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# GENETICALLY MODIFIED FOODS: WILL LABELLING PROVIDE CHOICE?



Briefing Number 1  
March 1998

This briefing examines the debate over the labelling of genetically modified foods with particular reference to:

- public concern over genetically modified foods
- the response of industry and regulatory authorities to the demand for labelling
- the confusion surrounding current and proposed regulations
- recommendations for solutions

Genetically modified (GM) foods are already on supermarket shelves. In 1996, the UK-based multi-national company Zeneca launched their tomato paste made from tomatoes which had been genetically engineered to soften more slowly. The tomato paste is sold as 'own brand' by Safeway and Sainsbury's supermarket chains and has been voluntarily labelled as "*made from genetically modified tomatoes*".

In the same year, Monsanto's 'Roundup Ready' soybean, which has been genetically engineered to be resistant to the herbicide *glyphosate* (Roundup), was imported into Europe from the US mixed with traditionally bred soybean. Products of soybean, including oil, flour and lecithin, are widely used in processed foods and it has been estimated that around 60% of products on supermarket shelves contain soybean derivatives and therefore could contain the Roundup Ready variety. As yet, there are no statutory requirements for all of these products to be labelled.

Opinion polls and other research projects have consistently demonstrated that knowledge about whether a food has been produced using genetic modification is important to the European public.<sup>1</sup> This has led to widespread support for the compulsory labelling of such foods.<sup>2</sup>

However, there is considerable muddle and confusion over labelling and progress has been impeded by inappropriate technical argument. Soybean and tomatoes are just the beginning of an avalanche of genetically modified crops that are expected to reach our tables over the next five years. 'Living' GM foods such as fresh fruit and vegetables will have some sort of label but, when included in processed food, this information may disappear. Unless the labelling issue is resolved, the public will be kept in the dark about important changes to their food.

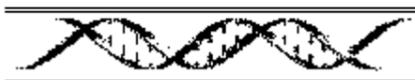
## The Public Demand for Choice

To assess the adequacy of labelling schemes, it is important to understand *why* public opinion is so firmly in favour of labelling.

At the most fundamental level, the rhetoric of market economics is that people should be able to influence the market through what they buy. Consumer choice has therefore begun to be seen almost as a right and labelling as one mechanism through which choice can be exerted.<sup>3</sup>

This has taken on a particular significance with regard to food, which has assumed great cultural importance in the 1990s. Interest in

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food, its healthiness or otherwise and the ways in which it is produced have become major concerns.

This developing interest has also been fuelled by an increasing anxiety about food safety. This has been triggered by a series of scares which culminated in the 'mad cow disease' crisis. A loss of trust in experts and institutions to ensure safety has left the public wanting information about foods upon which they can make their own informed decisions.

The principles of market economics also imply that the consumer may influence *how* their food is produced by the choices they make at the point of sale. Indeed, for many people, it is the *method of production* of GM foods and not simply the nature of the end product which causes most concern. There is considerable unease about the morality of genetic modification *per se* and its potentially damaging effects on the environment.<sup>1</sup> Some of the moral anxiety stems from discomfort with what is often characterised as 'tampering with nature', 'playing God' or as 'dangerous and unnatural'. Altering genetic material and transferring genes between species in ways which could never have occurred naturally raise concerns about the justification for taking such actions, where it might lead and the impossibility of controlling the development of the technology.

Lessons have been learned from other technological risks such as those associated with the nuclear industry. Estimates of the harm of low level radioactivity have been regularly revised upwards. Secrecy has surrounded accidents and the inability of science to predict outcomes heightens public disquiet. In the case of genetic engineering, the nature of the risks is unquantifiable and any resulting damage to the environment would be largely irreversible.

It is clear then that public demand for labelling derives not only from the prevalent political ethos of market economics but also from a complex set of other factors. These include trust, the usefulness of, and justification for, GM foods and moral doubts about the technology itself.<sup>4</sup> It is also influenced by concerns over safety, both in terms of human health and potential damage to the environment.

Failure to meet demands for the labelling of genetically modified foods will fuel an already pervasive sense of mistrust and leave the public with the suspicion that there is something to hide.

### Responses to Demands for Labelling

There have been both negative and positive responses to demands for labelling GM foods. The strongest opposition has come from those companies actually producing the new crops and from certain political leaders, especially in the US. Support, albeit limited in scale and extent, has come from businesses involved in food production and retailing and from some politicians. This has resulted in the introduction of limited labelling schemes.

### Towards a Solution

The already widespread introduction of GM foods and the current position with regard to labelling may give rise to the assumption that *limited* labelling is the best that consumers can hope for. This is not the case. Other European legislation could be used to help food producers and retailers provide comprehensive labelling and the choice their customers so clearly want.

In 1998, discussions have begun on the Commission's proposals to revise the Deliberate Release Directive. This covers the environmental safety of the release of genetically modified organisms and establishes the conditions under which the marketing of both produce and seeds can take place. The Directive *could* be revised to create the necessary conditions for comprehensive labelling by establishing mandatory segregation of genetically modified crops. Without segregation, monitoring for adverse effects will be scientifically meaningless as only very gross and obvious harm will be attributable.

Furthermore, by keeping genetically modified crops and their products separate, it would be possible to enforce a mandatory labelling scheme. Technical debates about whether to use protein or DNA as a trigger for labelling would be unnecessary and, most importantly, the basis of the system would reflect public concern.

Having clear and compulsory segregation would allow a comprehensive labelling scheme to be developed. Because research has shown that the nature of the genetic modification and the species involved are important in the public's evaluation of the technology,<sup>1</sup> any label should carry information on the source of genes and their functions. Labels must also be clear and understandable. Phrases such as 'produced by modern biotechnology' or 'may contain' are clearly unacceptable. Research has shown that the word 'biotechnology' does not mean anything to the public<sup>19</sup> and its use could be seen as intending to conceal the real difference and fuel public feelings of deception. 'May contain' clearly conveys little meaningful information and would be as unhelpful as a label which said 'these eggs *may* be from battery or free range chickens'!

Labelling based on means of production is not new and, in the future, is likely to be one increasingly important way of providing information about what we eat. Companies should recognise that this is increasingly seen as a right if people are to be able to exercise choice in a market economy. It is unfair to label when a company feels it will act in their interest (such as to proclaim a food is high in polyunsaturated fats or uses free range eggs) and to conceal information by resisting labelling when a company feels it may discourage people from buying the product. Supplying ranges of foods which do not contain any genetically modified ingredients and are labelled as such will form an important dimension of providing choice.

Public confidence will only be gained by open labelling and real choice. If this is denied at this stage, industry is taking a hostage to fortune. Who knows what damage may be done to a brand if the public feels deceived by its label?

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*does* contain material from genetically modified organisms and voluntary schemes allow for the labelling of products which do *not* contain genetically modified material. There is clearly a huge difference in the final option presented to consumers according to which of the alternative wordings is used. The use of the word ‘may’ conveys little information to the consumer and if there is post-harvest mixing of traditionally bred crops with genetically modified varieties, almost all foods could be labelled in this way. Hence, there would be no choice at all. The use of the word ‘does’ at least provides some real information but conveys nothing about how and why the genetic modification took place.

The debate over the definition of substantial difference revolves around the issue of whether *difference* should be determined by the presence of either foreign DNA or protein. Essentially though, arguments on either side derive from the continuing battle over the scope of labelling itself. Defining difference as based on the presence of novel proteins alone narrows the scope of what would be labelled because tests for proteins are less sensitive and reliable than DNA tests as an indication of genetic modification.<sup>17</sup>

A meeting of the Standing Committee for Food in January 1998 again failed to come to any agreement on the Commission’s proposal for labelling genetically modified maize and soybean.<sup>18</sup> However, the Commission has now retracted its insistence that protein forms the basis of ‘difference’ and has decided that labels will be used if foreign protein *or* DNA is present. Yet, since neither DNA nor protein remains in the *oil* extracted from soybeans, this exempts soybean oil even though it is found in a large number of food products such as margarine and lecithin, which is used in the manufacture of chocolate.

These technical arguments have occupied the Standing Committee for Food for over six months and two deadlines for implementing the soybean and maize labelling regulation (1st November 1997 and 1st February 1998) have passed without an opinion being given. Delays caused by persistent technical arguments have characterised the labelling debate since the early 1990s and have arisen primarily because the Commission, the biotechnology industry and others who support genetically modified crops have consistently sought to narrow the scope of labelling. In the meantime, those who advocate a much wider scope have become dismayed at the confusion and the dismissal of consumer concerns and have been forced into fighting a rearguard action played out in technical arguments over how and what to label. Meanwhile, consumers continue to have little choice about whether they eat foods containing genetically modified products or not.

In order to ensure that at least some minimal consumer choice is achieved, it is of course important to win technical arguments and establish, for instance, that the presence of DNA as well as protein should be taken into consideration in the assessment of substantial difference. However, such achievements fail to address the underlying problem that the public is not simply concerned about the end product itself but about the *method* of its production.

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On the one hand, therefore, there are those with large financial investments in the technology who have built political support around the rhetoric of jobs and competitiveness and who wish to see the removal of any stigma associated with genetically modified foods. On the other hand are those in direct contact with the public who trade on the provision of choice and variety. If labelling schemes do not have public confidence, it is they who stand to lose most immediately, both in terms of profit and trust.

The arguments *against* the need for comprehensive labelling concentrate on the technical dimensions of the issue and, in particular, on the safety and wholesomeness of the end product rather than the method of production. Influential in the debate has been the OECD’s concept of ‘substantial equivalence’ which is:

*“if a new food or food component is found to be substantially equivalent to an existing food or food component, it can be treated in the same manner with respect to safety”.*<sup>5</sup>

Under this principle, it is the chemical nature of the food which determines whether information, in the form of labelling, is justified. If chemical analysis of the GM food or food ingredient shows it to be no different from, or substantially the same as, the conventionally produced version, no label should be needed on safety grounds and there should be no reason to discriminate against it with a label.

However, this principle leaves some serious safety questions unanswered. Could substantial equivalence discount what prove to be important differences because they are small in scale? An assessment of feeding sheep protein to cattle as a form of protein supplement would probably have passed the substantial equivalence test if compared to other protein supplements, yet the presence of the prion protein proved to be a crucial difference. Although experiments are conducted to assess safety, they are inevitably limited in their ability to give unequivocal proof, as are all toxicological studies which rely on short term studies under laboratory conditions.

But most importantly, reliance on the substantial equivalence test fails to recognise or acknowledge the validity of underlying public concerns about the morality and justification of genetic modification.

Even studies of the ethical issues surrounding labelling have failed to understand the breadth of public concern and tried to reduce the rationale of labelling to one of technicalities. For example, the Polkingthorne Committee, established by the Ministry of Agriculture Fisheries and Food, considered the ethics of labelling foods containing ‘sensitive’ genes such as human genes (because of concerns about cannibalism), pig genes (problematic for certain religious faiths) and animal genes in vegetables (unacceptable to vegetarians). They concluded, having emphasised that the transferred genes were copies and not original DNA, that there is:

*“..no overriding objection which would require the prohibition of the use of organisms containing copy genes of human origin as food” and that “a number of the ethical objections surrounding the use of introduced genes might be removed if the genes were entirely synthetic”.*<sup>6</sup>

**Those with large financial investments in the technology wish to see the removal of any stigma associated with GM foods.**

**Experiments conducted to assess safety are inevitably limited in their ability to give unequivocal proof.**

Focusing on the introduced DNA being a copy and not the original has also led the European Commission's ethical advisers to conclude that this dilutes ethical concerns so that a plant containing a *copy* of an animal gene does not contain animal material *per se*.<sup>7</sup>

During the negotiations in Europe about labelling, UK policy was that labelling of these classes of ethically sensitive foods was needed if they were fresh and not processed.<sup>8</sup> The suggestion was therefore that degrading DNA in cooking or by other means removed ethical concerns even more completely than relying on the rationale that copy DNA was ethically neutral.

Comparing these sorts of official attitudes to labelling with the basis of public demands for labelling exposes a serious mismatch. The official framing is considerably narrower and fails to address public mistrust and concerns over the ability to control the risks and the justification for taking them. Furthermore, for many people it is the very process of producing foods through genetic engineering which causes most unease and not the composition of the end product itself.

This mismatch has been identified in other areas of the regulation of genetically modified organisms including environmental protection.<sup>9</sup> There, the serious dislocation between official and public definitions of risk has fuelled continuing controversies. The same problems seem set to arise with labelling.

### Muddled Regulations

The European Union's Novel Foods Regulation (No. 258/97), which came into force in May 1997, was supposed to clarify and ensure labelling of GM foods. However, gaining agreement on the Novel Foods Regulation was difficult and characterised by disputes between the Commission on the one hand and the Parliament and public interest groups on the other. The Commission, which was particularly influenced by a desire to support the whole technology,<sup>10</sup> tried to restrict the scope of the Regulation as much as possible whereas the Parliament wanted the majority of GM foods to be labelled.

When discussions began, the Commission wanted to exclude from labelling requirements those crops which had been genetically modified to improve their agronomic characteristics. Their argument was presumably based on the mistaken assumption that it is only changes associated with the character of the final product, such as shelf life, that are of interest to the consumer. This would have exempted herbicide and insect resistant crops, which form the majority of the first wave of GM foods. The Commission also wanted to exclude genetically engineered enzymes and food additives.

However, the Parliament and public interest groups managed to ensure that, with the exception of enzymes and food additives, the final Regulation included all genetically modified crops within its scope whatever the reason for their modification. Nevertheless, the Commission successfully pressed its case that substantial equivalence or difference should be retained as the test for determining

whether the products of genetically modified crops should be labelled.<sup>11</sup> This was agreed despite the fact that the definition of equivalence remains both technical and contentious (see next section).

Since the Novel Foods Regulation failed to provide explicit details of what should be labelled and how, Member States and companies are being left to decide how to interpret the Regulation. For example, one company, Nestlé, intends to use the words "*modified by modern biotechnology*".<sup>12</sup> In Austria, companies are proposing a label which reads "*produced without the application of genetic engineering*".<sup>13</sup>

In November 1997, the British Food and Drink Federation and the Institute of Grocery Distribution (IGD) announced that, from the 1st January 1998, all major UK food manufacturers will label products containing genetically modified soya as "*does contain genetically modified soya*".<sup>14</sup> The IGD also recommends that the source of genes should only be mentioned if they are ethically sensitive and that "*under no circumstances should negative [sic] claims such as 'free from genetically modified [ingredient]' be used*".<sup>15</sup>

However, as with Nestlé, labels will only be put on products containing the soybean *protein*. *Soya oil*, which has the protein removed in processing, will not be labelled even if it was made from modified soybeans. The differentiation comes from the logic of substantial equivalence - oil from genetically modified soybean is *chemically* the same as that from traditionally bred soybean.

***Soya oil will not be labelled even if it was made from modified soybeans.***

### Technical Confusion

The labelling debate has been even further confused by marketing approval being granted to two genetically engineered crops *before* the introduction of labelling regulations. Monsanto's 'Roundup Ready' soybean has been genetically engineered to be resistant to the herbicide *glyphosate* (Roundup) and is intended for human consumption. Novartis's maize, which is modified to be resistant to the herbicide *glufosinate* and to produce a bacterial toxin which makes it resistant to insect attack, is intended for animal and human consumption in a processed form.<sup>16</sup>

Marketing approval for these crops was granted by the European Union under the Deliberate Release Directive (90/220/EEC), which assesses the environmental safety of genetically modified organisms. However, since maize and soybeans form the basis of many ingredients which are prevalent in processed foods, the labelling issue needed to be resolved, albeit retrospectively. Consequently, the European Commission has had to introduce yet another regulation to bring the two crops within the scope of the Novel Foods Regulation.

During 1997, the European Commission's Standing Committee for Food has been advising on how genetically modified corn and soybean should be labelled. However, two fundamentally important issues remain unresolved. The first is *what* should be stated on the label and the second is how to define substantial *difference*. Commission proposals would permit the label to say that the food either *may* or

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