

## Chapter 17

# DISCUSSION AND CONCLUSIONS

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When this project was conceived early in 2004, shortly before after the enactment of EU Regulation 1829/2003 which henceforth required the labelling of GM-derived ingredients in foodstuffs (1), there was a widespread expectation (including pronouncements by some government ministers [2]) that more and more genetically-modified (GM) products would be offered for sale in the supermarkets and grocery shops of Europe (3). That accordingly seemed to be the right time to observe the appearance in European food stores of the new GM-products together with consumers' reactions to them; and, indeed, to fair a degree, that is just what happened.

Soon after the project began on May 1st, 2006 it became clear that while some of the predictions had been fulfilled, others had not. Before the enactment of EU 1829/2003 there was no obligation for food manufacturers and suppliers to indicate the presence of GM-ingredients on the packaging and very few had done so. Some retailers had announced specifically that they were removing GM-ingredients from the own-label products (see Chapter 16, page 16-1). It was left to private organisations (NGOs and others) inclined to do so to attempt to identify products containing the GM-ingredients and make the facts known to the public. For a period Greenpeace, for example, ran "Trolleywatch" which, on their website, listed GM-products they had identified in a number of EU Member States. For the countries participating in the present project, Trolleywatch in August 2005 reported the following numbers of GM-products:

Czech Republic	12
Estonia	0
Germany	19
Greece	0
Netherlands	16
Poland	0
Slovenia	0
Spain	0
Sweden	0
UK	2

The Trolleywatch service has since been discontinued (4) but, because of mandatory labelling, it should now possible readily to identify products containing GM-material in any ingredient.

Most consumers are probably not aware of the EU regulations in detail. Nor are they likely to be sensitive to the nuances of GM-labelling: thus a cooking oil labelled as "derived from a GM-source" indicates to a consumer that it is GM even though chemically it might be impossible to detect any trace of transgenic material. As far as most consumers are concerned it is the label that matters, not the actual content. Some

commentators have noted how sensitive food manufacturers and retailers are to that fact, commenting that, when they can, producers tend to avoid labelling because “often, labels are interpreted as warnings rather than simply as information about the application of genetic engineering. Many consumers believe that GMO labels are meant to notify of health hazards - and feel ‘on the safe side’ if they choose products without GMO labels” (3). In some countries the food industry has made fairly extensive use of “GM-free” labelling, presumably in response to industry’s perception of consumer attitudes.

Soon after the project had begun, inspection of retail outlets in the ten participating countries showed that several GM-products were consistently offered for sale in the Czech Republic, Estonia, The Netherlands, Poland, Spain and the UK, but not in Greece or Slovenia. In Sweden there was just one product (a beer containing GM-maize) on sale only under very restricted circumstances. In Germany GM-products have appeared in a number of supermarket chains over the years only to be withdrawn soon after.

While the picture for all the countries participating in this project remained fairly but not entirely static for the following two years, there has been enough variety of products generating sufficient sales for the specific objectives of the project to be explored.

### **The target in context**

The primary question has always been: “Do European consumers buy GM-foods?” It was, of course, never expected that any conceivable positive answer could or would apply to all the hundreds of millions of European consumers. The response could be no more than that some people did purchase such foods as a matter of choice or disinterest in the GM issue. In a similar way, some consumers buy kosher or halal or vegetarian products while others do not. The retailer provides the products as a matter of marketing, leaving individuals to decide whether or not to buy. There is no public consultation on ethics or whether or not to do so; it is seen as a normal commercial transaction. But with GM-products there are additional factors: the objections (sometimes vigorous to the extent of vandalism) of special interest groups, the policies of retailers, as they put it, “catering (albeit selectively) to customer demand” as well as the influence of the media and public policy in the different Member States which may actively encourage or discourage a favourable view of GM-products.

### **Approaches to information gathering**

The project was configured to investigate as far as practical:

- what products labelled “GM”, “non-GM” or “GM-free” were on sale in the participating Member States;
- what evidence was there for ongoing sales;
- how both purchasers and non-purchasers responded to questions about attitudes towards these products, and;
- what they would do if they had the opportunity to purchase freely.

In addition there were limited inquiries into what Europeans did when they resided in or visited North America where many GM-foods are on sale, none of them labelled. All this information was set against the background of the public mood as expressed by the media in each country together with major decisions made by the national governments and their agencies.

## **The retail stores**

### *Products on the shelves*

In six of the ten participating countries (Czech Republic, Estonia, The Netherlands, Poland, Spain and the UK), products labelled as containing GM-ingredients were found on retailers' shelves; in the remaining four they were either totally absent (Greece and Slovenia), present only fleetingly before being withdrawn (Germany) or, in the case of Sweden, represented by a single specialist product found only in a small niche market.

In most cases the product was oil or lecithin derived from GM-soya, packaged as cooking or salad oil, or incorporated into a range of products including margarines. A few maize products were found, including popcorn in the Czech Republic, and maize oil and chips/crisps in The Netherlands.

Generally, the GM-labelled foods were sited on the shelves next to related products; in most cases there are non-GM equivalents to the GM-products. There was no special shelf labelling or other overt indication that the product was of GM origin aside from the container label. In the Czech Republic, there appeared to be a consistent price differential between the less expensive GM- versus the more expensive non-GM-cooking oil.

The position in the UK is slightly different. Apart from the occasional appearance of a GM-soya-based salad topping, the only product was two brands of cooking oil from GM-soya, labelled as "vegetable cooking oil" and with its GM-origin noted on the ingredients panel. This product appears to serve a fairly specialised customer base. It was present in both supermarkets and cash-and-carry outlets (often in large drums) as well as in small groceries (in 1 or 2 litre bottles), all mainly in areas with Asian communities.

However, many types of cooking oil from non-GM sources are on sale; soya oil, almost all of which is of GM-origin, constitutes a relatively minor fraction of the total UK cooking oil consumption.

### *Contact with retailers and what they say about GM-ingredients in their products*

The responses of retailers to being asked about their sales of GM-products was variable. In the Czech Republic and Greece it was essentially impossible to elicit information while in Poland requests for personal meetings with responsible officials in any of the retailer chains failed. In Spain things were somewhat easier, in Estonia, Germany (where one retailer actually provided sales data) and the UK easier still,

while in Slovenia invitations to cooperate sent to the three main retail chains were accepted. In The Netherlands there was direct contact with the largest retailer in the country; in Sweden some 14 retail store and purchasing managers were interviewed.

The reasons advanced by some retailers for their reluctance to become involved included “we receive many university proposals; though this is maybe one of the most significant, to maintain equity, xxx understands that, if you can’t satisfy everybody, it’s better not to participate to avoid a comparative grievance” (Spain) and “irrelevant to the current market position” (Greece). Major retailers in most but not all the participating Member States carry policy statements on their websites about GM foods; these have been noted in some of the chapters on the individual countries. In Spain, some retailer websites also provide information about GM-free products. In Slovenia, however, no information about GM-food could be found in any of the supermarkets or on their websites.

Conversations with retailers often tended to include reiteration of the policy messages on their websites. Whether or not formally stated, many subscribe to the rubric that their customers “don’t want” or are “not yet ready for” GM-products and that, until they are, those ingredients will not be included in their own-label products. Little or nothing is said about the presence of GM-ingredients in branded items.

### ***What the manufacturers said about GM in their products***

We have had limited contact with food manufacturers and processors. However, suppliers of edible oils (including GM-soya cooking oil) in both The Netherlands and the UK reported no change in sales trends following the introduction of mandatory labelling in 2004.

### ***What can the data tell us?***

The fact that supermarkets and grocery stores in some countries continue to offer a number of GM-food items indicates that they must be selling. Store shelf space is valuable; products are not displayed for long periods if they do not sell. We therefore conclude that some consumers have for years been buying foodstuffs labelled as containing GM-ingredients, just as those pioneers once did with tomato purée in the UK in the mid- to late-1990s (Chapter 16, page 16-1).

If consumers buy, say, a cooking oil labelled as derived from GM-soya, one may perhaps conclude that they find both soya cooking oil and oil from GM-soya acceptable. Soya oil has probably been the cheapest cooking oil on the market for the past several years but non-GM oil from soya (when available) is much more expensive than the GM-version. GM-rapeseed oil is not available in Europe; if consumers choose to buy rapeseed oil (probably the next up in price from soya oil), is it because they prefer rapeseed oil (taste, cooking properties, etc.), because they want to avoid GM, because they think that a higher price means higher quality – or for some other reason?

What choices do consumers actually face? How nearly equivalent are the alternatives to GM-labelled products which are offered on the shelves and how close are they

physically located to one another? Do we now have anywhere in Europe the situation which prevailed for a while in the UK in the mid- to late-1990s: GM- and non-GM-versions of the same product offered side-by-side on the shelves? Anyone who wanted a can of tomato purée had deliberately to choose between GM and non-GM. In the event, the sales of each were said to have been about equal.

### **A matter of choice**

If they were so minded, there would be no great problem for retailers to offer GM- and non-GM-products in the same store (and some indeed do so) just as they provide kosher, halal and vegetarian foods in stores which also sell pork and other meats. Consumers choose what they want; the presence of thousands of lines they do not care to buy in no way prevents them choosing the relatively small variety of products they do want.

Choice in this matter is unlikely ever to be total. Quite apart from the sensitivity to having any GM-products on sale, it is hardly likely that at any time a food store would offer exactly the same product made from GM or non-GM ingredients (as with the tomato purée) unless (a) it were a whole food such as a corn cob, or (b) the non-GM product was organic. That lack of comparability introduces a further complexity into the evaluation of consumer behaviour and motivation because a customer might wish to avoid GM but not want to pay the high price of an organic product (see the discussion below on the attractiveness or otherwise of “GM-free”), or may positively want to buy organic and (in some future scenario) not care if it came from a GM-source.

### **“GM-free”**

#### *Presence and usage of GM-free labelling*

The use of “GM-free” labels is common or fairly common in the Czech Republic, Estonia, Greece, Poland, Slovenia and Spain but rarer in the UK. In Germany the use of “GM-free” was formerly very restrictive but is expected to become more common in future. GM-free labels are illegal in The Netherlands (the rubric “produced without gene technology” is permitted in special cases) and Sweden (although some products were found labelled in this way) on the grounds that the condition cannot be guaranteed. Such labelling would presumably have more point in the Czech Republic, Estonia, The Netherlands and Spain where a number of GM-products are on sale than in Greece, Poland and Slovenia where there are few or none. It would be interesting to have sales data on parallel non-GM products, one with a GM-free label and the other without, but that was outside the remit of this project.

#### *Non-GM milk in Germany*

In Germany it was possible at one location to question consumers directly about their reasons for doing so immediately *after* they had chosen to buy milk products labelled “GM-free” rather than conventional or organic (see Chapter 9, page 7). Particular attention was paid to purchases of milk because consumers had a choice of twelve varieties of conventional, “non-GM” and organic milks.

The fact of the milk being non-GM was important but more than 80% of the purchasers had other reasons for buying it. One was that consumers normally buying organic milk found the non-GM milk cheaper but, unless they usually bought organic primarily to avoid GM (and it is not at all certain that they did), their reasoning is unclear: organic products presumably have a value for most purchasers other than being non-GM. Price, however, does appear to be a factor for some people. What was more remarkable was the range of reasons given for the various personal preferences, with a goodly number of contradictions in the responses.

This was an instructive exercise; it showed how complex are shoppers' motivations and how relatively simple intentional questionnaires can fail to elicit them.

### *Sainsbury's milk in the UK*

Another instance where (some) more data are available in a particularly interesting context is the milk sold in the UK with the label that the cows from which it came had not been fed GM-fodder (see Chapter 16, page 16-8). It is not clear if many (UK) consumers know that much of the imported animal feed on which the livestock industry depends is GM in origin. Hence it is equally unclear whether those UK consumers appreciated the significance of not feeding such GM-fodder to cows supplying that milk which was sold at a premium. Confusion might have been even greater because some consumers would presumably be aware that organic milk also came from cows fed non-GM fodder.

What is particularly significant is that the "GM-fodder-free" milk, offered in a comparatively small proportion of Sainsbury's stores (we do not know the basis for the choice of stores) was withdrawn after two years. The obvious implication is that sales did not meet expectation or perhaps the price did not cover the additional costs. There is a further question as to whether consumers who might formerly have bought expensive organic milk mainly because of its non-GM implications had switched to a less expensive (and less profitable?) "non-GM" milk when offered the opportunity, so reducing the supermarket's margin. We have been unable to secure answers to these interesting questions.

### **What consumers say – and what consumers do**

*What the barcode analyses demonstrated about what consumers did and how that related to what they said*

An essential consideration in deciding whether or not European consumers buy GM-labelled food is to find out what they actually do when given the opportunity rather than what they say they might – or would do – should such an opportunity arise.

It is clearly not possible observe purchasing behaviour if there are no relevant products. Asking people what they would do about purchasing GM-labelled products brings consideration of that issue to the forefront of their minds. Were they actually just buying their groceries, they might pay no attention at all to whether or not the items contained GM-ingredients. One can set up trial experiments, as some people

have done on occasion, pretending to offer consumers GM-products, perhaps at a reduced price, in order to test how they react (5). But it is not clear that consumers really accept this ruse, particularly as it will be an unusual event for them (very unusual indeed; it would be virtually unique!); they may realise what is going on and frame their responses accordingly. A number of authors have addressed the issue of consumer behaviour with respect to GM-foods (6-10).

The closest to reality we could get in a European context was to compare actual purchases made by consumers with their later responses to questions, without focussing or otherwise bringing to their attention that they may have already bought such items. The GfK exercise enabled barcode analyses of consumer purchases in four countries to be matched directly with their individual answers about intentions with respect to buying GM-foods.

Interestingly, almost no difference was found between buyers and non-buyers of GM-labelled products in the Czech Republic, The Netherlands, Poland and Spain, all of which have a range of foods containing GM-ingredients available in the shops. When they were asked whether they “bought food labelled as containing GM-ingredients”, half of all respondents said they did not buy such products.

Just over 21% and 23% of consumers who actually had or had not chosen GM-foods, respectively, said they believed they had bought GM-products. Even more remarkable is the fact that of the people who did buy GM-labelled foods, 48% said they would not buy such products. Did this represent confusion on their part about what they were buying or a lack of awareness that GM-foods was what they had already bought? Did they not read the labels? If so, was that because they had no interest in doing so? Or had they read the labels but not fully understood them?

The 22.9% willingness to buy GM-labelled foods on the part of non-buyers might suggest there is a potentially significant market for GM-labelled products which has not so far been satisfied because products of interest to them were not available with GM-content. This conclusion is supported by the finding that only one person in five is careful to avoid choosing GM-foods. It might well be the case that the non-buyers did not buy GM-labelled foods because they were not interested in the particular items on offer which did carry GM-labels, so neither a GM- nor a GM-free label would have meaning for them in that context. Had their favoured products been available with GM-ingredients, they might well have bought them.

#### *Questionnaires about food purchases in North America*

The two questionnaires put to Europeans resident or visiting North America (see Chapter 12, pages 12-2 and 12-12, and Chapter 16, pages 16-14 and 16-32) were designed to learn what they actually did as distinct from what they said they might do.

The Polish exercise was the more limited, encompassing 91 responses from 200 questionnaires mailed out on a personal basis to Polish emigrants in the United States (see Chapter 12, pages 12-2 and 12-12 for details). The respondents as a category were atypical compared with Poles in general: (a) they were living in America; (b) all were university graduates, 90% with master’s degrees or doctorates, and with a very

high proportion (63%) of natural scientists among them; (c) 83% bought organic food. Among the respondents, 27% chose GM-food (mainly for health reasons), 34% rejected it (mainly on health and environmental grounds), and 39% appeared indifferent. Thus, 66% would buy GM-food and 34% would not.

The UK exercise cast a wider net by offering an anonymous web-based questionnaire to the academic and other staff, and students, of eleven UK universities (see Chapter 16, pages 16-14 and 16-32 for details). A total of 1,531 responses were received, 962 from women and 659 from men, 1,193 from the 18-40 age group, 287 from those aged 41-60 and 51 from people over 60; 159 were students. Of the total, 91% said they knew the meaning of “GM”, with 56% aware that in North America many foods were GM or contained GM-ingredients without being so labelled. Of those who were so aware, more than 70% made no attempt to identify which products contained GM-ingredients. Those who did seek to identify did so with a view to avoiding them although not many said how they achieved that. Asked whether they bought organic food, 18% replied “often”, 52% “sometimes” and 30% “never”. Surprisingly in view of the other replies, only seven of the 1,066 people who bought organic foods said they did so to avoid GMOs.

### *Focus groups*

Focus groups were held in The Netherlands, Poland, Spain and the UK, countries in which GM-foods are on sale, as well as in Greece, Slovenia and Sweden, where they are not (see Chapter 3).

Awareness of both GM-products and their labelling was not high. In neither group of countries did the focus group participants mention GM-labelling as influencing their purchasing decisions; quality, freshness and value for money were what counted.

The focus groups showed that, when discussing food purchasing habits, GM-food is not a topic uppermost in peoples’ minds. Labelling was regarded as important yet few of the participants actually looked at the labels when buying food. Scepticism about the possible benefits of GM-products and concerns about putative hazards of their use had more influence than statements about actual and potential benefits although there are signs that in future, climate and population restraints to food availability may lead to more accepting attitudes to GM-foodstuffs.

Nor did the focus group participants appear well-informed about genetic modification or to have given it much thought before the focus group meeting. It is not uncommon to hear that information is hard to come by although in practice there is an enormous amount available. One must nevertheless sympathise with the non-specialist confronted both with a wealth of technical material as well as heated argument: with insufficient knowledge and understanding to make a personal judgement, people are inevitably influenced by factors other than the evidence itself. In attempting to judge what they hear, they have to ask themselves: what can I understand, whom do I trust (and why), whom do I not trust (and why)? Empathy or lack of it with people making the arguments, political and other affiliations, the views of family, friends and colleagues – and of course media stories and pronouncements by public personalities – will all influence decision-making with this as with other contentious issues. Some

people are sensitive to health issues, others to environmental considerations, others again to neither. When coming to a conclusion, people will be influenced by a wide range of considerations from which it may subsequently be difficult to detach them no matter what the weight of evidence against their positions.

However, the public debate does seem in some countries to be changing. The focus groups in this study were held before much of the recent upswing in food prices, concerns about a possible global “food crisis” and the many statements by public figures that gene technology must play a part in resolving these issues. We have little data on how and where and whether opinion might have changed as a result of these recent developments.

*What do the data tell us?*

It is always difficult to predict future personal behaviour from expressions of intent in response to specific questions. The topic may be of little interest to responders until brought obviously to their attention via a targeted question. Thus, asked whether they would buy GM-products, people may remember having read newspaper articles or heard discussions on radio and television, and so might be aware that there is a controversy in which one side, but not the other, is raising the prospect of undefined harm. Responders may gain a sense of the reason for the questionnaire from preceding questions: “are you worried about this or that?” coming before “are you worried about GM-foods?” will alert the responders to the questions being about worries, to which responders may feel an obligation to reply in sympathy with the inquiry.

That is very different from buying food as part of the normal routine of life, often a hurried activity with little time or inclination for deep thought about the nature of the products being purchased. Almost everything will already be familiar from earlier purchases so there will be no incentive to begin reading ingredients labels. Consumers seem happy with the concept that food offered in their usual grocery stores is safe to eat, as indeed it is; most people appear to accept that without question.

If a new product appears, or a label is obviously and visibly changed, shoppers might notice and look further. But if an alteration is made in the list of ingredients it is unlikely that it will register with most people because only rarely do they consult that list. Without a current furore about GM-labelled products, most consumers appear not give them a thought. It is precisely for that reason that pressure groups anxious to prevent sales of such foods do indeed try to provoke an outcry to alert people, raise their awareness and heighten their concern.

The views expressed in the focus groups during the present inquiry show that concerns about harm from the use of GMOs are voiced when people are questioned directly, with differences between buyers and non-buyers (see Chapter 6). In most countries participating in this project (with Sweden a notable exception), a majority of consumers claimed they were aware of the requirement for GM-products to be labelled (Chapter 6) but only half of the respondents claimed that they read the labels. On the other hand, the significant difference found between the answers from buyers and non-buyers of GM-free-labelled-products suggest that buying GM-free is a more

conscious choice.

There are however contradictions. Many people say it matters to them that the products they buy do not contain GM-ingredients. With this in mind one would expect the shoppers to be very careful when buying their food products. Yet when asked how careful they are to make sure to avoid GM-products, many say they are not careful. In the UK, for example, 48% replied that they cared whether their food contained GM-ingredients (see Chapter 6, page 6-11) yet the only food so labelled which is relatively widely on sale is soya cooking oil: do consumers really take care not to buy GM-labelled products (plural!) when there is only one on sale? How great is the demand specifically for cooking oil derived from soya compared with oils from other sources?

It is more instructive – and a more reliable indicator of shopping behaviour – both to observe what is on sale in the shops and to ask people what they actually did, not what they would or might do in circumstances which do not in fact prevail. A clearer picture then emerges:

- (a) in six of the ten countries in this survey, labelled GM-products have been on sale for several years in a range of grocery outlets and show no sign of being withdrawn. The fact of their labelling enables concerned shoppers to avoid them if that is their inclination. Nevertheless, while we have not been able to secure actual sales data, it is clear that the products continue to be on offer in spite of pressure for space on the shelves; they must therefore be worth stocking because consumers buy them in sufficient quantities to meet commercial shelf requirements.
- (b) the barcode survey of consumer purchases confirms explicitly that in the Czech Republic, The Netherlands, Poland and Spain people bought identifiable GM-products. In none of those countries did buying GM-food appear to be much of a concern for shoppers: there was no difference in the questionnaire responses between buyers and non-buyers of GM-labelled-products; only one person in five claimed to avoid GM-foods; no more than a minority regularly read labels.
- (c) the questionnaires posed to Poles in the US, and to Britons visiting North America, show that most, while aware of the prevalence of unlabelled GM-products in Canada and the United States, took no steps to identify and hence no steps to avoid them. Some people said they did try not to consume them but remarkably few chose or were able to say how they had done so. It is again clear from these limited population samples that many, perhaps most, Polish and UK consumers who visit North America have little or no concern about buying and consuming GM-foods: if they want to buy certain foods on the shelves, the fact that they may or may not contain GM-ingredients is irrelevant.

Hence, we conclude that, given an opportunity to buy them, many Europeans are indifferent to the presence of GM-ingredients; in some countries “many” might indeed equate to “most” consumers. We cannot at the present time go further because all Europeans live in countries where the range of GM-products is limited and large numbers of people have no access at all. Until there are more products, more widely

distributed it will not be possible to be absolutely sure how consumers will react to them.

### **The political background and what the media were saying**

*Do these factors influence the public view?*

It is in the UK that the most obvious changes in attitude appear at present to be taking place.

Since early 2007, the media in general have swung from an attitude broadly opposed to GM-crops and -foods to one broadly supportive. Until the early spring of 2007, unfavourable reports were twice as common as favourable ones; the trend has turned the other way. In June 2008, for example, reports were running between 2:1 and 4:1 in favour; in July there was hardly any anti-GM reporting at all. At the same time, government ministers, and their top scientific advisers as well as a parliamentary committee are explicitly favouring consideration of GM developments (11-14).

Although such a substantial change of mood seems largely confined to the Czech Republic and the UK, there is also some degree of movement towards more favourable positions reported from Estonia, Greece, The Netherlands and Poland, but little or no change in Sweden. It is a clear that at both the official and media levels a number of conflicting currents are to be found in Europe.

*What effect will changes in media (and government?) attitudes have on public attitudes and behaviour?*

Responding to present and anticipated rises in food prices, news of shortages of some major products around the world, statements by government ministers and changes in media attitudes, reports are beginning to appear of members of the public becoming more willing to consider GM-foods. As always, whether the public mood is really changing or whether it is the media choosing to publish more pro-GM statements is not clear; perhaps some of each. So far the signs are no more than indicative but if, as seems probable, the economic pressures continue it is likely there will be progressively further movement of public opinion.

As far as the availability of GM-labelled food and consumer choice is concerned, the gatekeepers are the retail stores, and particularly the large supermarket chains. At the present time, many have stated their policies of excluding GM-ingredients from their own-label products without, however, also doing so for branded items. At the time of writing there is only one labelled GM-product (soya oil) at all widely available in the EU, with one or two additional minor products occasionally to be found. But there are early signs of change in retailer willingness to consider the use of products of GM-origin in their own-label products. Food manufacturers producing branded items are voicing similar thoughts (15). The clearest statement was made by the Managing Director of Waitrose, a major UK supermarket chain which is among the foremost promoters of organic foods and the first in 1999 to remove GM-products from their own-label items. In a BBC interview in October 2007, Mark Price (see Chapter 16, page 16-60) said explicitly that his company was thinking about GM – and he said so

again in a subsequent radio interview so it was presumably not a slip of the tongue. There have been other remarks along similar lines. Will UK retailers take the plunge? Will they do so in concert, or one or two at a time? When, if ever, will that be? And what effects might there be in other countries if they do so?

### **What the future may hold**

*Will Europe segment more than at present?*

Two major factors are likely to influence GM-foods in European food stores in the coming months and years.

The first is the movement towards more acceptance which appears to be fastest in the UK although that country has few products on sale at present. We already have the phenomenon of The Netherlands and the Czech Republic offering a number of GM-labelled products, both adjacent to countries where there are few or none. The segmentation of retail food markets between nations is well established; if any country wished to use more GM-products than at present, even many more of them, that need have little or no effect on neighbouring countries except for manufacturers who export having to be more careful where they sourced. Single market or not, the EU Member States could maintain different levels of GM acceptability at least for a period. However, forces acting upon the UK to be more accepting of GM-products is likely also to affect the other countries of the EU to a greater or lesser extent.

The second is imported animal feed. Member States import large quantities of soya and other products for animal feed. The major exporting countries are Argentina and the US (where the proportion of GMO-content is high at 98% and 94%, respectively), and Brazil; there the proportion of GMOs is estimated to be approaching 64.7% (16-18) rising to close to 100% expected over the next few years as the trait is introduced into more and more of the tropical strains growing in the north (19). European food and feed companies have hitherto been able to import commodity quantities of non-GM-soybeans from Brazil but this is expected to become increasingly difficult as the GM-trait extends ever further north, with premiums rising as a result. Soybean meal produced from EU crops accounts for only 2% of the total 36.5 mln tonnes used in the EU. In addition, a further 3 mln tonnes is not labelled as containing GM (i.e. the GM-content is below 0.9%). The remaining 33 mln tonnes is soybean meal imported directly or produced within the EU but from soybeans themselves imported into Europe and labelled “may contain genetically modified organisms”.

Humphrey Feeds, a UK poultry feed supplier, predicts: “We will run out of non-GM-soya either April 2009 or April 2010. Increasingly more GM-soya is being grown in Brazil because the price demand from consumers has been insufficient. Therefore, we *will* run out. One way or another, the GM issue cannot be ducked for much longer” (20). Yet another report (21) by the EU feed industry calls for more GM-soya approvals.

Thus most European consumers, except for those strictly vegetarian or consuming only organically-grown animal products, have by their purchases of meat, eggs and dairy products already accepted, wittingly or unwittingly, that GM-products form a significant part of their food chain.

Problems for the European meat industry will arise in the next year or two because the producer countries will progressively adopt new GM-soya strains not yet approved in the EU. The EU's zero tolerance of unapproved GM-strains means that a shipment found to contain any trace of them will be denied entry to EU ports. Yet it will be virtually impossible for shippers in exporting countries to ensure a total absence of the new GM-varieties in their shipments. Moreover, freight rates are now so high that, if such a shipment is rejected and has to be returned to the exporting country, the aggregate shipping costs will be almost as high as the value of the soybeans themselves.

Under those circumstances, exporters will become increasingly unwilling to export soybeans and soybean meal to the EU – and risk rejection of their shipments – until such time as the new strains are approved; but EU approvals are so slow that the time may be far in the future. Moreover, exporters no longer regard the EU market as key; Asian countries willing to accept their (GM-) products can easily take up the slack.

There may therefore be tough times ahead for the European meat industry and for EU consumers. If insufficient animal feed is imported because of these restrictions, meat and meat product production in the EU will fall. Will replacement supplies then have to come from the major world meat producers outside the EU, from those very countries exporting GM-soya whose animals will themselves have eaten the new GM-feed?

### **The answer to the question**

This project set out to determine whether European consumers bought GM-foods. It is always dangerous to give simple answers to complex questions; any answer to this one will certainly not encompass all European consumers. Our inquiries have shown much variety in the ten Member States of our study but nevertheless in a broad sense, the answer is “yes – when they have the opportunity”.

### **References**

1. *Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed.* EUR-Lex (22.9.2003) ([http://eur-lex.europa.eu/smartapi/cgi/sga\\_doc?smartapi!celexdoc!prod!CELEXnumdoc&numdoc=32003R1829&model=lex&lg=en](http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexdoc!prod!CELEXnumdoc&numdoc=32003R1829&model=lex&lg=en))
2. *Germany to greenlight GM Food labeling.* Deutsche Welle.(13.1.2004) (<http://www.dw-world.de/dw/article/0,,1084846,00.html>)
3. *Labelled goods hard to find.* GMO Compass (23.1.2007) ([http://www.gmo-compass.org/eng/regulation/labelling/92.gmo\\_labelling\\_labelled\\_goods.html](http://www.gmo-compass.org/eng/regulation/labelling/92.gmo_labelling_labelled_goods.html))

4. *Trolley Watch; GE food in Europe*. Greenpeace (no date)  
(<http://weblog.greenpeace.org/ge/map.html>)
5. *Gene food – a question of the price?* SÜDWESTRUNDFUNK (13.4.2004)
6. A. Spence and E. Townsend (June 2006). *Examining consumer behavior toward genetically modified (GM) food in Britain*. *Risk Analysis*, 26(3), 657-670  
([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=943263](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=943263))
7. Noussair, C., Robin, S. & Ruffieux, B. (2002). *Do consumers not care about biotech foods or do they just not read the labels?* *Economic Letters*, 75, 47-53.  
(<http://ideas.repec.org/p/pur/prukra/1142.html>)
8. Noussair, C., Robin, S. & Ruffieux, B. (January 2004). *Do consumers really refuse to buy genetically modified food?* *Economic Journal*, **114**, 102-120  
([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=547493](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=547493)).
9. Marks, L.A., Kalaitzandonakes, N. & Vickner, S.S. (April 2004). *Consumer purchasing behaviour towards GM foods in The Netherlands*, in *Consumer Acceptance of Genetically Modified Food*. By R. E. Evenson, Economic Growth Center, Department of Economics, Yale University, Connecticut, USA  
(<http://www.cplbookshop.com/contents/C2223.htm>)
10. Knight, J.G., Mather, D.W., Holdersworth, D.K. & Ermen, D.F. (May 2007) *Acceptance of GM food – an experiment in six countries*. *Nature Biotechnology*, Vol. 25 (5) pp 507-508 (<http://www.nature.com/nbt/journal/v25/n5/full/nbt0507-507.html>).
11. *GM briefing urged rule rethink*. BBC News (21.6.2008)  
(<http://news.bbc.co.uk/1/hi/sci/tech/7466921.stm>)
12. Jenny Percival (19.6.2008). *Government takes fresh look at GM crops*. *The Guardian* (<http://www.guardian.co.uk/politics/2008/jun/19/2>)
13. Fiona Harvey and George Parker (6.7.2008). *Top UK scientist pushes for GM crops*. *Financial Times* (<http://www.ft.com/cms/s/0/2b7de8d6-4b95-11dd-a490-000077b07658.html>)
14. *International Development - Tenth Report*. House of Commons (15.7.2008)  
(<http://www.publications.parliament.uk/pa/cm200708/cmselect/cmintdev/493/49302.htm>); *Genetic modification*  
(<http://www.publications.parliament.uk/pa/cm200708/cmselect/cmintdev/493/49307.htm> - a36)
15. Raphael Minder, Andrew Bounds and Jenny Wiggins (22.6.2008). *Nestlé asks EU to soften line on GM*. *Financial Times* (<http://www.ft.com/cms/s/0/25020ee0-4098-11dd-bd48-0000779fd2ac.html>)
16. *Economic and Environmental Benefits of Biotechnology in Brazil: “The cost of not participating of the technologic development”*. Celeres (no date)  
(<http://bch.cbd.int/database/attachedfile.aspx?id=1550>)
17. *Soybeans*. *GMO Compass* (4.3.2008) ([http://www.gmo-compass.org/eng/grocery\\_shopping/crops/19.genetically\\_modified\\_soybean.html](http://www.gmo-compass.org/eng/grocery_shopping/crops/19.genetically_modified_soybean.html))
18. Danby, T. (8.9.2008). *Brazil uses GMO In estimated 64.7% of 08-09 soy area*. Dow Jones Newswires.

19. Jenny Wiggins (6.6.2008). *Farmers demand U-turn on GM feed ban*. Financial Times ([http://www.ft.com/cms/s/0c10e23e-340a-11dd-869b-0000779fd2ac.Authorised=false.html? i\\_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2F0c10e23e-340a-11dd-869b-0000779fd2ac.html& i\\_referer=\)](http://www.ft.com/cms/s/0c10e23e-340a-11dd-869b-0000779fd2ac.Authorised=false.html?i_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2F0c10e23e-340a-11dd-869b-0000779fd2ac.html&i_referer=))
20. *GM feed in free range egg production: retailers policies are no longer sustainable*. Farming UK (17.7.2008) (<http://www.farminguk.com/GM-Feed-in-Free-Range-Egg-Production-Retailers-policies-are-no-longer-sustainable7946.asp>)
21. Jeremy Smith (16.9.08). *EU feed industry calls for more GM soy approvals*. Reuters