

## **Control of food additives and contaminants**

By H. M. GOODALL, *Ministry of Agriculture, Fisheries and Food, Great Westminster House, Horseferry Road, London SW1*

From the earliest times, governments have made various efforts to stop at least their more respectable citizens being poisoned or swindled by the less respectable of the food manufacturers. Laws, regulations and decrees of varying sense and effectiveness have been passed to prevent the addition of injurious substances to food and to stop all types of fraud from short weight to direct adulteration. The two aims that governments have had before them have been the protection of the consumer against damage to his health and against exploitation through commercial or industrial malpractice. As society has become more sophisticated, governments have also tried to defend the consumer from misconceptions about the products he buys and from contamination or unexpected composition of products even if they will not affect his health and are not due to any malpractice.

Probably the first general food law promulgated was the Netherlands Law of 1829 (*Wetten van het Koninkrijk der Nederlanden 1829*), followed by the British pure food law of 1860 (*Public General Acts, 1860*)—at that time, adulteration of food had become widespread and the Bill aimed at ending this unhappy state of affairs. During the debate on the Bill, one Member told the House that he had come to the conclusion that the only article of food that could be bought unadulterated was an egg—and this was because there was no means of introducing injurious ingredients into it! The Bill was much amended during its passage through the House and when it arrived on the Statute Book it was a fairly weak Act. But it was a beginning; it stimulated action on the general control of food in several countries and in Britain it led to the much more satisfactory 1875 Act (*Public General Acts, 1875*), the basis of all our food legislation.

The direct descendant of the 1875 Act (*Public General Acts, 1875*) is the Food and Drugs Act, 1955 (*Public General Acts, 1955*) on which all measures of our food standards control are based. This has two basic principles: protection of health and prevention of consumer exploitation. Section 1 prohibits the addition of any substance to food or the abstraction of any constituent from food if such alteration would render it injurious to health. Responsibilities for the implementation of the Act, and its counterparts in Scotland and Northern Ireland, are shared by the Ministry of Agriculture, Fisheries and Food, the Ministry of Health and Social Security, the Scottish Home and Health Department, and the Department of Health and Social Services for Northern Ireland. Using powers conferred on them by Section 4, Ministers may make regulations which seem to them 'to be necessary or

expedient in the interests of public health, or otherwise for the protection of the public' for a number of reasons which include 'for requiring, prohibiting or regulating the addition of any specified substance . . . to food intended for sale for human consumption . . .'. Section 4 also charges Ministers to have regard to the desirability of restricting as far as is practicable, the use of substances of no nutritional value as foods or as ingredients in foods. All foods sold in the United Kingdom for human consumption are subject to the requirements of this Section with the single exception of milk, for which separate controls are imposed, although cream (and any food containing cream or milk) is covered by Section 4. It should perhaps be noted that when making additive regulations under Section 4, Ministers are not imposing still further restrictions on the freedom of food manufacturers. They are, in effect, defining areas within which the trade may operate without running foul of the general provisions of Section 1.

#### *Advisory Committees*

Ministers have established two bodies of independent experts to advise them on matters related to the Act. The first, the Food Standards Committee (FSC), deals with compositional standards, and regulations relating to the description, labelling and advertising of food. The other, the Food Additives and Contaminants Committee (FACC), advises on all problems concerning the presence of chemicals in food, which are not normally considered of nutritional value. Both Committees may refer questions of toxicological hazard and safety-in-use of foods and adjuncts to the Pharmacology Subcommittee (PSC) of the Committee on the Medical Aspects of Food Policy set up by the Department of Health and Social Security. The PSC is also a body of independent experts; it includes a number of recognized authorities on cancer but, when appropriate, advice is also sought from the Consultative Panel on Carcinogenesis.

FACC members are drawn from industry, universities and public service, who bring to the Committee a variety of experience and knowledge. However, they all serve in a personal capacity and not as representatives of particular interests.

With contaminants, the aim of the FACC and government departments is to encourage good manufacturing and handling techniques to eliminate food contamination as far as possible, or to reduce to a minimum unavoidable quantities by setting limits as low as practicable, for example limits have been set for the arsenic content of food (Statutory Instrument, 1959, 1960) and for lead content (Statutory Instrument, 1961). The Ministry of Agriculture, Fisheries and Food also makes critical evaluations of pesticides, antibiotics and other chemicals in veterinary use, since their effects are clearly relevant to food.

With additives, the general policy is to produce statutory permitted lists for all classes, thus erecting a protective fence which, when completed, will mean that no additive unless it is on a permitted list, may be added to food. So far, permitted lists are in force for antioxidants (Statutory Instrument, 1966*c*), artificial sweeteners (Statutory Instrument, 1969), colours (Statutory Instrument, 1966*b*, 1970*b*), emulsifiers and stabilizers (Statutory Instrument, 1962*a*, 1970*a*), flour bleaching agents

and flour improving agents (Statutory Instrument, 1963), mineral hydrocarbons (Statutory Instrument, 1966*a*), preservatives (Statutory Instrument, 1962*b*, 1971) and solvents (Statutory Instrument, 1967*a, b*). But there are still two significant gaps in the protective fence; flavouring agents (of which approximately 2000 synthetic substances are at present in use), and a wide miscellaneous group which includes acids, bases, buffers, propellants and humectants. Recommendations on this last group were made in the FAAC report (Food Additives and Contaminants Committee, 1968) on further classes of additives.

It is not intended to hand down permitted lists of a permanent nature; the aim is to review each additive class every 5 years. When Ministers refer a topic to the FACC for review, comments and evidence are invited from all interested parties (Ministry of Agriculture, Fisheries and Food, 1965). The Committee, having no facilities for testing, relies on the reports of work carried out under other auspices. These include the research associations, and industrial and academic laboratories, both at home and abroad. Although neither the advisory committees nor the government departments to which they report undertake any testing, the research associations who carry out much of this work receive financial support from the Government. For example the British Industrial Biological Research Association, whose laboratories are entirely devoted to toxicological research and animal testing, receives three-fifths of its funds from the Government: the remaining two-fifths come from trade interests, though there is a considerable variation in the trade's support for its activities.

For each additive, the FACC has to be satisfied that there is a definite technological need or consumer benefit, that the use of the additive does not constitute a hazard to health and that satisfactory food use specifications are available. Recommendations are made for each additive requested in the industrial submissions, a specification is given for each approved substance and, where appropriate, limits are set on the amount that can be added to food. The use of many additives dates from a period when toxicological testing was neither required nor routine. If adequate testing has not been carried out meanwhile, the FACC can warn that the substances will be removed from the permitted list if further evidence of safety is not provided before the next survey. Naturally, if the results of tests prove unsatisfactory, authority to use the substances concerned may have to be withdrawn even sooner, for example cyclamates, Ponceau MX and brominated vegetable oils (Statutory Instrument, 1969, 1970*a, b*).

When an entirely new additive is proposed, adequate toxicological testing is required before its use is authorized. The FACC can help industry by giving a provisional decision at an early stage on the need for a proposed new additive. After all, the biological tests necessary to clear the new additive can take a number of years to complete and be very expensive. It has been estimated that it may cost £30 000 a year for 3 years to test a new additive; it is a waste of money and facilities to do this work if the additive is turned down because of inadequate need.

The FACC and PSC are not seeking to prove to everyone's satisfaction whether a particular substance is absolutely safe. They are advising Ministers on the execution

of their statutory duties under the conditions prevailing at the time. In doing so they must use their judgment in evaluating all the information available to them, both published and unpublished. If a genuine doubt exists but cannot be resolved quickly, they will naturally regard the safety of the public as the prime consideration. At all times the Committees act as independent experts and are certainly never subjected to pressure to arrive at a particular conclusion. Although Ministers are not legally bound to seek their advice or to accept their advice when they get it, for obvious reasons they normally prefer to have this expert advice before taking decisions in this highly controversial field.

#### *Assessment of safety*

Before any additive can be recommended, careful consideration must be given to its safety. It is never possible to give an absolute guarantee that a particular additive presents no hazard in food. As it is not possible in practice to carry out large-scale controlled tests on humans, it is necessary to rely largely on comprehensive animal tests (Ministry of Agriculture, Fisheries and Food, 1965; FAO/WHO, 1958; WHO, 1957).

It is very difficult to extend results obtained from animal experiments to man, consequently, in calculating an acceptable daily intake for man from the maximum daily tolerated dose producing no ill effects in animals, a safety factor of 100 is commonly employed. This factor may have to be increased or reduced in particular instances. The safety assessment calls for expert judgment of all the evidence available and may have to be modified in the light of experience of the additive's use and the results of further biological tests.

#### *Regulations and their enforcement*

The FACC's and the PSC's role in any review of additives is normally complete once their report has been sent to Ministers. The report is usually published (without any commitment by Ministers) and comments are invited before the relevant government departments announce their proposals for regulations. Again, there is a round of consultations before the regulations are drafted and laid before Parliament.

Where considerations of public health permit, Regulations normally come into force some time after being made, since an adequate period must be allowed in which to alter formulations and labels. The whole procedure may seem extremely laborious and time-consuming—but it does ensure that all points of view are fully considered before new regulations become effective.

Enforcement of the main provisions of the Food and Drugs Act and of the regulations is the statutory duty of the food and drugs authorities. These include the City of London and the Greater London Boroughs, the county councils, county borough councils and borough and urban district councils. The seaport and airport health authorities deal with imported foods. This procedure contrasts markedly with that in countries such as the United States of America and Canada, which have a central law-making and enforcing authority with testing facilities.

*Codex Alimentarius Commission*

The UK plays an important part in the Codex Alimentarius Commission's work. This is the main international food standards organization and is sponsored jointly by two United Nations bodies, FAO and WHO (see Davies, 1968). The Codex has commodity committees each dealing with a group of foodstuffs. Among six general subject committees, is one on food additives and another on pesticide residues. The Food Additives Committee endorses permitted levels of use for individual food additives and maximum permitted levels for contaminants in specified food items. This Committee also submits food additives to the Joint FAO/WHO Expert Committee for toxicological evaluation.

Considerable scope exists for international agreement on food additives. The more each country enters the food legislation field, the more likely it is to fix on different provisions and, so, the less easy it becomes to send food of exactly the same composition or containing the same additives to different countries.

In time, Codex will produce standards for each class of additive which, if accepted by the participants, will assist in removing such anomaly. Perhaps also it will lead to a more rational sharing between countries of the burden and expense of toxicological testing.

*Council of Europe (Partial Agreement)*

This group, which consists of the European Economic Community countries, Denmark, Switzerland, the Irish Republic and ourselves, is also engaged in work on food additives, particularly flavourings and packaging.

*The European Economic Community*

In conclusion, I will refer briefly to the European Economic Community's work on food additives. The problems of rationalizing the differing legislation of the member countries are so large and the Commission's staff devoted to it so small that little progress has so far been made. None the less, the Community's activities on food additives are of the greatest interest not only for the effects their actions may have on world trade because, in Europe, food standards are being prepared by an international body which can, in the last resort, impose its will on the members who must bring their legislation into line with the directive once it has been approved by the Community Council. Approval of a Community directive must be unanimous; this also has made progress comparatively slow. At present, only three Community directives are in force on food additives—on colours, preservatives and antioxidants.

These directives reflect consumer tastes, philosophy towards the use of colours in foods and types of commodity available to the consumers on the Continent rather than here. They will need to be amended to meet the needs of an enlarged community. However, the general principles followed by ourselves and the Community are the same. These are the protection of public health and a demonstrable technological need.

You will, I hope, agree that what I have said indicates that we are undertaking quite a comprehensive programme of work not only at home but in the international sphere. I am sure that the administration of our food law – for all its historical and

other quirks – is conducted with efficiency and humanity, bearing in mind first and foremost the interests and needs of consumers, but realizing at the same time the needs and difficulties of manufactures. We do realize however that neither we nor the system is perfect. None the less we can be reasonably content with what we have achieved so far. But we are not complacent for the future. Food additives work is slow, laborious and frustrating and not always the most popular activity with all our friends in the food trade; nor do we always feel that our efforts are properly appreciated by the consumer whose interests we try to serve. Very often as we stand in the firing line we get the feeling that the cry is ‘Do not confuse me with facts—I have made up my mind’. But we comfort ourselves with the thought that we are doing necessary work, directly linked with the well-being of everyone, and I really think that in Great Britain and Northern Ireland we have made a more effective stab at it than in many other countries. If we eventually join the Common Market we shall of course be faced with new challenges. I have no doubt that we can meet these challenges and that we are well equipped to play a leading and constructive part in the development of food additive controls in an enlarged Community.

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