and that it satisfies all claims made about it.

Of recent interest have been the finding of beef in other meat products and the finding of levels of colour in some foods above the new statutory limits introduced from 1996 (the first quantitative limits ever placed on colours).

Sometimes samples of food will have been submitted as a result of a consumer's complaint, such as the maggot in a takeaway meal or a fragment of glass in a canned food. In these circumstances the Public Analyst is concerned to determine whether the complaint is justified, and assess the potential seriousness of the fault. For example, had the insect been processed with the food? (had it been cooked?). Was the "glass" indeed glass - or plastic (also a "foreign body", but less hazardous), or a crystal that had formed by deposition of natural salts in the food after canning (common in some products).

More clear-cut (pun not intended!), if somewhat more revolting, have been the mouse cooked in a loaf of bread - and sliced so that each slice bore a segment! Or the tip of someone's finger the loss of which one would have expected to have been noticed and the production line stopped.

Sometimes complaints are found not to be justified - and occasionally there is evidence of either sabotage or even the fraudulent manufacturing of evidence by the complainant, such as the needle in a loaf of bread, which could not have been present when it was cooked or sliced, and had not been pushed through the wrapper.

For their own protection food manufacturers will often commission the Public Analyst to analyse their products, knowing his legal standing and prime concern with the scientific truth, whereby he is able to provide independent high quality analysis to assist in compliance with the law and to assist in solving problems in production.

Past, Present & Future

The past century or so has seen great changes in the production and supply of food reflecting the social and technological development of the period, with perhaps the most recent effect being the heavy influence of high-profile advertising hype and fashions.

Improvements in transportation have increased the availability of different foodstuffs. Two major wars, particularly the Second World War, have challenged the ability to meet basic nutritional needs for large sectors of the population. Technological developments have brought new processes, new products, and even completely new food materials into the arena – and meanwhile improved understanding of nutrition and of the effect of various substances in food has led to changing criteria for best protection of the public.

One example to illustrate the complexity of changes is the development of pesticides, which at one time were seen as the solution to world famine - until the undesirable effects on the environment and long term risk to the consumer were realised. Meanwhile technological developments have included the introduction of new and novel foods only possible through the development of new processes or new additives, together with novel food sources such as vegetable proteins and even fungal proteins.

Everything is double-edged: new foods can be very satisfying for the consumer or can utilise food materials that would otherwise have been wasted - or they can enable manufacturers to persuade the consumer that a food is something it is not (such as a food ingredient legally called "meat" but that the average consumer would regard as carcass waste after removal of the true meat).

Similarly the development of novel proteins can allow the indiscriminate manufacturer to substitute a cheaper protein source for genuine meat or cheese in food products - or they can be used to provide improved choice for the consumer and a potential aid to alleviating food shortages. This is where the Public Analyst comes in – to analyse and assess the food against existing standards. And where standards do not exist the Public Analyst is empowered to determine what is reasonable in terms of safety and consumer protection.

The interesting thing is that despite their virtual anonymity Public Analysts have been here throughout (having been first appointed under the 1875 Act), playing a pivotal role in protecting the public (and fair traders) from detrimental changes that have occurred over the years, while welcoming genuine improvements in food and its control. And as scientists dedicated to their profession, they expect to still be providing an equivalent service in another century's time as no doubt there will still be the need to ensure protection of the public and fair trade howsoever technology and food law may develop!

Networking

Long before the modern buzzword 'networking' was coined, Public Analysts had been operating their own network.

As scientists dedicated to their profession, they realised from the outset that they did not have a monopoly on scientific development, knowledge or expertise. They therefore formed the Society of Public Analysts as long ago as 1875, to provide a forum for the exchange of information.

This society went on to become the Society for Analytical Chemistry, which eventually became the Analytical Division of the Royal Society of Chemistry, and the society's scientific journal *The Analyst*, also founded in 1875, is still in publication today, although now encompassing all aspects of chemical analysis.

After the Society of Public Analysts had expanded its membership to become the Society for Analytical Chemistry, Public Analysts found that their need to maintain close contact with others doing the same work was not being met fully and so in 1957 again created their own professional body, known as the Association of Public Analysts. They then launched another scientific journal (*The Journal of the Association of Public Analysts*), which today is a prime organ for the international publication of validated methods of analysis for enforcement purposes, and together they have collaborated on the inter-laboratory validation of analytical methods.

In addition to the need for exchange of information, Public Analysts soon recognised that it may not always be necessary or desirable for all laboratories to adopt all techniques. As a consequence in some specialist areas of analysis 'centres of excellence' have evolved, which typically are used by

other Public Analysts for reference purposes, or even to send routine samples when insufficient are submitted to be worth setting up particular techniques in their own laboratory.

This concept has gradually developed as technology and complexity of analysis have increased, and is recognised in legislation, with Public Analysts specifically being permitted to pass on samples of food to another qualified Food Analyst.

For the future Public Analysts have recommended that there should be a fundamental review of the national requirements for the scientific arm of the food enforcement service, in order to identify the best means of its provision today and into the future, given ever-advancing modern food production and analytical technology and the sophistication, complexity and far-reaching distribution chains. Once such a review has taken place any changes to the service can be engineered, to ensure the continuance of an effective public protection service for the next century and beyond.

Changing Times

Adulteration of food is generally can be far more sophisticated today than in the early days of food control, due in part to the technology now available to unscrupulous manufacturers – which in turn requires comparative advances in analytical technology to detect. At the same time it is surprising how often that most common adulterant, water, still appears, though its presence is often harder to prove.

Accidental faults with food, however, have the same cause and effect as ever, though improved awareness – particularly of hygiene – at least means that outbreaks of food poisoning are less common. When things do break down, however, the consequences can be more severe due to the wider distribution of food in today's market.