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Chapter 1

BRIEF SUMMARY

Following a decade of argument in Europe, the 2004 introduction by the EU of mandatory labelling for GM foods, the widespread importation into European countries of GM-animal feed, and the rapid development of GM agriculture and products in many parts of the world, it was pertinent to inquire how European consumers respond when offered the opportunity of buying GM-products in the familiar environment of their normal food shops.

In 10 EU countries, surveys were undertaken and retailers consulted to see which GM-labelled- and GM-free-labelled-products were on sale in the different types of grocery stores (see Chapter 3). We then asked what consumers actually did when they had the opportunity of buying GM- or GM-free products, not just what they said they would do. In six of those countries (the Czech Republic, Estonia, Netherlands, Poland, Spain and the UK) GM-labelled-products are currently on sale while in four (Germany, Greece Slovenia and Sweden), in which they are not, products labelled “GM-free” are widely available.

It is clear from checking data of actual purchases against answers to questions about their preferences and intentions *from the very same purchasers*, that most shoppers do not actively avoid GM-labelled-products. Responses given by consumers when prompted by questionnaires about GM-foods are not a reliable guide to what they do when shopping in grocery stores (see Chapter 6).

At the present time the public debate on GM issues in Europe generally is relatively subdued, although markedly more active in some countries (e.g. in the UK in the summer of 2008 and in France earlier that year). When asked about attitudes in surveys or focus group discussions, consumers in several countries raised ethical concerns, and pointed to environmental and health risks; they were generally less aware of possible benefits than of potential hazards (see Chapter 5).

In the participating countries, we looked at the pattern of media reporting (see Chapter 4), observed the political landscape, ran focus groups of consumers (not in the Czech Republic or Estonia) (see Chapter 5), asked retailers for information and recorded products on sale in grocery stores (see Chapter 3). We then ran market surveys comparing individuals' purchasing intentions with their actual behaviour (not in Estonia or Slovenia) (see Chapter 6) and sought responses to questionnaires directed to Europeans from Poland (see Chapter 12, pages 12-2 and 12-12) and the UK (see Chapter 16, pages 16-14 and 16-31) who visit North America where GM-products are widely used. Our findings showed that Europeans buy GM-foods when they are physically present on the shelves.

We conclude that a major factor in governing the purchase of GM-products by Europeans is the decision of retailers to make them available to consumers.

Thus, to the question “Do Europeans buy GM food?”, the answer is “yes – when offered the opportunity”.

EXECUTIVE SUMMARY

Following the 2004 adoption by the EU of compulsory labelling of all food products containing GM-content in any ingredient, it was uncertain how rapidly such products would appear on the shelves of retail grocery stores. They were by then already in growing use for animal feeds.

At the end of 2005, GM-crops were being cultivated commercially in the Czech Republic, France, Germany, Portugal, Romania, Slovakia and Ukraine; labelled GM-foods of one sort or another were on sale in Belgium, the Czech Republic, Estonia, France, Germany, The Netherlands, Poland, Slovakia, Spain, Sweden and the UK.

While at the present time the public debate on GM issues in Europe generally is relatively subdued, it is markedly more active in some countries (e.g. in the UK in the summer of 2008 and in France earlier in that year). However, when asked in surveys or focus group discussions, consumers raised ethical concerns, and pointed to environmental and health risks; they were generally less aware of potential benefits than they were of conceivable hazards.

In the past decade there have been innumerable debates and campaigns about genetically modified crops and their food products. There have also been many polls and some focus groups exploring public attitudes; for all the doubts about their reliability as accurate indicators of public opinion, those studies showed that much, probably a majority, of the public were in one way or another antipathetic to the technology as it applied to agriculture, with views ranging from some vigorously opposed, to most people largely uninterested, to a proportion enthusiastically in favour.

But those tests of public views were theoretical along the lines of “what would you do if you had the opportunity of buy GM-products?” There have been one or two small-scale experiments in which limited numbers of consumers were offered a product in two forms (actually identical), one labelled “GM” and the other “non-GM”, usually with a price differential in favour of GM. Never until the present project, as far as we are aware, have explorations been made of what consumers actually did when shopping for food in their normal way in familiar stores *which offered food labelled as containing or being derived from GM-ingredients* yet without the consumers’ attention being specifically drawn to that fact. It would be up to them, if they were interested, to find out by reading the labels and deciding for themselves what to do.

Using seven pillars, the CONSUMERCHOICE project “Do European consumers buy GM foods?” explored public attitudes in the Czech Republic, Estonia, Germany, Greece, The Netherlands, Poland, Slovenia, Spain, Sweden and the United Kingdom by asking in various direct and indirect ways *what people actually do in grocery stores, not just what they say they might do*:

Pillar 1: questions put to the management of supermarket chains and to small shopkeepers sought information about GM-products on sale and the responses of consumers to their presence; in some cases information was asked about specific forms of GM-free labelling (see Chapter 3);

Pillar 2: repeated visits to a variety of food stores (from large supermarkets to corner stores) in major cities, large towns and small settlements/villages recorded the presence on the shelves of food products labelled as containing GM-ingredients in those countries where they are sold, and of labelled as “GM-free” in countries where that label is popular (see Chapter 3);

Pillar 3: analysis of the print and broadcasting media showed that, across the ten countries participating in the CONSUMERCHOICE project, the average frequency of articles was low, most of them being news reports (see Chapter 4); media interest in GM-food and related issues appeared limited in most countries. However, specific national or local events did evoke greater responses, mirrored for a short period of time by an increased number of articles and reports. Overall, the results make it clear that the public debate on GM-foods in the majority of participating countries was subdued.

Moreover, in most countries during much of the period of the project, the majority of published items were neutral or negative with respect to GMOs. However, it became increasingly clear beginning in the spring of 2007 – and gathering pace in the spring of 2008 – that an upsurge of interest was taking place, accompanied in some countries, especially in the UK but also to a lesser extent in Estonia, The Netherlands, Poland and elsewhere, by a remarkable change in the balance of reports on GM; favourable views became much more common, in some Member States constituting a clear majority (see Chapter 4 and Chapter 16, pages 16-10 and 16-25 *et seq.*). Some of this renewed interest was no doubt driven by the recent global rises in food prices, reinforced by reports of actual food shortages in many of the poorer countries and supported by claims and comments that GM-technology might contribute to lower food prices and to a resolution of what some people are calling a “world food crisis”.

Pillar 4: in eight of the ten participating countries, comparisons were made of actual purchases by members of a consumer panel (derived from an analysis of product barcodes) with their opinions and perceived behaviour as expressed via a focussed questionnaire (see Chapter 6). In addition, personal interviews with shoppers in some German supermarkets were able to pose specific questions (see Chapter 9, page 7 *et seq.*);

Pillar 5: responses of focus groups in some of the countries were explored with respect to matters relating to GM-foods (see Chapter 5);

Pillar 6: for Poland, a questionnaire about responses to the unlabelled presence of GM-ingredients in many foods in North America was answered by about 100 Poles now permanently or temporarily resident in the United States and Canada (see Chapter 12, pages 12-2 and 12-12);

Pillar 7: a questionnaire answered anonymously by more than 1,500 UK residents who are staff and students in eleven UK universities and who have visited the US and Canada in recent years, asked about their responses to the presence of unlabelled presence of GM-ingredients in many foods in North America (see Chapter 16, pages 16-14 and 16-31);

As supporting background information, there was an extensive analysis of media items relating to agricultural biotechnology and GM-foods, predominantly in the period July 1st, 2006 - March 15th, 2008. For each participating country, the number of media items per month was noted together with an evaluation of whether items were generally favourable, unfavourable or neutral towards the technology and its products. These data were correlated with major items of gene technology interest as they occurred in each country during the 21 months of media scrutiny and analysis (see Chapter 4).

Findings

1. The willingness of supermarkets to discuss the GM issue varied between individual companies as well as between countries. In the Czech Republic, Greece and Poland there was great hesitation in discussing any aspect of the issue. In The Netherlands companies were relatively relaxed, while in the UK some were quite willing to provide information and had no objection to its being published and attributed but others would do so only reluctantly and in confidence. Owners/managers of corner shops showed less reluctance. In Sweden, all supermarkets willingly answered all the questions put to them.

Some supermarket chains carried notices on their websites proclaiming that their own-label (private label) products were devoid of GM-content. On the other hand, there were also supermarkets with website statements in which they did not necessarily exclude the presence of GM-ingredients in their own-label products. Some chains noted that, unless they were labelled “organic”, their meat, dairy products and eggs did derive from cattle provided with GM-feed (but see below). Branded products were excluded from the requirement to be GM-free; there are also one or two retail food chains in which essentially all the products are own-label and hence all GM-free.

It became clear that some large supermarket chains did not track centrally all the GM-labelled items that might be on sale. Nor were small shopkeepers usually aware of the (transgenic) provenance of some of the products in their stores. However, none of them, large or small, reported any consumer reactions whatsoever.

A “GM-free” label is quite common in some countries (e.g. Poland, Germany) but prohibited in others (e.g. The Netherlands). In Sweden there were many products labelled “GM-free” although such labels are in fact not legally permitted. Two interesting examples of its use were by German and UK chains which introduced milk from cows fed non-GM-fodder, and which carried a label to that effect.

2. In those countries in which GM-labelled-foods were on sale, most were oils from GM-soya sold either as cooking oil or incorporated into other products such as margarine; however, some oil and other ingredients from GM-maize were also on sale. The number of different labels varied; in Estonia there were nine brands of GM-oils, in the UK only two; this probably reflected organisational differences among the supplying firms in different countries, and whether the items for retail sale were bottled and labelled domestically or imported from elsewhere. There appeared in some countries to be market segmentation for oil derived from GM-sources compared with oils from other sources.
3. Whatever they may have said in response to questions, most shoppers did not actively

avoid GM-products, suggesting they are not greatly concerned with the GM issue. Moreover, it is clear that, as far as buying GM-foods is concerned, the way people respond to prompting via questionnaires and polls is by itself not a reliable guide to what they will buy in a grocery store. In countries in which they are widely used, a “GM-free” label on the front of a package is more likely to influence shoppers than a “containing-GM” label in small print on the back.

4. Focus groups studies showed that GM-food is not uppermost in people’s minds when discussing food purchasing habits. Labelling was demanded by the participants yet few of them actually looked at the labels when buying food. Sceptical arguments were more dominant than consideration of benefits but it seems likely that, in the future, climate and population restraints to food availability may lead to more accepting attitudes towards GM-foods.
5. Attitudes towards GM-foods by Poles in North America: 91 questionnaires were returned out of more than 200 sent out. Of those who responded, 92% agreed that they knew the meaning of GM-food; 21% chose GM-food, 26% rejected it while 46% were indifferent.
6. The UK questionnaire was offered anonymously to the staff and students of eleven UK universities; 1,531 responses were received from all parts of the UK, from men and women, from people in the 18-40 age brackets as well as those aged 60 and over, with educational levels from high school to doctorates, and living in large towns, small towns and villages. Of those responding, 91.4% knew the meaning of genetic modification, 3.0% did not and 5.6% said they were unsure.

Asked whether they aware that in North America many processed foods and some whole foods are GM/GE or are derived from GM/GE sources, and are not labelled to show that, 55.8% said they were aware and 44.3% were not. Of those who are aware, 28.7% sought to identify products containing GM-ingredients, mostly (93.6%) in order to avoid them; 71.3% did not attempt to identify GM-containing products.

7. The German retailer who supplied CONSUMERCHOICE with the sales data on “GM-free” milk agreed to ask his customers why they purchased one or more of the seven varieties of milk carrying such a label. It is clear that, for 20% of consumers, the “GM-free” label was a strong motivation but more than 80% of the respondents had other reasons for buying the products.

Conclusions

1. Apart for personal preferences which we were for the most part not in a position to judge, the main external factor limiting the choice of European consumers with respect to their purchases of GM-foods is availability in the stores.
2. GM-products offered for sale are indeed purchased.
3. Europeans as represented by Poles living in and UK residents visiting North America were largely indifferent to the presence of GM-ingredients in food while they were in the United States and Canada.

4. It is clear that consumers want freedom of choice when buying foods and some of them say “yes” to GM when offered that freedom.
5. Overall, people seem not to be able to recognise GM-food in spite of the labelling requirements. But this does not appear to be a problem as people are in general are not careful to avoid these products, a conclusion supported by the scant attention paid to labels. However people do react differently towards GM-free-labelled products, suggesting that those products are chosen with greater thought on the part of consumers who want them.
6. In practice, shoppers frequently behaved differently from the way they say they would do. One third of the respondents were wrong in their perceptions about their GM-purchases while another third did not know what they had bought.

Chapter 2

INTRODUCTION

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Consumers in several EU countries are able at the present time to purchase GM-food products. This study was accordingly designed to compare actual consumer behaviour with purchasing intentions expressed in response to opinion polls and questionnaires.

There is one very important point to note at the outset: from the average consumer's perspective, the only way of knowing whether or not a product contains GM-ingredients is to look at the label. Consumers cannot be expected to know how various foodstuffs are compounded or of the intricacies of EU and national regulations. Thus, we have focused our attention on products which carry GM- (or GM-free) labels without concern about whether a product such as GM-cooking oil contains any detectable trace of a GMO-origin. As far as the consumer is concerned, the label says it all.

Nor have we paid attention to products (such as vegetarian cheese) produced *with the aid of* materials (chymosin in that case) from a GM-source but *do not contain* GM-ingredients. EU regulations distinguish between these cases, obliging the latter to carry a label but not the former. The average consumer cannot be expected to know about chymosin from genetically modified microorganisms used for the preparation of some cheeses and we have therefore ignored such materials.

The prime strategic objectives of the study were to:

- determine the real attitudes of European consumers towards GM-foods by observing their actual purchases when they were given the opportunity;
- note GM-products offered for sale and how customers are informed by labelling, price, supplementary information, position and prominence on the shelves;
- supplement the findings with specific polls and focus groups;
- provide reliable evidence of genuine consumer GM-food choices to food chain stakeholders to help their future planning.

The exercise of consumer choice with respect to GM-foods has implications both along the food chain and for restaurateurs, schools, hospitals, residential institutions, research activities, nutritional advisers, food journalists and policy-makers.

Published opinion polls have hitherto offered a variable picture of European consumer attitudes. Some have shown many consumers to be against GMOs. Other evidence suggested little real interest: when offered products labelled "GM" at a favourable price, consumers tended to buy. One question therefore was whether opinion polls actually provide reliable indications of how consumers would behave when presented with real rather than theoretical choices.

Under EU regulations, food products containing more than 0.9% GM-content in any

ingredient must be labelled accordingly. As the project was being developed, increasing quantities and varieties of GM-products were expected to appear in EU food stores in the ensuing months and years; indeed, some were already on the shelves. The objective was thus to determine what consumers actually do when buying food as distinct from what they say they will do as reported in polls.

The study involved:

1. tracking the introduction and availability of labelled GM-foods in ten Member States;
2. viewing in those countries the actual consumer purchases of GM-foods against a background of published opinion polls of expressed intentions, local public discussions, media reports, and governmental policies and statements;
3. exploring consumer actions and motivations by bar code analysis of purchases accompanied by questionnaires; questions were put to individual shoppers in Germany;
4. asking how Europeans, as represented by Poles and residents of the UK, react to the widespread presence of GM-containing foods when living in or visiting North America;
5. drawing appropriate conclusions about the predictive value of various methods of assessing public opinion and intentions in the light of actual consumer preferences as indicated by purchases.

It was not part of this proposal to conduct general opinion polls on attitudes to GM foods: polling is a highly specialised activity already conducted by experienced pollsters. Nor would it have been necessary to do so; polls on public attitudes to GM-crops and -foods are already carried out fairly regularly, with the results usually available in the public domain. Our specific polls did nevertheless include some more general questions.

Background

The European GMO debate

In the closing years of the 20th century, Europe witnessed a series of disturbing food-related crises and issues. They encompassed cases of deliberate and illicit adulteration, contamination with noxious chemicals from industrial effluents and the involvement of animal diseases, including bacterial infections and bovine spongiform encephalopathy (BSE). In some countries this generated growing scepticism about information, particularly assurances about food safety, deriving from industry as well as from governmental and other official sources. These food problems were the precursors of the great GMO-food debate which remains partly unresolved to this day.

The debate has had a major influence on the European food industry (1, 2). Food legislation has to take into account the growing demand for transparency and traceability, as witness the regulations on GM-food and -feed labelling and traceability (EC1829/2003 and EC1830/2003) which came into force on April 18th, 2004. In autumn 2004, the EC agreed specific operational interpretations of these regulations, with widespread labelling of GMO-containing or derived products starting in 2005.

Applications for the EU approval of new GM-foods became stalled, with the last approvals of novel GM-food products in April 1998. Following the new regulations, the first clear sign of

the moratorium breaking came on May 19th, 2004 with the approval for human consumption of GM-maize (3). The possibility then existed that GM-food products, labelled according to the new regulations, would begin to appear in the food shops in the coming months and years. Some sources expected rapidly growing numbers of GM-food products to be on sale in European countries following the establishment of the labelling regime; they have indeed appeared but perhaps more gradually than initially anticipated. The European Food Safety Authority (EFSA) had already noted that proposal to ban EU-approved GM foods in Austria and Greece as requested by those countries had no scientifically justified basis. The EFSA ruling enabled the Commission legally to challenge these restrictions (4, 5).

Public attitudes towards GM food: theory and practice

It is, of course, impossible to predict how in real life consumers will respond to food labelled as containing GM-ingredients, hence the dilemma for retailers, manufacturers and farmers. Some retailers claim no philosophical objection to offering GM-products but are clearly worried about the effect on their sales or protests by activists, especially if they become the first locally to do so. However, providing products for a minority of consumers with incompatible special requirements presents few problems for retailers: they already do so for patrons with religious requirements or wishing to avoid animal products, while offering other products in the same stores for the bulk of their customers. If they so decided, it could be done in the same way for GM-products.

Formal public opinion polls are carried out at intervals both by the EU (as part of the Eurobarometer series), and by a range of commercial polling organisations and public service bodies such as government agencies and consumer associations.

The Eurobarometer polls and other reports have shown widespread scepticism to genetically modified food (6-12); the arguments and the underlying premises of popular viewpoints have been investigated in qualitative studies using in-depth interviews and focus groups.

Such studies have shown that attitudes to GM-food (and its labelling) are linked to moral, existential and epistemological issues about trust and people's sense of agency. Lay scepticism about GM-foods may be influenced by a lack of trust in the institutions and actors responsible for the new technology (9, 11, 12), or by a lack of a sense of agency (7, 12, 13). In addition, GM-food is sometimes perceived as "unnatural", challenging traditional perceptions of nature and of humanity's place in nature, which may bring about moral objections (12, 13).

Over recent there has been a gradual decline in antipathy to GM-foods and -crops, more so in some countries than in others. Thus, a recent UK study has shown a decline in concerns about GM-foods from 25% in 2006 to 20% in 2007 (14). Swedish consumer opinion polls point to a relatively negative public opinion to GM-foods (15). For 2005, the number of opponents in Sweden is markedly higher than the total percentage of opponents in Europe generally, which amounts to 58%. There are, however, indications that the Swedish negative opinion is not absolute (16). It is plausible that under certain circumstances, e.g. if environmental benefits could be proved, there would be some willingness among Swedish consumers to buy GM-food stuffs.

Although there are national variations, the European public on average tend to be more

sceptical towards GM-food and -crops than to biotechnology for medicine (8). In a Swedish focus group study, for instance, participants explained that they could perceive immediate, personal advantages and consumer benefits from GM-medicine but not from GM-food (13).

Nevertheless, while a high proportion (often a majority) of European citizens have said in one form or another that they opposed GM foodstuffs, sizable minorities did not (8, 17-19). At the same time, most people stated clearly that consumers should have freedom of choice about whether or not to buy GM foods (17).

It is important to bear in mind that questionnaires, interviews and focus group discussions on GM-food have dealt mainly with hypothetical products and scenarios, since clearly labelled GM-products have rarely and mostly only comparatively recently been available on the European market. Together with extensive anecdotal observations, the polls often generate uncertain and conflicting conclusions. Consumers generally may not be so antagonistic as some retailers fear (20-22) and not all food suppliers focussing on non-GM foodstuffs are necessarily successful. For example, sales of specifically non-GM pork by a Danish meat producing group fell far short of expectation (23). But, so far, few food manufacturers and retailers have withstood pressures (mainly from non-governmental organisations [NGOs]) to withdraw GM-labelled products from their shelves (24, 25). Many, perhaps most, large retailers have somewhere on their websites a statement about their policies with respect to GM-products although those pages are not always easy to find; where they have been identified we have referred to them in the chapters focussing on individual countries.

Lay persons' expressed attitudes to GM food products may well differ from their actual choices when such products are available in the stores. Moreover, whatever form consumer reaction takes to the presence of GM foods in the stores, public discussion is conducted in the context of government decisions, media news items, discussions, articles and presentations, as well as a range of activities by scientific, civic and industrial bodies, and by NGOs. No matter its ultimate origin, most members of the public acquire their information on GMO topics from the media; what the newspapers and magazines print – and the broadcasters say – is obviously important.

A matter of price?

In the spring of 2004, customers in a German city were offered “pretend” GM bread in a bakery and French fries at a lunch counter. The products, labelled as containing GM-ingredients (although they did not), were offered for sale at reduced prices alongside their “non-GM” equivalents (which were, of course, identical). Four times more of the cheaper “GM”-loaves and over 20 times more of the “GM”-fries were sold compared with the “conventional” variety (22). An experiment with asparagus revealed similar results. In the UK, an experiment showed that a total of 28% of the customers are willing to buy GM-breakfast cereals at equal or at lower prices compared to conventional counterparts (26). Is price thus a (or the) determining factor?

Consumers are curious

Various interesting examples of consumer reactions have been observed. In Sweden, a beer is brewed containing GM-maize grown in Germany (20). It was for a time sold in one of the largest Swedish retailer chains but was withdrawn due to consumer protests. It is now offered in some restaurants and in southern Sweden through the Swedish state-owned liquor monopoly *Systembolaget* (21). This Kenth beer was available for tasting at a stand at the Food and Drink Expo 2004 exhibition in Birmingham in March 2004; passers-by and visitors to the booth were invited to sample it. Of about 2,000 people so invited, only 12 refused on the grounds that it contained a GM-ingredient. In that same exhibition, visitors were asked, as they had been in 2002, to predict when they expected to see GM products in the stores. The period has become shorter, with the overwhelming proportion of consumers expecting GM foods to become part of normal existence in the next 2-5 years. That may have turned out to be somewhat optimistic

Most supermarkets in Member States have so far been very cautious about committing themselves to putting GMO-derived products on the shelves. Nonetheless, at the start of this study there was a widespread expectation that, over the coming months and years, and more readily, no doubt, in some countries and places than in others, such products would indeed appear. Even the German Federal Agriculture and Consumer Affairs Minister Renate Künast, a member of the Green Party and well-known for her antagonism to agricultural biotechnology, said in January 2004: “I reckon that, at the latest, genetically modified corn will appear on European supermarket shelves in the autumn” (27).

A unique opportunity seemed about to present itself to explore some of these consumer uncertainties as the new products appeared on the shelves. With the coming into force of the EU labelling regulations and the necessary refinements for their proper use throughout the EU, consumers have all the information they might reasonably require in order to decide whether or not they wish to consume products containing or made from GMOs.

Investigating consumer GM-food behaviour – a different approach

An unrepeatable opportunity apparently existed of observing what shoppers actually buy when faced with this new choice, rather than what they might have said they would purchase. Such a possible discrepancy between the public opinion polls about GM-foods and the actual behaviour of customers when faced with real choice had not previously been explored.

The proposers of this project thus perceived a unique prospect for a fact-based survey on the sales of GM-labelled foodstuffs as they became available for the first time in ten Member States. Rather than concentrating on what consumers said they might do with respect to buying GM-foods, the study has explored as far as possible what in fact they did do in those countries where such foods were on sale. In Member States with none on the shelves, attention turned to consumer responses to “GM-free” labels. Thus, the presence of labelled products on the shelves, sales data, the recorded purchasing behaviour of customers, published material combined with our own surveys of opinion using a poll and focus groups together offer a view of the real attitudes of consumers in a number of countries towards foods containing ingredients derived from GM-sources. This information will be of wide interest to all those involved in the food chain: consumers and their associations, retailers, restaurateurs, food manufacturers and farmers, as well as lawyers, politicians and journalists. They will provide the European Commission and the EFSA with feedback about

the implementation and practicability of GMO labelling, will painting a picture of real consumer sentiment on the basis of behaviour and in the climate of ongoing public and media discussions.

The findings are an important indicator to the European food industry, crop breeders, researchers, journalists, consumer organisations and policy makers about the way GMO-products are perceived and dealt with. They may help to inform the wisdom of the strategy pursued by some food companies of avoiding GM-foodstuffs – and hence labelling – or they might stimulate re-consideration and allow the European food industry to realign and become more competitive in the future. Either way, a signal will go back from fork to farm, with obvious consequences for European agriculture.

References

1. Grant, D.R. (2004). *A Farmer's Observations on Genetically Modified Food in Europe*. Eisenhower Fellowship Report (to be published at <http://eisenhowerfellowships.org>)
2. *Chronology of EU's ban on gene crops and foods* (http://biz.yahoo.com/rm/040426/food_eu_gmo_chronology_2.html)
3. *EU Institutions Press Releases. Commission authorises import of canned GM-sweet corn under new strict labelling conditions consumers can choose* (http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=IP/04/66310IRAPID&l=EN)
4. European Food Safety Authority (1 March 2004). *Opinion of the Scientific Panel on Genetically Modified Organisms on a question from the Commission related to the Austrian notification of national legislation governing GMOs under Article 95(5) of the Treaty*. (http://www.efsa.eu.int/science/gmo/gmo_opinions/178_en.html)
5. European Food Safety Authority (22 July 2004). *Opinion of the Scientific Panel on Genetically Modified Organisms on a request from the Commission related to the Greek invoke of Article 23 of Directive 2001/18/EC1 (Question N° EFSA-Q-2004-062)* (http://www.efsa.eu.int/science/gmo/gmo_opinions/506_en.html)
6. Durant, J, Bauer, M & Gaskell, G (eds.) (1998). *Biotechnology in the Public Sphere. A European Sourcebook*. London: Science Museum.
7. Gaskell, G. *et al.* (2000). *Biotechnology and the European Public*. Nature Biotechnology, **18**, 935-938.
8. Gaskell, G., Allum, N. and Stares, Sally (March 21st, 2003). *Europeans and Biotechnology in 2002; Eurobarometer 58.0* (2nd Edition) (http://europa.eu.int/comm/public_opinion/archives/eb/ebs_177_en.pdf)
9. Grove-White, R., Macnaghten, P., Mayer, S. & Wynne, B. (1997). *Uncertain World. Genetically Modified Organisms, Food and Public Attitudes in Britain*. The Centre for the Study of Environmental Change. Lancaster University: Lancaster.
10. Grove-White, R, Macnaghten, P & Wynne, B. (2000). *Wising Up. The public and new technologies*. The Centre for the Study of Environmental Change. Lancaster: Lancaster University.
11. Marris, C., Wynne, B, Simmons, P & Weldon, S. (2002). *Public Perceptions of Agricultural Biotechnologies in Europe. Final report of the PABE research project*. (<http://www.pabe.net>)

12. Wagner, W *et al.* (2001). *Nature in Disorder: The Troubled Public of Biotechnology*". In: Gaskell, G & Bauer, M (eds.) (2001). *Biotechnology 1996-2000: the years of controversy*. London: Science Museum.
13. Wibeck, V. (2002), *Genmat i fokus. Analyser av fokusgruppssamtal om genförändrade livsmedel* (Modified Food in Focus. Analyses of focus group discussions). Diss. Linköping: Linköping Studies in Arts and Science, 260.
14. *Consumer Attitudes to Food Standards: Wave 8. UK Report Final*. Food Standards Agency (24.2.08) (<http://www.food.gov.uk/multimedia/pdfs/cas2007ukreport.pdf>)
15. Gaskell, G. *et al.* (2006). *Europeans and Biotechnology in 2005: Patterns and Trends*. Eurobarometer 64.3. (http://www.ec.europa.eu/research/press/2006/pdf/pr1906_eb_64_3_final_report-may2006_en.pdf)
16. *Attitude surveys on gene technology and food* (2007). The Consumer Organisation Stockholm (http://www.konsumentforeningenstockholm.se/upload/Konsumentfrågor/SKOP_genteknik_sep2007_rapport.pdf)
17. KRC Research (January 2003). *European views on agricultural biotechnology. An overview of public opinion*. (http://abeurope.dynamicweb.dk/images/files/Public_opinion_overview_on_biotechnology.pdf)
18. KRC Research (December 9th, 2003). *Press release: GMOs - Public opinion survey results reveal flux in the debate* (http://www.europabio.org/pages/ne_140404_t_1.asp)
19. *Consumer Watch Report Series - GM Food* (August 2003). Institute of Grocery Distribution (<http://www.igd.com/ConsumerWatch.htm> - Aug03)
20. *Première for GM foods in Sweden* (<http://www.foodoresund.com/composite-347.htm>)
21. *Europe prepares for pull of GM lager*. Independent on Sunday (July 11th, 2004) (http://enjoyment.independent.co.uk/food_and_drink/news/story.jsp?story=539985)
22. *Gene food – a question of the price?* SÜDWESTRUNDFUNK (http://www.swr.de/plusminus/beitrag/04_04_13/beitrag4.html)
23. *Danish Crown stopper GMO-frit kød*. Internetavisen Jyllands-Posten (30 June 2004) (<http://www.jp.dk/erhverv/artikel:aid=2494384>)
24. *Sainsbury's cowed into non-GM milk*. The Times (1 June 2004) (<http://www.timesonline.co.uk/newspaper/0,,171-1129941,00.html>)
25. Langelüddeke, P. and Deichmann, T. *Was Konsumenten wollen müssen*. Aktuell (6 July 2004) (<http://www.gruene-biotechnologie.de/inhalte/deichgreenpeace.html>)
26. Moon, W. and Balasubramanian, S.K. (2004). *Is there a market for genetically modified foods in Europe? Contingent valuation of GM and non-GM breakfast cereals in the United Kingdom*. AgBioForum, vol 6, number 3, article 6 (<http://www.agbioforum.org/v6n3/v6n3a06-moon.htm>)
27. *Germany To Greenlight GM Food Labeling*. Deutsche Welle (13 January, 2004). (http://www.dw-world.de/english/0,3367,1433_A_1084846_1_A,00.html)

Chapter 3

SURVEY OF LABELLED GM- AND GM-FREE- PRODUCTS ON SALE

Jaroslav Drobnik
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Helena Stepánková

Introduction

The objective for this part of the project was to record GM-foodstuffs on offer for sale in European groceries. The project participants were looking for co-operation with and receiving information from retailers about sales; they would also make their own sample surveys in a limited number of retail stores, checking for the presence of possible GMO-containing foodstuffs and noting the form of labelling, publicity and location on shelves.

Methodology, problems and modifications

Retailers were asked via a formal letter for a short interview. The project participants wished to inform them about the aim of the CONSUMERCHOICE project and their intention to log data on introduction of GM-foods on the European market. The priority was to determine what European consumers can actually find on sale but labelling, wording of labels, prices, and location on shelves were also important. A schedule of relevant questions was agreed by the project participants.

The reactions of supermarket chain managements to formal letter asking for their co-operation were variably positive in Estonia the Netherlands, Slovenia, Spain, Sweden and the UK, with some response also in Germany. Polish and Czech managements ignored the requests or promised an interview and then failed to deliver it. However, retailers in Greece, The Netherlands, Spain and the UK post statements about GM policy on their websites.

Such a lack of full cooperation was always anticipated as a possibility and the project methodology was modified accordingly. Policy statements were obtained from the websites of major retailers; assessments of products on sale became more dependent on in-store surveys.

Surveys of labelled GM-foods were conducted in various regions of each country, in small, medium and large towns, and in corner groceries as well as the larger supermarkets and hypermarkets (Table 1). Attempts were made to determine whether and how GM-foods were presented to consumers: how consumers were informed, whether there were special pricing policies for GM-foods and how food manufacturers labelled such products. Thus, we noted brands, manufacturers, styles of labelling, wording, positions of label on packages and the placement of GM-goods on the shelves as well as their prices and a rough quantitative comparison of GM-brand similar products derived from non-GM sources.

A similar approach was used for products labelled as “non-GMO”, “GM-free” or other wording for negative labelling.

In order to explore possible trends, data were divided into two groups: those collected in May 2006 - April 2007 and those in May 2007 - May 2008. With the experience gained from surveys in the first period, we eliminated some evaluation criteria because the prices and positions of products on the shelves were clearly not important. We also reduced the number of towns and shop visits. Results from the later period showed some changes in labelling, and manufacturers and retailers' policies towards GM-foods, as well as in the range of such products available on the EU market.

GM- and non-GM-labelled products in the European Union

A variety of conditions prevail in the various countries of this study: different national policies, cultures, attitudes to food and to innovation, influence of the environmental and organic lobbies and the impact of religion. The methods and approach were adapted to meet such dissimilarities:

- retail store visits were carried out in both project periods in all the participating countries except for Greece. The Association of Greek Retailers published a statement in March 2006 informing consumers that they are against GMO-products and would never allow them in their shops;
- GM-labelling in the earlier and later periods of the project was compared to identify changes and trends (Table 1, column 2). In most cases, no changes in retailers' GMO policies occurred except in the Czech Republic where labelling of cooking oils and many other products were altered. The former bold labelling of oils derived from GM-soya was changed to discreet notices using smaller typefaces. The number of products labelled as non-GM increased substantially; such products had not earlier been labelled. These new non-GM labels are often displayed prominently on the front of the package;
- products were sought in different distributions of retail stores in the various countries, reflecting the varying patterns of retail sales. In some countries participants visited shops in large cities, middle-sized towns or villages, with the total number of sites variable between countries: it rapidly became clear for some Member States that, while the range of products offered in retail stores of different sizes and serving different clienteles depended on their character and location, the overall variety did not. Only rarely were distinct varieties of products found in a limited number or in specialist shops (Table 1, column 3);
- as a consequence, the number of shops monitored differed significantly. In Poland and the Czech Republic there were 176 and 83 visits, respectively, much more than in other countries having more-or-less the same products everywhere; in those other countries the number of visits ranged from 14-28 (Table 1, column 4);
- the reactions of supermarket chain managements to formal letters asking for co-operation with the CONSUMERCHOICE project were variably positive in Estonia, the Netherlands, Slovenia, Spain, Sweden and the UK, with some response also in Germany. Polish and Czech managements ignored the requests or promised an interview and then failed to deliver it. However, retailers in Greece, the Netherlands, Spain, Sweden and the UK post statements on GM policy on their websites;
- in general, the location of GM- and non-GM-products on the shelves appears not to be significant either for consumer decision-making or for retail sales;
- non-GMO-labelled products were usually placed together with other similar foods,

sometimes on special shelves with products labelled “BIO”, “Organic” or “Healthy” (Table 1, column 5);

- the range of products offered showed greater variety depending on the size of the grocery shop rather than the region of the country. In some countries the district is important; thus, in the UK, GM-soya cooking oil appears to be favoured by the Asian community so that outlets catering for them tend to be the ones stocking those products;
- there were substantial differences between individual countries both in the variety of GM-foods on sale and number of GM-food products on sale. While 21 and 27 brands of GM-foods were on sale in Czech Republic in the earlier period and later periods, respectively, there were 18 GM-products in the Netherlands, 13 in Estonia, 6 in Spain and 2 or 4 in the UK. No GM-foods was on sale in grocery stores in Greece, Sweden or Slovenia (Table 1, column 7);
- the most common GM-labelled product was soya cooking oil labelled as “containing GMO”, “made from genetically modified soya (or GM raw material)”, or something similar. GM-labelled foods included various other products containing soya oil, soya proteins as well as maize oil and other products. (Note that such oils will actually contain no detectable GM-material but as they are “derived from GM sources” they must be labelled. It is a moot point as to what proportion of consumers will know that “containing GMO” material need not actually mean that.);

Table 1. Store visits, products and retailers

1	2	3	4	5	6	7	8
country	frequency of visits	number of towns	number of store visits	special shelves for non-GM?	retailers: information sources	no. of GM-foods	no. of GM-free products
CZ	yes, 2x	3+3+3	83	BIO, healthy	requests for interviews ignored	21 / 27	41 /75
DE	yes, 2x	1+2+1	20	no special	interviews promised	1/1	various soy milk products)
EE	yes, 4x	2+2+1	28	no special	interviews	9/13	6/17
ES	yes, 2x	1 (4 districts)	14	no special	interviews	6	21
GR					statements against GMOs on websites	0	0
NL	yes, 2x	2+0+1	5 chains	restricted GM	interviews; website	18	1 restr.
PL	yes, 2x	3+0+12	176	special in major	requests for interviews ignored	1 (in various sizes)	various
SE	yes, 4x	1+2+1	52	conventional equivalents/low lactose	14 answers	1 beer	63
SL	yes, 2x	3+3+3	26	no special	55 answers websites +	0	10/13
UK	yes, 2x	2+1+1	7 chains +	for "organic" products	interviews + partial sets of answers to questions	3	5

- the use of “non-GMO” or its equivalent as a food label is restricted in the Netherlands and Germany, and is not used in Greece. In other countries manufacturers and retailers use such “negative labelling” with various wordings. By the close of the inquiry we had found 75 brands labelled as “product does not contain GM-raw material” or similar in the Czech Republic, 60 brands in Sweden, 23 in Slovenia, 21 in Spain, 17 in Estonia and about 20 in Poland. Most were derived from soybeans and included soya drinks, soya milk, meat, etc. Other brands were vegetarian foods, dried fruits, products from corn, sunflower and rapeseed oils. A few such items (5) were found in UK; 1 non-GM product (eggs) was found in The Netherlands despite the restriction (Table 1, column 8).

Conclusions

Consumers in the ten EU Member States contributing to this study have limited choice for buying GM-labelled foods. Retailers offer some GM-labelled products in six of them but none at all in Greece, Slovenia or Sweden (save for the beer). Quite a wide range of GM brands were found in the Czech Republic, Estonia and the Netherlands. In the UK, GM-soya oil is available primarily in stores serving the Asian community. In total, in-store investigations revealed 68 products labelled as genetically modified for which the basic raw material for GM-foods was soybeans as approved under EU regulations. Some products labelled as “non-GM” were found on the shelves in most of the countries.

Chapter 4

ANALYSIS OF THE EUROPEAN MEDIA

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Gunvor Pohl-Apel
Gabriele Sachse

Introduction

Media landscapes in the ten partner countries are quite different. In some countries (e.g. Germany), a multitude of print products dominates the media, whereas in others (e.g. Slovenia) only a few print products exist – simply because of country size and number of inhabitants. The project partners selected relevant daily newspapers (local, regional, national, tabloid) and magazines, if available. Internet newspapers and journals as well as internet coverage of broadcasters were also considered. A detailed analysis of the media data of each country is presented in the respective country reports.

Methodological aspects

Print or online editions of the daily newspapers and magazines were monitored for articles related to GM-food and GMO issues respectively. Whenever accessible, electronic press clipping services were employed. Similar key words were used in all countries, including (translated into local languages): genetically modified, genetic modification, GM, GMO, GM-food, GE-food, Frankenfood, (GM)-labelled. Details of media selection and data collection in each of the partner countries are presented in the detailed country reports.

The articles were differentiated into three categories:

- news reports, including local, regional, national and international news;
- debate/comment articles, including opinions, editorials and letters to editors;
- other articles published on consumer pages, science and technology pages, etc.

Evaluations have been done on the basis of the three categories: news, comment and letters

Article contents were classified as positive (pro-GM), negative (anti-GM) or neutral/balanced. The criteria were:

- the item offered a message that was clearly pro-GM or anti-GM although sometimes containing a *brief* or *subsidiary* mention of the opposing view;
- the item was “neutral” in the sense of straight news reporting with no overall pro- or anti-GM conclusion or “balanced”, meaning that opposing viewpoints were presented with roughly equal weight.

Results

Media traditions vary greatly among the ten Member States participating in the project. Large countries (Czech Republic, Germany, Greece, the Netherlands, Poland, Spain, Sweden and the UK) tended to have more titles than small ones (Estonia, Slovenia). Moreover, regionalism is important: Germany has more regions (*Länder*) than the other countries and

this is reflected in the number of regional titles although Spain and the UK also have distinct regions, each with their own titles. In small countries (Estonia, Slovenia) separate regions with their own media are less significant.

Within the project timeframe, a total of 280 daily newspapers were monitored. As shown in Fig. 1, the majority were regional and local dailies although national publications were, of course, very important in terms of readership and influence. The investigation included 13 tabloids.

In addition, 37 magazines (political, science, women's', etc.) were screened. Some partners recorded data from broadcasting; thus, 14 TV stations and 13 radio stations were monitored (see Fig. 1). Altogether, the survey of the media landscape in the ten countries delivered an adequate basis for the evaluation. comprehensive survey of the media landscape of the ten countries.

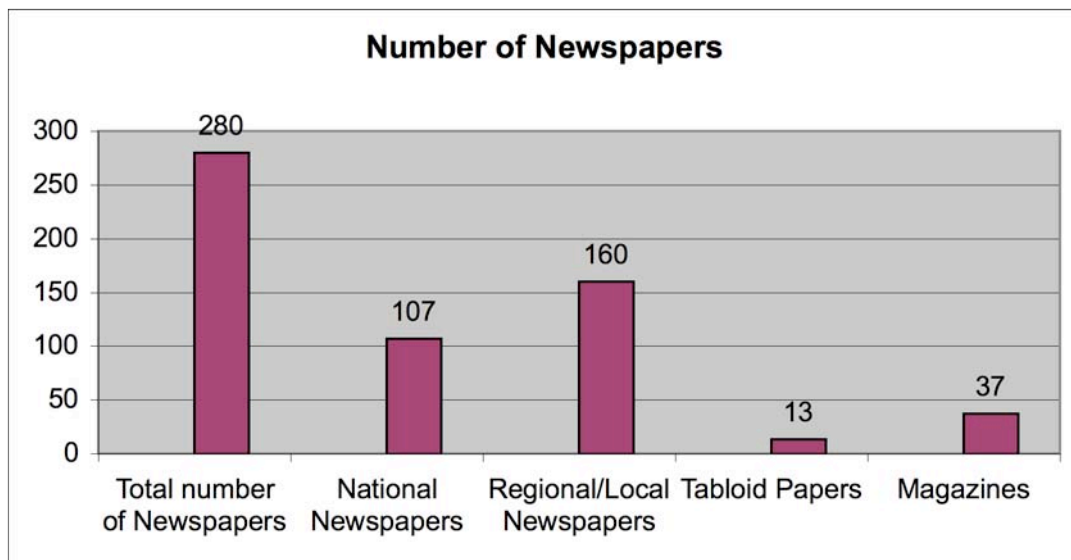


Fig. 1. Print media analysed

In the 20 months from July 1, 2006 to February 29, 2008, articles were logged, categorised and summarised monthly. An overview of the number of articles collected in the partner countries and the average number per month is shown in Table 1. Due to the unequal number of media outlets selected, the overall number of articles varied widely. However, except in Germany and the UK, the average number of articles was low, varying between 2 and 11. In Germany and the UK the monthly averages were 54 and 35 items, respectively. The high German figures are very likely attributable to the amendment of the German Genetic Engineering Law that attracted considerable media interest while the UK media have shown a high level of interest in GM issues for the past decade and respond vigorously to each new development.

We conclude that apart from these two large countries, the general media interest in GM-food and related issues is rather low.

Table 1. Overall and monthly average numbers of GM-related articles monitored in partner countries

country	total no. of articles in 20 months	average no. of articles per month
Czech Rep	185	9
Estonia	45	2
Germany	1078	54
Greece	128	6
Netherlands*	148	7
Poland	216	11
Slovenia	77	4
Spain	98	5
Sweden	185	9
UK	692	35
average		14.2

* Netherlands: only media items in general newspapers were considered. Items published in the Agricultural Newsletter (*Agraisch Dagblatt*) were disregarded because of its emphasis on agriculture and the greater likelihood of GM reporting.

The monthly distribution of media items in some of the partner countries revealed a clear event-driven coverage of GM food. The following newsworthy events stimulated media interest in more than one country:

- September 2006: unapproved GM-rice (LL 601) from the US was detected in supermarkets. This issue was taken up in Germany, The Netherlands, Sweden and the UK.
- March 2007: EU approval of GM corn was debated after a research report claimed that the GM-corn could pose health risks to humans. Subsequently, the credibility of the research report became into focus of the debate. Media interest was raised in mainly Germany and Sweden.

More than two-thirds of the published items were news-related, followed by comment/debate and then letters (see Fig. 2).

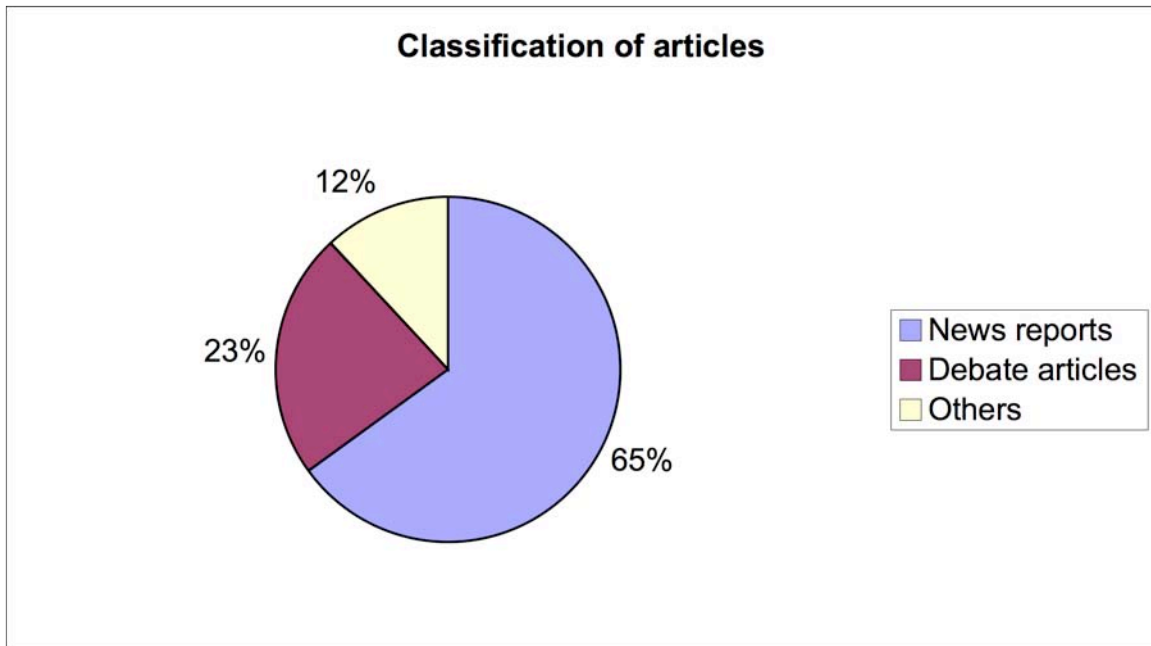


Figure 2. Article categories

The original intention had been to classify items according to their headlines but that was soon abandoned. Headlines were often more provocative and more negative than the article itself. Analysing solely the headlines would have rated a much higher number of articles as negative. Content, not headlines, thus became the sole criterion for classification.

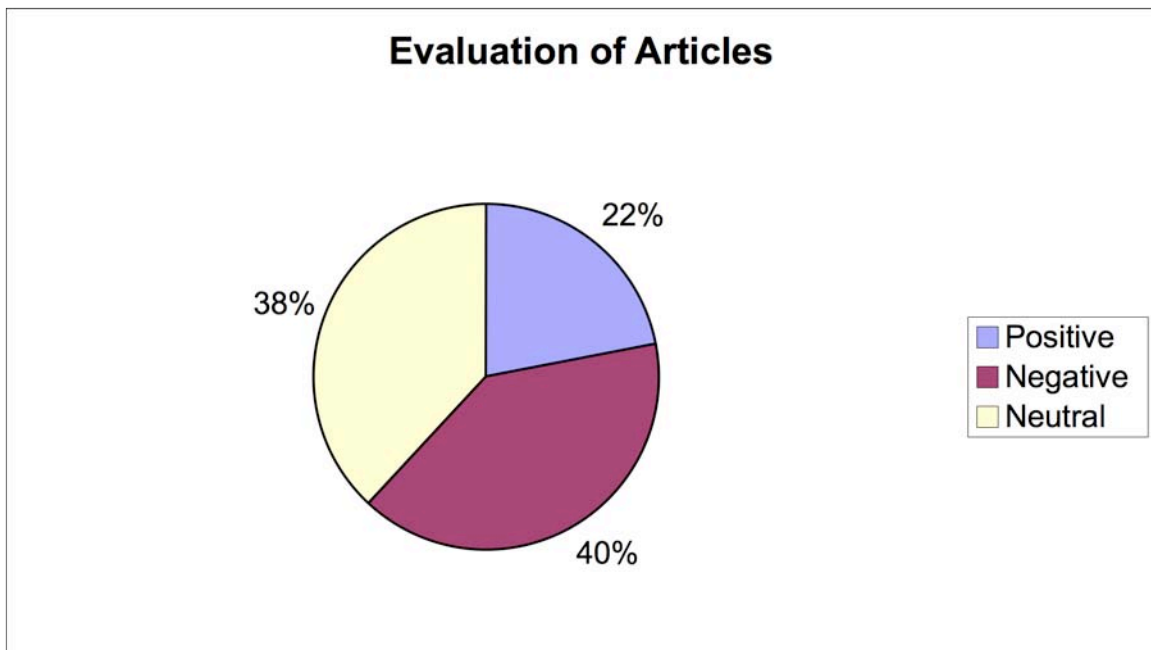


Figure 3. Classification of article content

Table 2. Evaluation of articles

country	positive articles (% of total)	negative articles (% of total)	neutral articles (% of total)
Czech Rep	27	33	40
Estonia	16	42	42
Germany	18	48	34
Greece	6	86	8
Netherlands	7	5	88
Poland	67	13	20
Slovenia	8	59	33
Spain	15	40	45
Sweden	17	49	34
UK	38	25	37
totals (%)	22	40	38

Fig. 3 shows a fairly similar percentage of articles with neutral or negative content, whereas only 22% revealed a positive attitude towards GM-food. With a majority of publications classified as news reports (see Fig. 2), one might expect a greater proportion of neutral articles. Three countries were exceptions from this pattern (Table 2): in Greece the majority of articles had a negative content whereas in Poland, the majority had a positive tenor. In the Netherlands most articles were neutral, with the majority of media items (>90 %) being news reports.

It should be noted that by their very choice of items to publish – and certainly by the headlines they carry – straight “news” reporting can also carry a positive or negative connotation. A report of a statement from a source claiming a new “benefit” from some aspect of GM-technology would be scored as positive: the newspaper or broadcasting station had chosen to publish the item when they need not have done so and others, perhaps, had indeed not published it. Conversely, the report of an opposition source claiming a new “risk” from the technology would, on the same grounds, be scored as negative.

Conclusions

As the average frequency of articles was judged to be low, and the majority of them categorised as news reports, it is reasonable to conclude that media interest in GM food and related issues is limited in the partner countries. However, specific national or local events do raise interest, mirrored by an increased number of articles and reports for short periods.

Overall, it is clear that public debate on GM foods in the partner countries is subdued. With a majority of articles classified as neutral or negative, the evaluation revealed more or less of a negative attitude towards GM-food and agribiotechnology by editors and/or journalists.

This media survey was formally completed in May 2008; since then there has indeed been an upsurge in interest. We note elsewhere the remarkable change in the balance of favourable/unfavourable reports on GM which has occurred in the UK in the past year (see Chapter 16, page 16-10) and, to a lesser extent, in Estonia, the Netherlands, Poland and elsewhere. Some of this renewed interest is no doubt driven by the recent global rise in food prices, actual reported food shortages in some of the poorer countries as well as claims and comments that GM technology might contribute to lower food prices and to a resolution of what some are calling a “world food crisis”.

Chapter 5

FOCUS GROUPS

Victoria Wibeck
Therese Asplund

Introduction

Earlier studies of the public understanding of genetically modified crops and foods have shown that many Europeans are sceptical; the Eurobarometer survey undertaken in 2005 (1) is just one example. From that survey, it was obvious that unless GM food products are seen to have consumer benefits, the public will remain sceptical. Nevertheless, the picture of European opinion is somewhat variable. Even though a high proportion (often a majority) of European citizens have said in one form or another that they oppose GM foodstuffs, in some EU countries – the Czech Republic, Ireland, Italy, Lithuania, Malta, Portugal and Spain – supporters outnumber opponents (1). At the same time, most people state clearly that consumers should have freedom of choice about whether or not to buy GM-foods (2).

To secure a deeper understanding of the arguments and value premises underlying the opinions expressed, a number of qualitative studies have been undertaken during the last decade. They have shown, for instance, that attitudes to GM-food are linked to moral, existential and epistemological issues about trust and people's sense of agency. Lay scepticism towards GM-food may be influenced by a lack of trust in the institutions and actors responsible for the new technology (3-5), or by a lack of a sense of agency (1, 4, 6). In addition, GM-food is sometimes perceived as "unnatural", challenging traditional perceptions of nature and of humanity's place in nature which may bring about moral objections (4, 6, 7).

Many of the those studies were conducted in the late 1990s and the early 2000s when there was a widespread societal debate about the legitimacy of GM-foods. In the light of recent approvals of GM-products and field trials in the European market, and the relative political and mass media silence on GM-issues, we find it relevant to explore again the understandings and representations of GM-foods among the lay European public. Are there other types of arguments occurring in lay peoples' discourse today? Do GM-foods still evoke emotions and ethical and epistemological concerns? How do people conceive of labelling issues? Is there an expressed willingness to buy GM-products once they exist on the market? What are the arguments for or against buying GM-labelled products?

To investigate these questions, we have conducted focus groups in seven European countries: Greece, the Netherlands, Poland, Slovenia, Spain, Sweden and United Kingdom. The focus group studies aimed to explore: (a) lay people's expressed views on labelled GM-foods and their willingness to buy them, and (b) the implicit value premises/assumptions underlying the arguments presented in the focus group discussions.

Methodological considerations

A focus group is a focused group interview in which a small number of participants are brought together to discuss a given issue under the guidance of a moderator who preferably assumes a retracted position (for an introduction to focus group research, see 8-10). The comparatively free form of discussions found in focus groups enables the researcher to uncover aspects of the topic in hand that could not have been anticipated but that are brought to the fore spontaneously in the discussions and thereby proven to be of importance to the participants.

Focus groups are chosen since they offer a research method well suited to generating a rich understanding of participants' beliefs and experiences (11). Focus group methodology enables analyses of what the participants bring to the group. But they also constitute "thinking societies in miniature" (12), where the process of joint meaning-making in action may be studied (13). Thus, focus group methodology is well suited to study socially shared knowledge as it is constructed, expressed and negotiated in a group (14).

Nevertheless, like all research methods, focus groups have their limitations. Their purpose is not to draw statistical conclusions that are generalisable to a population at large (11, 15). On the contrary, focus groups provide depth and insight into a particular topic which can very well be combined, for example, with survey research (11).

Selection and recruitment of participants

The seven countries included in the study were selected to cover both nations where there exist GM-products in stores and countries with no products currently available. Within The Netherlands, Slovenia, Spain, Sweden and United Kingdom, four groups were selected in each country. In Poland, the special case of the Government attempting to establish that country as a "GMO-free zone" (rejected by the European Commission in early 2008) motivated enlarged data collection. Hence, six focus group discussions were conducted before and four after the rejection by the Commission. In Greece, which has a history of massive political and public resistance to agribiotechnology, a total of six groups were conducted.

The focus group data were collected between September 2007 and March 2008. Each focus group consisted of 4-8 participants and of both men and women, but was internally homogeneous with regard to age and level of education. Thus, with some minor variations as noted in Chapters 10 (page 10-15) and 12 (page 12-6), the following matrix (Table 1) was used to recruit participants:

Table 1. Segmentation of focus groups.

age:	highest level of education:	
20-30	High school	University
30-60	High school	University

Since the focus group questions revolved around consumption habits and intentions, we selected participants who were involved in food purchases, either directly (those who buy foods in stores) or indirectly (e.g. husbands or wives who do not usually make the purchases but who influence the family's consumption patterns by having a say in what to buy). This left out young people living with their parents. People who were older than 60 years of age were also excluded since they might not be regarded as the most important target group by the

retail food chains. The participants were divided into different groups based on their level of education in order to avoid hierarchies and differences in social status which might hamper the discussions. An overview of the data corpus is presented in the following table (Table 2):

Table 2. Overview of the data corpus.

country	GM labelled products available in stores?	number of groups	number of participants/group
The Netherlands	Yes	4	4-5
Poland	Yes	10	6-8
Spain	Yes	4	6-8
United Kingdom	Yes	4	7
Greece	No	6	6-7
Slovenia	No	4	5-8
Sweden	No	4	3-4

Interview procedure

The focus group interviews followed a similar structure in all seven countries (see Appendix 1). As a consequence, all focus group interviews were semi-structured with a relatively large degree of freedom for the participants to develop topics which they themselves experienced as central. The participants were encouraged primarily to discuss among themselves rather than directing their utterances towards the moderator. This succeeded to a varying extent in the different groups.

Even though the general frame of the focus groups was the same in all the countries, there were some variations in the actual procedure of the interviews. Because national contexts differ, different priorities needed to be made. For instance, one important difference lay in the presence or absence of GM-products in stores. In countries where there were no products available, the focus group discussions took a hypothetical character: the participants discussed what they would do were they to have the choice of selecting GM-labelled products. By contrast, the Dutch and the Polish focus group participants were given the task of simulating actual purchasing behaviours to test whether or not the GM-label influenced their choices.

The focus group sessions aimed to resemble as far as possible a “natural” conversation. Thus, the moderators took on relatively retracted roles, interfering as little as possible. In all countries, the participants were given the opportunity to raise topics that were central to them but that were not included in the interview guide.

Documentation and analysis

The focus group discussions were tape recorded and transcribed in their entirety. The data were subsequently analysed by means of *thematic content analysis* (16). In practice, the analysis encompasses procedures of (a) dividing transcripts into segments, based on the identification of topic shifts; (b) coding the segments by assigning “labels” to them, i.e. nouns or nominal phrases summarising the content of the segment; (c) identifying recurrent sub-topics in the coded list of segments; and (d) identifying recurrent themes which captured several sub-topics and which constituted a more abstract summary of the content of the focus group discussions.

In other words, a horizontal approach was used throughout the analytical process (17). In each country, all data were analysed as one text and the identification of recurrent sub-topics and themes was based on the entire material. In Spain and Slovenia, additional vertical analyses were undertaken, exploring similarities and differences between the four focus groups.

In Sweden and Greece, further analyses focused on the use of analogies in the focus group discussions (cf. 14, 18) since they were frequently used by the participants as a value-laden communicative tool to argue for a certain standpoint or to make sense of the issue of GM-foods.

Ethical considerations

Throughout the project, careful attention was paid to ensure the participants' informed consent. This means that each participant was informed about the aim of the study, about the methodology to be used and about their rights before consenting to participate. Each participant had the right to withdraw from the study at any moment, even though no-one chose to do so. Confidentiality was ensured by excluding the participants' names and places of residence from all transcripts and reports.

Results

In this section, we will discuss the most prominent themes and arguments recurring in the entire focus group data (i.e. in all seven countries). Furthermore, we will discuss differences between arguments put forth in the different national contexts. More detailed analysis of national specifics in the focus group data is provided in the respective country chapters.

When inviting participants to the focus groups, potential interviewees were asked to participate in a discussion about how they select their foodstuffs. Not mentioning GM-labelling at this stage was a way of investigating what was at the forefront of participants' minds when thinking about buying food.

Was GM-labelling even considered in their purchasing decisions?

The focus group discussions revealed that the overall awareness of GM-products and labels was very low. The participants did not mention labels related to gene technology as a factor influencing their purchasing decisions either in those countries where GM-products are available in stores or in those where products labelled "GM-free" are on sale. Instead, other factors were put forth such as quality and freshness, value for money, familiarity with the products, and lifestyle values related to health and the environment.

One recurrent argument discussed in all countries concerned the importance of the quality of the products as regards taste, freshness and appearance of products and packages. Price was something that most participants agreed was important but it was rarely mentioned as the main factor determining purchases. Nevertheless, the participants of several focus groups emphasised the importance of value for money: a more expensive product may be selected if judged to provide other values such as better taste, a well-known brand, etc. In addition, familiarity with the product and/or the brand seemed to be important. Many interviewees stated that they usually buy what they have always bought, and what their parents used to buy. This type of behaviour also influences the very activity of walking around in the store. The participants tended always to take the same route through the store and always to look at the

same shelves. Moreover, lifestyles influence people's way of acting in the food store. Focus group participants in The Netherlands, Spain, Sweden and the United Kingdom expressed their wish to buy products which may facilitate a healthy living. Organic food products were also pinpointed as contributing to a preferred lifestyle by participants in The Netherlands, Slovenia, Spain, Sweden and the UK even though some participants regarded them as too expensive. Locally produced food was also said to be preferred by focus group participants, for example in Slovenia and the United Kingdom.

Information, labelling and trust

In all seven countries it was evident that the participants experienced a lack of information about GM-issues. Prior to the focus group session, gene technology was not an issue to which the participants seemed to have paid much attention. The overall awareness about the availability of GM-products on the market and about labelling requirements was low.

A common argument running through the discussions in The Netherlands, Poland, Sweden and the United Kingdom was that people should be given individual autonomous choice on whether or not to buy GM-products. This argument implies that GM-products should be labelled to facilitate consumer choice. Nevertheless, participants repeatedly stated that they seldom read labels. Looking at labels was done mainly by participants having a special interest in doing so, e.g. to avoid allergic reactions or the like. In the Dutch focus group sessions, where real-life purchasing activities were simulated, it was obvious that the participants did not read the product labels or the declaration of contents for information. Instead, they looked for well-known brands, low price and attractive packaging.

When the focus group participants discussed their perceived lack of knowledge and information about GM-issues, an underlying argument was that the source of information is crucial in judging the credibility of the information. It was, however, also clear that different types of information sources were considered as trustworthy in different countries. In the Dutch and Spanish focus groups, for instance, hearsay from friends and family was referred to as a valuable source of information. Independent sources, such as national authorities, were pinpointed as trustworthy information providers by participants in Greece, Spain, Sweden and the United Kingdom. There were diverging opinions across the focus groups as to whether or not scientists should be considered trustworthy, or as having a vested interest in the development of gene technology. The Swedish focus group participants pointed to scientists as trustworthy but hard to understand: clearly there is a need for able science communicators. On the contrary, the Greek participants expressed limited trust in scientists since the scientific community was perceived as promoting one-sided subjective information on GM-issues. In Poland, the focus group participants expressed a very high trust in scientists: they argued that decisions on certain complex topics in society, such as gene technology, should be left to experts. Thus, scientifically based arguments were perceived as the most valid.

Risks and possibilities

An analysis of the focus group data collected in the seven countries demonstrated that risk arguments outweighed arguments pinpointing possible benefits. This pattern was, for instance, displayed in the Swedish data, where every time someone suggested a possible benefit, counter-arguments were voiced, emphasising dimensions of risk.

Risks perceived by the focus group participants could be divided into the following four types of arguments: ethical concerns, emotional resistance, health concerns and environmental risks. The ethical concerns related, for instance, to the perceived unnaturalness of gene technology, which was discussed in the British, Dutch, Slovenian and Swedish focus groups. Those who perceived gene technology as unnatural made a clear distinction between gene technology and traditional breeding: gene technology was described as an activity in which humans “meddle” with natural processes. In addition, participants in the Greek and Swedish groups expressed their moral concerns about the risk that large companies may exploit local people in poor countries, with people becoming dependent upon multinational enterprises. In the British and Dutch focus groups, participants explicitly voiced emotional resistance to GM-products, claiming that they had an “uneasy feeling” about them. Such emotional resistance may also underlie the argument that gene technology is “unnatural”.

Arguments related to health risks encompassed, for example, fear of increasing food allergies and of serious diseases such as cancer. This fear was based on the argument that the effects of gene technology are difficult to foresee and that there is still not enough experience and evidence to claim that GM-foods are safe for health. Finally, the risk of unforeseeable negative consequences for the environment was discussed in all countries. Thus, participants were concerned about pest resistance and dispersal of GMOs in “natural habitats” and to conventional crops.

Advantages of biotechnology were discussed only in the British, Dutch, Greek, Spanish and Swedish data, where the main advantage was related to the possibility of producing more crops to reduce famine and secure the livelihood of a growing world population. This argument was sometimes based in a discussion about ways of adapting to global climate change; hence the possibility was suggested of producing drought-resistant crops.

Nevertheless, in the discussions about famine reduction it was obvious that participants, while seeing advantages on a global level, were sceptical about advantages locally. This could be interpreted as a kind of NIMBY (“not in my backyard”) reaction, where risks could be accepted if they were located somewhere distant but not close to home. On the global scale, participants could sometimes see the benefits of gene technology overriding health and environmental risks.

Willingness-to-buy

Even though risk arguments remained prevalent in the focus group discussions, there were some arguments put forth to why GM-foods could still be considered an option. In Sweden and the United Kingdom, some participants stated that if GM-foods could become a tool for reducing starvation, they would be morally acceptable. Consumers in the rich parts of the world might thus possibly consider buying GM-products as an act of solidarity. Price was also mentioned as an important factor in the Slovenian, Spanish and Swedish data, even though low price alone seemed not to be a sufficient condition. Furthermore, participants in Slovenia, Spain and the United Kingdom pinpointed health benefits as preconditions for purchasing GM-food products. Benefits of GM-products to the environment were discussed in the British and Swedish focus groups but received mixed responses. A counter-argument was raised that it is more environmentally friendly to produce organic crops than to use gene technology.

Discussion

In the European debate, gene technology in relation to food production has long been framed as an issue of risk (19-23). The academic discussion about social aspects of GM-foods has departed from the sociological discussion about “risk society” (24), where “risk is a statement about how we want to live, our relations to nature and the standards we are prepared to tolerate as rights-bearing citizens” (3, page 287).

In comparing our focus group results to earlier studies of the public understanding of genetically modified food (e.g. 3-7), we find many similarities. In the present study, it was evident that risk arguments were still prevalent in the discussions about GM-foods. For the most part, risks outweighed possible benefits in the focus group participants’ argumentation. In scrutinizing the arguments put forth in the focus groups, we interpret them as resting upon some implicit assumptions which seem to have remained relatively stable even though media attention and public debate on GM-foods was much louder a few years ago. First, the argument that gene technology in food production brings about moral concerns rests upon the premise that nature is inherently good. Consequently, if gene technology was regarded as “unnatural” it was also conceived of as non-acceptable. Second, the “feeling of unease” expressed by some focus group participants could be interpreted as one example of how emotional considerations take precedence of rational calculation of risks and benefits. Regardless of whether GM-foods are proven safe for health or for the environment, people remain sceptical because of emotional unease. Third, some parts of the argumentation rested upon the assumption that it is important to have control. Considerations about health and environmental impacts were based on fear of unknown negative consequences. In this respect, gene technology was regarded as having an inherent power that would be dangerous if released, potentially bringing about irreversible damage to the environment and human health. Furthermore, control was also emphasised on an individual level, in that there was a strong emphasis on the importance of labelling GM-food.

The differences from earlier studies lie mainly in the current low awareness of and interest in GM issues. GM-foods seem to have been more clearly on the agenda of the public debate a few years ago (cf. 25). In contemporary Europe, it seems as though GM issues are currently low among the personal concerns of Europeans and not prominent as part of public debate in Europe (see Chapter 4: “Analysis of the European media”). This is also mirrored in the focus group discussions in which participants repeatedly said that they lacked information about GM issues. It was also evident that gene technology was not considered when the participants discussed factors influencing their purchasing behaviours.

Yet a difference in the public debate is the present emphasis on climate change, which was also clear in our focus groups. One recurrent argument in favour of the development of “green” agribiotechnology was precisely that as a means of adapting to climate impacts, gene technology could contribute to secure the livelihood of a growing world population experiencing increasing vulnerability to extreme weather events, droughts and floods. This observation is consonant with the marked change of public mood in the media and public statements in some of the participating countries in the period during and after the focus group studies (see Chapters 4 and 16).

It is of interest to compare some of our focus group findings with the Eurobarometer results of 2005. In the Eurobarometer survey it was evident that a majority of European consumers did not think that GM-food should be encouraged. It was regarded as non-useful, morally

unacceptable and risky to society (1). These results are mirrored in our focus groups. Nevertheless, among the reasons for buying GM-foods, the most convincing arguments according to the Eurobarometer were related to health benefits and reduction of pesticide residues. As in our focus groups, opinion was split on the environmental benefits of GM-crops. However, the Eurobarometer survey did not include questions related to the acceptability of GM-foods in the light of climate change and overpopulation, issues much discussed in our own focus groups. It is therefore hard to judge whether or not these arguments might already have been important to the respondents in the Eurobarometer survey of 2005, or whether they have been entirely triggered by the current strong media and political attention to climate impacts and measures for control or adaptation.

Conclusions

In sum, our focus groups showed that GM-food is not a topic at the forefront of consumers' minds when discussing food purchasing habits. Labelling was demanded by the participants yet few of them actually looked at the labels when buying food. Sceptical arguments were more dominant than arguments about potential benefits but it seems that, in the future, climate and population restraints to food availability may lead to more accepting attitudes to GM-food.

Would our focus groups buy GM-foods if they were on the shelves in their favourite grocery stores? Maybe or maybe not. Do they actually do so is addressed mainly in Chapters 4 and 6.

References

1. Gaskell, G., Allansdottir, A, Allum, N., Corcero, C., Fischler, C., Hampel, J., Jackson, J., Kronberger, N., Mejlgaard, N., Revuelta, G., Schreiner, C., Stares, S., Torgersen, H. & Wagner, W. (2006), *Europeans and biotechnology in 2005: patterns and trends*. Eurobarometer 64.3. Report to the Europeans Commission's Directorate-General for Research.
2. KRC Research (2003). *European views on agricultural biotechnology. An overview of public opinion*. (http://abeurope.dynamicweb.dk/images/files/Public_opinion_overview_on_biotechnology.pdf)
3. Grove-White, R., Macnaghten, P., Mayer, S. & Wynne, B. (1997). *Uncertain world. Genetically modified organisms, food and public attitudes in Britain*. The Centre for the Study of Environmental Change. Lancaster University: Lancaster.
4. Wagner, W *et al.* (2001). *Nature in disorder: the troubled public of biotechnology*". In: Gaskell, G & Bauer, M (eds.) (2001). *Biotechnology 1996-2000: the years of controversy*. London: Science Museum.
5. Marris, C., Wynne, B, Simmons, P & Weldon, S. (2002). *Public perceptions of agricultural biotechnologies in Europe. Final report of the PABE research project*. (<http://www.pabe.net>)
6. Wibeck, V. (2002), *Genmat i fokus. Analyser av fokusgruppssamtal om genförändrade livsmedel* (Genetically Modified Food in Focus. Analyses of focus group discussions). Diss. Linköping: Linköping Studies in Arts and Science, 260.
7. Hugo, K. (2005), *Genmodifierade livsmedel och kommunikativ etik : En analys av etisk oenighet i debatten om genmodifierade livsmedel* (Genetically Modified Food and

- Communicative Ethics: An analysis of ethical conflicts in the novel food debate). Diss. Uppsala: Uppsala University, Department of Theology.
8. Barbour, R. & Kitzinger, J. (eds.) (1999). *Developing focus group research: politics, theory and practice*. London: Sage.
 9. Morgan, D. & Krueger, R. (1998). *The focus group kit 1-6*. Thousand Oaks: Sage.
 10. Myers, G. (2004). *Matters of opinion. talking about public issues*. NY: Cambridge University Press.
 11. Morgan, D. (1998), *The focus group guidebook*. The Focus Group Kut, no. 1. Thousand Oaks: Sage.
 12. Jovchelovitch, S (2001). *Contextualising focus groups: understanding groups and cultures*. Paper prepared for the V Meeting of the Group 'Conversation et language', Laboratoire Européen de Psychologie Social, Paris.
 13. Wibeck, V, Öberg, G & Abrandt-Dahlgren, M (2007). *Learning in focus groups: an analytical dimension for enhancing focus group research*. *Qualitative research*, 7,249-262.
 14. Marková, I., Grossen, M., Linell, P. & Salazar Orvig, A. (2007). *Dialogue in Focus Groups: Exploring Socially Shared Knowledge*. London: Equinox.
 15. Bauer, M & Gaskell, G (1999). *Towards a paradigm for research on social representations*. *Journal for the Theory of Social Behaviour*, 29:163-186.
 16. Wibeck, V. (2004). *Exploring focus groups: Analyzing focus group data about genetically modified food*, in: Aijmer, K. (ed.) *Dialogue analysis VIII: Understanding and misunderstanding in dialogue. Selected papers from the 8th IADA conference, Göteborg 2001*, pp. 287-298. Max Niemeyer Verlag, Tübingen.
 17. Rausch, M. (1998). *Analyzing and reporting focus group results*, in: Krueger, R, *Analyzing and Reporting Focus Group Results*. The Focus Group Kit, no. 6. Thousand Oaks: Sage.
 18. Billig, M. (1996). *Arguing and thinking. a rhetorical approach to social psychology*. 2nd ed. Cambridge: Cambridge University Press.
 19. Allum, N. (2007). *An empirical test of competing theories of Hazard-Related Trust: The case of GM food*. *Risk Analysis*, 27:935-946.
 20. Devos, Y., Maesele, P., Reheul, D., Van SpreybroeckL., & De Waele, D. (2008). *Ethics in the societal debate on genetically modified organisms: A (re)quest for Sense and sensibility*. *Journal of Agriculture and Environmental Ethics*, 21, 26-61.
 21. Curtis K.R. & Moeltner K. (2007). The effect of consumer risk perceptions on the propensity to purchase genetically modified foods in Romania. *Agribusiness*. 23, 263-278.
 22. Frewer, L., Lassen, J., Kettlitz, B., Scholderer, J., Beekman, V. & Berdal, K.G. (2004). Societal aspects of genetically modified foods. *Food & Chemical Toxicology*, 42, 1181-1194.
 23. Herrick, C. (2005). *Cultures of GM': Discourses of risk and labelling of GMOs in the UK and in EU*. *Area*, 37, 286-294..
 24. Beck, U. (1992). *Risk Society. Towards a New Modernity*. London: Sage.
 25. Torgersen, H., Hampel, J., von Bergmann-Winberg, M., Bridgman, E., Durant, J.,

Einsiedel, E., Fjaestad, B., Gaskell, G., Grabner, P., Hieber, P., Jelsoe, E., Lassen, J., Marouda-Charjoulis, A., Hviid Nielsen, T., Rusanen, T., Sakellaris, G., Seifert, F., Smink, C., Twardowski, T. & Wambui Kamara, M. (2002). *Promise, problems and proxies: twenty-five years of debate and regulation in Europe*, in: Bauer, M. & Gaskell, G. (eds.), *Biotechnology – the Making of a Global Controversy*. Cambridge: Cambridge University Press.

APPENDIX 1: SUGGESTIONS FOR TOPIC GUIDE

- what is important to you when you decide which foodstuff to buy?
- what do you think about when you hear the words “genetically modified food” [or the most frequently used term in the local languages] ?
- have you bought any GM-labelled/non-GM-labelled products? if so, what products?
- are there any circumstances under which you would buy GM-foods? (e.g. if there are added values such as health benefits, environmental benefits, reduced price etc.)*
- what benefits do you find in GM-foods?
- what risks do you see?
- do you read food labels when buying food? why? why not?
- is labelling of GM-/non-GM-products good? why? why not?
- from where do you gain information of GM issues? what sources of information do you consider to be trustworthy?
- how would you describe a person who (a) buys or (b) does not buy GM-food?
- do you want to add anything else?

*These alternatives should not be mentioned until the participants have had a chance themselves to identify added values.

Chapter 6

SHOPPER BARCODE SURVEY, OPINION POLLS AND QUESTIONNAIRES; METHODS AND FINDINGS

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The consortium explored consumer choice and motivations with respect to buying GM-foods in three ways:

- conducting a survey amongst GfK's consumer panel in eight out of the ten countries participating in the CONSUMERCHOICE project;
- polling UK and Polish citizens visiting or resident in the United States and Canada;
- interviewing German consumers in a local food store.

Poll of UK residents visiting North America

An online poll of UK residents who have visited North America in the past five years was conducted by questioning university staff and students whether they knew about the presence of unlabelled GM-ingredients in many foods on sale there, particularly processed foods, together with asking for the purchase behaviour of the respondents. Details are presented in Chapter 16, pages 16-14 and 16-32.

Poll of Polish origin living in or visiting the United States

An online poll was conducted among Polish residents who have visited or are living in North America. They were asked whether they were aware of the presence of unlabelled GM-ingredients in many foods particularly in processed foods on sale there and for their purchasing behaviour towards GM-products. Details are presented in Chapter 12, pages 12-2 and 12-12.

Motivation of German buyers for purchasing non-GM labelled products

In cooperation with a regional retailer, 317 purchasers of non-GM-labelled dairy products were interviewed in Germany. The respondents were approached in person immediately after they had selected the specific products. Their reasons for choosing the non-GM-product(s) were explored by way of five questions: motivation for this purchase possible preference for non-GM-labelled products and information status/background knowledge of GM-ingredients. Details are presented in Chapter 9, page 7.

GfK consumer panel poll

The GfK Group (GfK = Growth for Knowledge; <http://www.gfk.com>) is one of the worlds' largest market research companies, delivering information on markets and sectors to clients in the industry retail media and service sectors in more than 100 countries.

Consumer panel

In many European countries GfK has a consumer panel that keeps track of all their purchases of “fast-moving consumer goods” (FMCG), those used on a daily basis such as groceries, body care and cleaning products. The registered members of these consumer panels are asked to collect and register all their purchases by scanning or registering the barcodes of the products they bought and occasionally to fill in a questionnaire. (Special codes were nominated for purchases made without a barcode, for instance items from market stalls). Together with the consumers’ personal profiles, all the purchases are collected in a database. The members of the panels are usually those in charge of the household and therefore responsible for the weekly shopping.

For CONSUMERCHOICE it was possible to use this GfK service in eight of the ten countries involved; GfK does not offer the consumer panel in Estonia and Slovenia (Table 1).

Collection of barcodes

In all but one country participating in the GfK survey it was possible to collect barcodes for GM- or GM-free-labelled products on sale. Barcodes for the relevant products were collected by the CONSUMERCHOICE consortium and then used by GfK for identifying purchasers (buyers) of the specific items.

The collected barcodes were checked with the GfK database to see how many panel members had bought those products at least once in a one year period: this is the designated “market penetration”.

In the CONSUMERCHOICE project, countries were designated as selling foods labelled as GM, or GM-free. The Czech Republic, the Netherlands, Poland, Spain and the UK all have at least some foods on sale labelled as containing GM-ingredients (see Chapters 7-16 for details). For the UK, however, none of the GM-labelled products was found in the GfK database so it was not possible to select buyers of these products. Germany and Sweden offer GM-free-labelled foods. Greece is the only country that sells neither GM- nor GM-free-labelled products. However, it was possible to put the standard questions to the Greek panel; based on their opinions and behavioural intentions, they were asked to complete the GM-free questionnaire (Tables 1 and 2).

Table 1. Overview of the differences per country with regard to labelling, barcode panel sizes, number of GM- food buyers and the market penetrations for the labelled products

country	type of labelling	no. of barcodes	total size of barcode panel	total number of buyers	market penetration (%)
Czech Republic	GM	8	2000	273	13.7
The Netherlands	GM	18	6000	653	10.9
Poland	GM	1	5000	133	2.7
Spain	GM	7	8000	161	2
United Kingdom	GM	27	20000	0	0
Germany	GM-free	29	20000	873	4.4
Sweden	GM-free	22	3000	62	2.1
Greece	-	0		0	0

Table 2. Overview of the differences per country with regard to the questionnaire used, sample of buyers and non-buyers, and responses

country	type of questionnaire used	number of buyers	number of buyers responding	% response	number of non-buyers	% response
Czech Republic	GM	273	219	80	483	77
The Netherlands	GM	434	329	76	662	66
Poland	GM	133	83	62	501	59
Spain	GM	161	150	93	413	69
United Kingdom	GM	0	0	-	548	79
Germany	GM-free	873	605	69	491	82
Sweden	GM-free	62	37	60	502	48
Greece	GM-free	0	0	-	500	30

Respondents were classified as follows:

- GM buyers: purchased at least one item identified by the CONSUMERCHOICE consortium as a GM-labelled product during a defined one year period;
- GM-free buyers: purchased at one item identified by the CONSUMERCHOICE consortium as a labelled GM-free product during a defined one year period;
- non-buyers: purchased no items labelled as “containing GM-ingredients” or labelled as “free from GM-ingredients” during the survey period.

The GM buyers and GM-free buyers were groups selected from the panel based on the products they bought. The non-buyers were a random group of circa 500 people selected from the total consumer panel in each country, excluding the GM-free-buyers.

Research questions

The primary focus of the project was to answer the question “Do Europeans buy GM-foods?” EU regulations (EC) 1829/2003 and 1830/2003 require all products containing more than 0.9% GM-content to be labelled accordingly. These labels were introduced to facilitate consumer choice. With the level of consumer support for GM-food across Europe hitherto believed to be low (1), are European consumers aware that these products are for sale and have to be labelled?

The market penetration of GM-labelled products in the various countries showed that the consumers contributing to the GfK consumer panel did buy GM-labelled products. In addition, we were interested in the levels of understanding of GMOs of all GfK shoppers, the motivations they might have for buying the products and their attitudes towards GM-products in general. Their answers were subsequently compared with their actual behaviour.

Therefore the following research questions can be phrased:

- do consumers recognise GM-foods?;

- do consumers react towards GM-labelled products as they say they would? With labelling in place consumers can make an informed choice about whether or not to buy products containing GM-ingredients and act accordingly;
- what are consumer attitudes towards GM-ingredients in food? Europeans have in the past been perceived to be negative towards GM-foods: do they remain negative or have they changed over the years?;
- is there a significant difference between the responses of consumers who do actually buy GM-labelled products and those who do not?

Method

Two Questionnaires

For questioning the household panel members, two different questionnaires were developed based on the type of labelling predominant in the various countries: one questionnaire was used in countries with GM-labelled products for sale, the other for those with non-GM-labelled products (see Table 1).

The questions used were based on those from other surveys, including the Eurobarometer (1) and the Dutch TNS/NIPO study (2) so that results could be compared. There are three types of questions:

- about knowledge and understanding of GM-labelling of consumer products;
- about attitudes towards GM- or GM-free-labelled products;
- about perceived behaviour towards those products.

See Appendix 1 (page 6-19) for further details and explanations of the questions used in this survey. Questions were translated into the various languages as appropriate; the English language versions are on pages 6-19 and 6-20. For most questions, answers were recorded as “yes”, “no” or “don’t know”. For question 8 in countries with GM-labelling, a five-point approval scale was used together with “don’t know”. And for the last question of both questionnaires a ten-point valuation scale was used; for the later analyses, this valuation scale was recalculated back to a five point scale together with “don’t know”. It is thus possible to find a majority of answers corresponding to a value of less than 50%.

Analyses

Data were analysed by means of the Statistical Package for Social Sciences (SPSS) software, version 16. Chi-square tests were used to compare answers given by buyers and related non-buyers.

Results

Countries using the GM-label (excluding the UK)

The following summary aggregates the findings from all the countries in which GM-labelled foods are sold. Details for the individual countries can be found on the following pages.

For all countries with GM-labelled products on sale, 75% of the respondents claimed to know that GM-products have to be labelled by law. Nearly 60% said they did not know how to distinguish a GM-containing product from a conventional one. Although not everyone read the detailed ingredients list before they bought a particular food item, 54.1% of the respondents said they did do so. There was no significant difference between buyers and non-buyers in the answers to these three questions.

There was a significant difference between buyers and non-buyers with respect to how much they cared whether or not they bought food containing GM-ingredients ($\chi^2=14.433$, $p<0.05$); although for both groups it mattered whether their food contains GM ingredients, it mattered more to non-buyers (50.2%) than to buyers (42.3%). Buyers and non-buyers also differed significantly in how careful they were not to buy GM-labelled products ($\chi^2=9.709$, $p<0.05$); most buyers were not really careful (55.6% average of total), with buyers of GM-labelled food caring even less (59.4%) than non-buyers (54.1%).

Comparison of the respondents' actual behaviour with their *perceived behaviour* revealed no significant difference between buyers and non-buyers. Half the respondents (49.8%) said they did not buy GM-labelled food. Interestingly, 48% of the GM-buyers thought they *did not* buy GM-labelled food. Conversely, almost 23% of non-buyers thought they *did* buy GM-labelled food. A remarkably high number of respondents (30%) claimed not to know.

No difference could be found between buyers and non-buyers as to whether they would buy organic food if it contained GM-ingredients; most respondents (54.2%) said they would not do so. We did, however, find a significant difference between buyers and non-buyers on the question of whether food containing GM-ingredients is safer for health. Most respondents neither agreed nor disagreed (37.5%), but more non-buyers tend to be less positive ($\chi^2=13.919$, $p<0.05$). The majority of respondents (56.8%) said they would not buy food with GM-ingredients even if it offered possible benefits (better taste, lower prices, healthier and environment friendly), with no differences between buyers and non-buyers.

Of all respondents, 75.3% regarded gene technology in food production as undesirable; 5.5% were undecided and 19.2% had no opinion. Again no difference between buyers and non-buyers could be detected.

There are differences in the responses of buyers and non-buyers between individual countries which are identified in the following paragraphs.

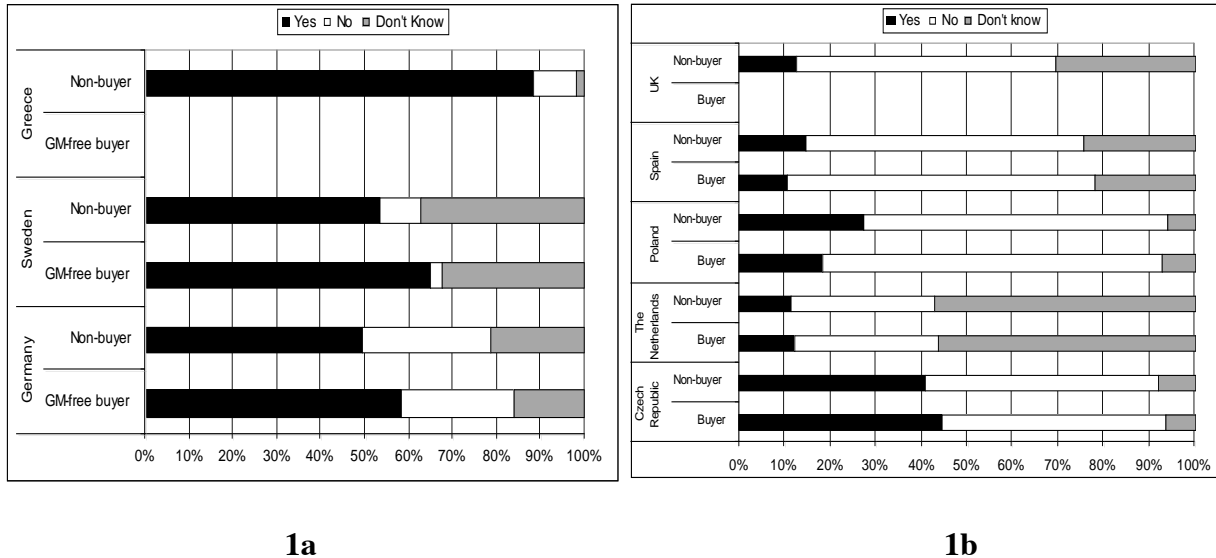


Fig. 1. 1a shows the percentages of respondents in each country willing to buy GM-free labelled products, shown separately for GM-free buyers and non-buyers. 1b shows the percentages of respondents in each country who say they buy GM-labelled products, again shown separately for GM-buyers and non-buyers.

Countries using the GM-free label (excluding Greece)

In contrast with the results described above for GM-labelled products, there was a significant difference between respondents who bought products with a GM-free label compared with those who did not. More GM-free buyers (76.8%) than non-buyers (52%) ($\chi^2=1.124$, $p<0.05$) claimed to know that products with GM-ingredients had to be labelled by law. Buyers of GM-free labelled products also read the detailed content listings of the food items they bought more often (65%) than did the non-buyers (47.9%) ($\chi^2=54.59$, $p<0.05$). Significantly more non-buyers (67.4%) than GM-free buyers (58.8%) said they did not know how to distinguish products containing GM-ingredients from conventional equivalents ($\chi^2=16.28$, $p<0.05$).

Both GM-free and non-buyers stated that the use of gene technology in food is very undesirable (59.7% for each). However, significantly more GM-free buyers (24%) than non-buyers (21.6%) did not know what to believe about the technology as far as food production is concerned ($\chi^2=7.76$, $p<0.05$). When asked if they favour the presence of GM-ingredients in their food, significantly more GM-free buyers (72.9%) than non-buyers (60.5%) said they were not in favour ($\chi^2=27.44$, $p<0.05$).

Overall, GM-free buyers (59.8%) were more reluctant to buy food that contains GM-ingredients than were non-buyers (49.7%); significantly more non-buyers (36.2%) than GM-free buyers (26.6%) did not know what to do ($\chi^2=18.42$, $p<0.05$).

GM-free buyers (58.6%) preferred to have food carrying the GM-free label. Although most of the non-buyers (51.3%) also welcomed this label, significantly more non-buying respondents said they did not know if they preferred that type of labelling ($\chi^2=32.25$, $p<0.05$). Of the buyers of GM-free labelled products, 24.4% did not particularly want this label and might have bought these products for other reasons.

Despite the fact that most respondents (62.6%) would not buy organic food if it contained

GM-ingredients, significantly more non-buyers (32.2%) than GM-free buyers (21%) were undecided about what they would do ($\chi^2=24.06$, $p<0.05$). With respect to buying GM-food if it had more perceived benefits than other food, 46.2% GM-free buyers and 37.5% non-buyers remained unwilling to buy it. Here again the non-buyers (34.7%) were significantly more undecided than GM-free buyers (24.8%) ($\chi^2=19.88$, $p<0.05$).

If food with GM-ingredients were produced in a more “environmentally-friendly” way, most of the GM-free buyers (49.8%) would still not buy it, while most of the non-buyers (42%) were undecided ($\chi^2=20.99$, $p<0.05$). But almost 20% of both, buyers of GM-free products and non-buyers, indicate that they would buy such foods.

Results from individual countries

Countries with products carrying “contains GM” labels

(i) The Czech Republic

Table 3. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	702	100
buyers	219	31.2
non-buyers	483	68.8
female	624	88.9
male	78	11.1

Table 4. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	45	6.4
30-39	145	20.7
40-49	124	17.7
50-64	218	31.1
65+	170	24.2
total	702	100

Both buyers and non-buyers (95.3%) stated they knew that, according to law, GM-food ingredients have to be labelled. The majority (63.1%) claimed to know how to distinguish GM-products from their conventional counterparts; 68.9% claimed to read the detailed ingredient listings of the products before deciding to buy. There was no significant difference between the answers of the buyers and the non-buyers.

Most Czech respondents said that it mattered whether they were buying food with GM-ingredients, non-buyers (55.9%) being slightly more concerned than buyers (47.9%); the difference was not significant. When shopping, most of the Czechs said they were not particularly careful about not buying GM-labelled foods, with buyers (67.6%) significantly less careful than non-buyers (57.6%) ($\chi^2=6.65$, $p<0.05$). When comparing Czech respondents' actual behaviour with their perceived behaviour, we found no significant difference between buyers and non-buyers of GM-labelled products; 49.3% of the buyers thought they did not buy GM-labelled food but actually they did. Of the non-buyers, 40.8% thought they had bought GM-products when actually they had not (see Fig. 1b).

There was a significant difference between buyers and non-buyers about whether they would buy organic food if it also contained GM-ingredients. Although more than half of the respondents (59.5%) said they would not do so, more GM-food buyers (32.4%) than non-buyers (26.3%) would buy the products ($\chi^2=7.24$, $p<0.05$). The majority of Czech respondents

(33.8%) were undecided whether food with GM-ingredients is safer for health; 35.2% of the respondents were plainly negative and 25.2% positive. Most respondents (57%) stated that other possible benefits of GM-foods were not sufficient reason for buying them.

Overall, the Czech respondents believed that the use of gene technology for food production was bad (39.5%) or very bad (42.9%), with no significant difference between buyers or non-buyers (see Fig. 2).

(ii) The Netherlands

Table 5. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	991	100
buyers	329	33.2
non-buyers	662	66.8
female	849	85.7
male	142	14.3

Table 6. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	74	7.5
30-39	217	21.9
40-49	244	24.6
50-64	314	31.7
65+	142	14.3
total	991	100

There were no significant differences between the answers given by the Dutch buyers and non-buyers. It was noticeable that for some questions there were fairly large percentages of respondents who were unable to provide an answer.

The majority of the Dutch respondents (60.9%) said they knew that GM-containing products have by law to be labelled; only 16% were able to distinguish GM-products from conventional ones. Moreover, 62.7% of the respondents said they did not read the detailed content lists of products before buying them.

For 38%, buying GM-labelled products would be a matter for concern, although 69.7% said they were not careful not to buy them. Most Dutch respondents said they did to know whether or not they actually bought GM-labelled products. Comparing their own perceived and actual behaviours showed that 31.6% of buyers thought they did not buy GM-food while 11.3% of the non-buyers thought they did (see Fig. 1b).

Almost half (47.4%) the Dutch respondents would not buy organic food if it also contained GM-ingredients; only a small percentage (14%) would do so. About a third (34.7%) of the Dutch were uncertain whether they regarded food with GM-ingredients as safer for health; almost the same proportion (30.4%) did not know. Others considered GM to be either bad (9.8%) or very bad (22%) for their health. Most respondents (55.1%) considered other possible benefits of GM offered no justification for their purchase.

Overall, the Dutch respondents believed the use of gene technology to be bad (42.8%) or very bad (25.8%); almost one third did not know (see Fig. 2).

(iii) Poland

Table 7. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	584	100
buyers	83	14.2
non-buyers	501	85.8
female	543	93
male	41	7

Table 8. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	70	12
30-39	83	14.2
40-49	129	22.1
50-64	199	34.1
65+	103	17.6
total	584	100

Overall there were no significant differences between the answers given by the Polish buyers and non-buyers. Almost all (94.2%) Polish respondents said they knew that food containing GM-ingredients had legally to be labelled; 62.8% said they did not know how to distinguish them from conventional products, while 69.2% claimed to read the detailed content listings before buying a product.

Most Polish respondents (74.1%) said that they cared if the food they bought contained GM-ingredients buy; nevertheless 48.6% were not careful to avoid food with GM-ingredients. Most Poles (67.6%) thought they did not buy food with GM-ingredients; 74.7% of the buyers who thought they did not buy GM-food with GM-ingredients did in fact do so. Vice versa, 27.5% of the people who actually do not buy food with GM-ingredients thought that they did (Fig. 1b).

The majority of the Polish respondents (59.4%) would not buy organic food if it also contained GM-ingredients. Many (34.4%) were uncertain whether to regard GM- food as safer for health but their answers tend to be more negative (41.6% total said it was bad or very bad) than positive (16.3% total said it was good or very good). Other potential benefits (improved taste, lower price, healthier or more environmental friendly cultivation) were not considered good reasons for buying food with GM-ingredients and 58.9% of the respondents said they would not do so.

None of the Polish respondents considered the use of gene technology for food to be desirable, most (46.6%) regarding it as very undesirable (see Fig. 2).

(iv) Spain

Table 9. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	563	100
buyers	150	26.6
non-buyers	413	73.4
female	549	97.5
male	14	2.5

Table 10. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	11	2
30-39	115	20.4
40-49	179	31.8
50-64	174	30.9
65+	84	14.9
total	563	100

Overall there were no significant differences in Spain between the answers given by buyers and non-buyers. Most respondents (73.7%) claimed they knew about the legal requirement to label GM-products; even though 79.6% of them did not know how to recognise products with GM, the majority (53.8%) claimed to read the list of ingredients before buying.

The majority of the Spanish respondents (46.4%) did not care if the foods they bought contained GM-ingredients, with 38.7% saying they were very careful not to buy such food. Although the majority (62.5%) of respondents thought they did not buy food with GM ingredients, the data showed that 67.3% of them actually did buy such products. On the other hand, 14.8% of the respondents who did not buy GM-food thought they did (see Fig. 1b).

A majority (53.8%) of Spanish respondents would not buy organic food if it also contained GM-ingredients. Most (50.3%) neither agreed nor disagreed that GM-food is safer for health but more people disagreed than agreed. Other benefits of GM-products were not considered valid reasons for buying it and 57.5% of people said they would not do so.

Most (44%) Spaniards regarded that the use of gene technology in food as very bad; not a single one considered it to be good (Fig. 2).

(v) United Kingdom

Table 11. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	548	100
buyers	0	0
non-buyers	548	100
female	385	70.3
male	163	29.7

Table 12. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	78	14.2
30-39	120	21.9
40-49	112	20.4
50-64	112	20.4
65+	126	23
total	548	100

It was not possible to compare differences between UK buyers and non-buyers of GM-labelled products. Despite the fact that there are GM-products on sale in the UK, they were

not in the “fast-moving consumer goods” and so did not register on the GfK consumer panel survey in that country.

Most (65.3%) UK respondents said they knew about the legal requirement to label GM-food products, with only 27.4% claiming to be able to tell them apart from non-GM foods. A small majority (52.2%) said they read the detailed content listings on the packages before buying.

The majority of the British (48%) cared whether their foods contained GM-ingredients but 44.9% took no measures to avoid them. Only a small percentage (12.6%) thought they bought food with GM-ingredients although in reality they did not; 30.7% did not know (see Fig. 1b).

Of the UK respondents, 47% disagreed (21.5% of them strongly) when asked whether they would buy food with GM-ingredients if it was safer and healthier; 39.8% were undecided. Other perceived benefits would not encourage British panel members to buy GM-foods; the percentages against were for health benefits 62.8%, lower prices 56.2%, better taste 58.8% and environmentally friendly 59.1%. Just as for the respondents in the other countries polled, the majority of the British respondents considered gene technology very bad for food production (Fig. 2).

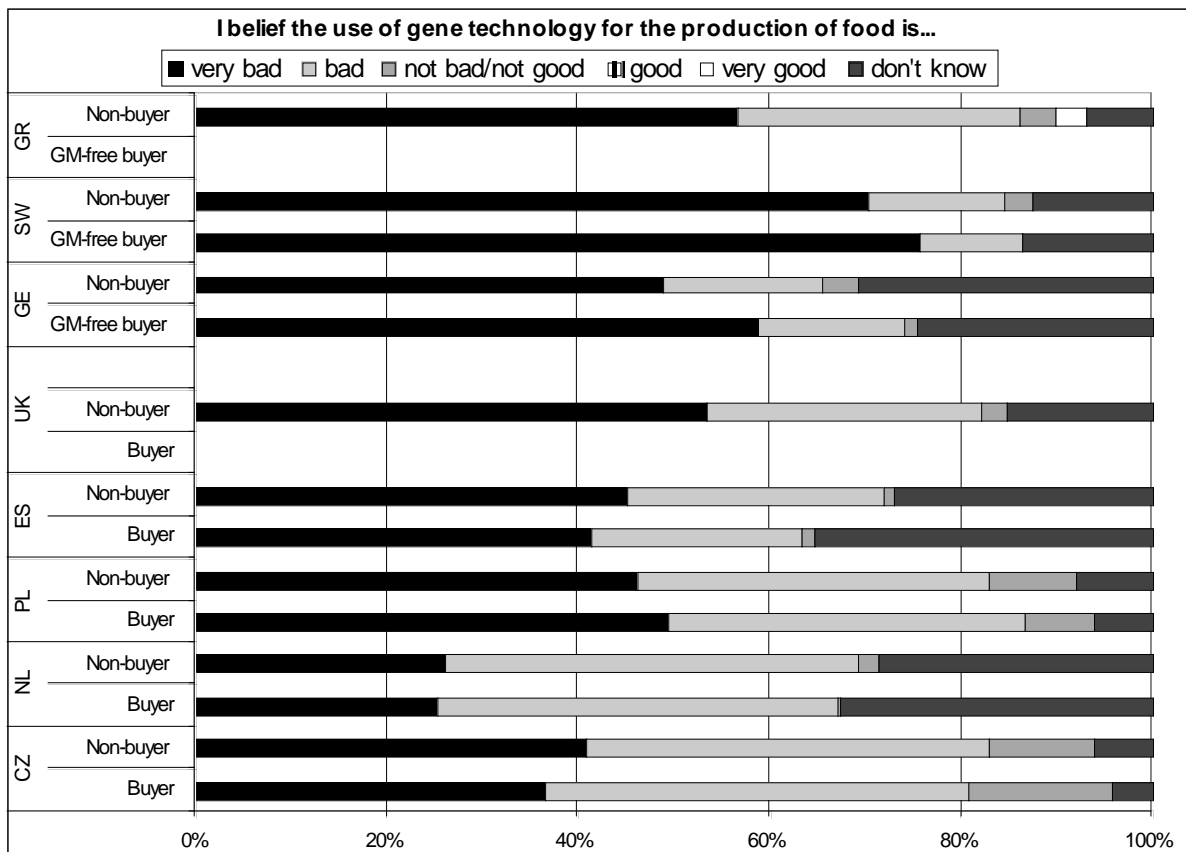


Fig. 2. the percentages for the answers given to the question if people think the use of gene technology is good/bad given for all countries divided in buyers and non-buyers.

Countries with products carrying “GM-free” labels

(i) Germany

Table 13. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	1096	100
buyers	491	44.8
non-buyers	605	55.2
female	692	63.1
male	404	36.9

Table 14. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	91	8.3
30-39	196	17.9
40-49	235	21.4
50-64	318	29
65+	256	23.4
total	1096	100

Most Germans (79.2%) also knew of the legal obligation to label GM-food, with 59.9% claiming to be able to tell a GM-product from a conventional one; in this regard buyers and non-buyers of GM-free products were equal in their responses. A majority said they read the detailed content listings before buying a particular food item, with significantly more GM-free buyers (64.8%) saying so than did non-buyers (52.6%) ($\chi^2=17.785$, $p<0.05$).

Significantly more GM-free buyers (58.7%) than non-buyers (48.9%) regarded the use of gene technology for food as very bad ($\chi^2=15.083$, $p<0.05$) (figure 2); 70% both of buyers and non-buyers were against the use of GM-ingredients in food, with the majority (58.4%) saying they would not buy GM-food. Significantly more GM-free buyers (58.8%) than non-buyers (49.3%) preferred buying GM-free-labelled products ($\chi^2=9.243$, $p<0.05$). Although 49.3% of the non-buyers said they preferred the GM-free-label, they did not necessarily buy such products while 25.7% of GM-free buyers did not prefer this label and might have bought the products for other reasons.

Around 70% both of buyers and non-buyers would reject organic food with GM-ingredients. Possible benefits of GM-products were rejected by 44.7% of both groups while 30.6% thought they would buy such GM-products and 24.7% did not know what they would do. Environmental benefits were still no reason for a majority of 47.6% of the German respondents to buy GM-food. Here we found a significant difference between GM-free buyers and non-buyers ($\chi^2=6.101$, $p<0.05$). More GM-free-buyers (50.9%) than non-buyers (43.6%) would also probably not buy GM-food even if produced in a more environmental friendly fashion.

(ii) Greece

Table 15. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n		
buyers	0	0
non-buyers	500	100
female	348	69.6
male	152	30.4

Table 16. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	49	9.8
30-39	102	20.4
40-49	100	20
50-64	167	33.4
65+	82	16.4
total	500	100

There are no products labelled “GM-free” in Greece so we could not consider differences between buyers and non-buyers.

Most Greek respondents (91.4%) said they knew that, by law, GM-products have to be labelled but 62.8% could not tell them apart from conventional ones. The majority (64.2%) said they read labels before purchasing.

Although most (56.6%) respondents in Greece believed the use of gene technology for food production to be very bad, a small proportion (3.2%) took a contrary view and considered it to be very good (Fig. 2). Most (87.6%) Greeks did not favour the use of GM-ingredients in their food, with 89.4% saying they would not buy them. A high proportion (88.2%) preferred to buy food carrying a GM-free label.

Most (82.4%) Greek respondents would not buy organic food containing GM-ingredients nor would the existence of taste, price and health benefits tempt them: most (70.4%) would still not buy nor would 67.6% do so if there were environmental benefits to be had.

(iii) Sweden

Table 17. Frequency and percentages of buyers and non-buyers, males and females

	frequency	%
n	539	100
buyers	502	93.1
non-buyers	37	6.9
female	368	68.3
male	171	31.7

Table 18. Frequency and percentages as a function of age distribution of the respondents

age brackets	frequency	%
up to 29	58	10.8
30-39	88	16.3
40-49	124	23
50-64	190	35.3
65+	79	14.7
total	539	100

Almost half (48.2%) of the Swedish respondents said they did not think the law required the labelling of foods containing GM-ingredients; 25.6% did not know while 72.4% could not tell the difference between products containing GM-ingredients and conventional products. There

was a significant difference between buyers and non-buyers of products with GM-free labels with respect to reading labels ($\chi^2=8.518$, $p<0.05$): significantly more buyers (67.6%) than non-buyers (43.4%) said they did read the detailed content listings before buying a particular food item; some 53.6% of non-buyers said that they often did not read labels.

As in the other Member States, a majority (70.7%) of Swedish respondents thought the use of gene technology in food production to be very bad (70.7%) (Fig. 2). Overall, 56% both of buyers and non-buyers of products with GM-free labels opposed to the use of GM-ingredients in food with, however, significantly more buyers (73%) than non-buyers (54.8%) against ($\chi^2=5.889$, $p<0.05$). When asked whether they would buy food with GM ingredients, most respondents were uncertain (46.2%) while 44.2% said they would not buy such foods. A clear majority (54%) of the Swedes would prefer to buy foods with a GM-free label, with a greater preference among buyers (64.9%) than non-buyers (53.2%); 32.4% of the buyers did not express a preference.

Nearly half (47.7%) would not buy organic food containing GM-ingredients, with almost as many (44.3%) not knowing what to do. A somewhat similar result was obtained for a willingness to buy GM-products if taste, price and health were clear: 33.2% would not buy but 43.4% did not know what they would do. That uncertainty was even greater if GM-food also offered environmental benefits: 46.9% remained uncertain while 35.8% would still not buy.

Conclusions

Countries using the GM-label

The people who responded to our GfK consumer panel poll were typical food shoppers and therefore did not form a representative group of their countries' populations. The findings in this study may therefore be at variance with polls which have looked at total populations.

Over three-quarters of all respondent in countries in which GM-labelled-products can be found on supermarket shelves say they know that labelling of GM-products is mandatory. However, 60% of these people say they can not tell whether or not a product contains GM-ingredients. This might reflect the fact that fewer than 50% of our respondents read labels before buying a food item. Alternatively, it might mean that the information on the label is misunderstood or misinterpreted. Another reason may be that people are simply not interested: that seems to be confirmed by the finding that only 30% of the respondents were careful never to buy foods with GM-ingredients.

By and large, consumers in these countries continue to display a negative attitude towards genetically modified ingredients in food products and gene technology in particular. When prompted as to whether they would buy GM-foods, with such benefits as lower prices, healthier or tastier, or grown under "environmental-friendly" regimes, most people remained negative. This is not reflected in the focus groups results where people seemed more positive about GM-foods with specific benefits. It would be interesting to further explore what the reasons are for such differences.

The fact that GM-labelled products are available and actually bought, shows that there is indeed a market for such products. Our results may indicate that this market might even be large than often perceived as 20% of non-buyers thought they were already buying GM-foods,

and around 30% did not even know whether or not they were. Interestingly, the data showed no significant differences between buyers and non-buyers. Were the buyers not aware of what they were buying in spite of claiming both to read the labels and to understand what they meant? Or did the questions asked in the poll simply have no bearing on the way people behave in the bustle of doing the daily or weekly shopping for food?

The answers show another uncertainty. Since expressed opinions differed so little between buyers and non-buyers of GM-products, it is quite possible that there is essentially no difference between the two groups except for the non-buyers having had no particular interest in the rather small ranges of products available in each of the five countries carrying a GM-label. If a consumer did not wish to buy soya cooking oil or margarine, it mattered little whether that oil or margarine was derived from a GM source.

These interpretations of our findings suggest that most people are actually neither really interested in, nor very alert to the presence of GM-ingredients or -products. Polls elsewhere have shown a low and declining level of concern in the GM issue, with just a few percent of people asked unprompted to list their concerns about food (3). It is only when they were prompted, and GMOs brought specifically to their attention, that they showed an antipathy. This is also confirmed by the results of the Focus Group discussions.

The differences between people's opinion and behaviour was also apparent in what they said with respect to how much they cared about buying or not buying GM-food, and how careful they were. As one would expect, non-buyers of GM-labelled food expressed more concern than buyers, suggesting that people in our sample who never buy any GM-products would be more careful to avoid those products than those who bought them. This was, however, not the case: almost three out of every four of both buyers and non-buyers did not take care to avoid food labelled as containing GM-ingredients.

This observation also indicates that what people say differs from what they do. When asked whether they had bought GM-food, half of our respondents said they had not. Yet the barcode analyses of their purchases showed that half of them were wrong and they had indeed bought such products. Perhaps they did not know what they had bought. Some people also thought they had bought GM-food when, in fact, they had not. Our data is not sufficiently extensive to probe more deeply into the minds of the shoppers but *we may reasonably conclude:*

- that whatever they may say, most people do not actively avoid GM-food, suggesting that they are not greatly concerned with the GM issue;
- the way people respond to prompting via a questionnaire is no reliable guide to what they do in a grocery store.

Countries using "GM-free" labels (but excluding Greece)

In contrast to the lack of difference between buyers and non-buyers of GM-products in the five countries above, our data show a significant difference between buyers and non-buyers of GM-free-labelled products. This suggests that, for the latter, buying GM-free-products is more of a conscious choice: the products are bought because of the label.

Although there are no GM-labelled products for sale in these countries, most people said they knew that GM-products had to be labelled. Despite that, most people in effect did not know how to use such labels and could not distinguish GM-labelled-products from conventional

ones; that is perhaps not surprising as respondents in those countries would encounter no GM-labelled products in their home markets. Buyers of GM-free labelled products not only say they read product labels more often than do non-buyers but also more often than buyers of GM-labelled products; this supports the idea that buying GM-free is a more conscious decision.

In countries where GM-free labelled products are sold, people have a slightly more negative opinion towards the use of gene technology for food than in countries with GM-products on sale. This may reflect the differences between countries generally found by other surveys such as the Eurobarometer. When prompted, 55% of both GM-free and non-buyers preferred buying products with a GM-free label but 25% of the people who bought GM-free labelled products did not necessarily buy because of that label and so presumably had other reasons for their purchases. Might such consumers, both buyers and non-buyers, be potential customers for GM-labelled food if it were available?

In countries with GM-free labelling, people said they would not consider buying GM-organic foods. This question, however, was rather misleading and inconclusive as it does not reveal how many people would reject organic foods on other grounds. When asked whether people would buy GM-foods if they were to provide benefits, more than half of the respondents said they would buy or were undecided. This suggests that there is in these countries a sizeable potential market for GM products at present unsatisfied.

Our results suggest that buying GM-free labelled products is a determined choice and that there may be also be a market for foods with GM-ingredients in the countries which are presently not selling GM-food products.

Comments on individual countries

The following summary aggregates some distinguishing findings in individual countries in which GM-labelled foods are sold, followed by those using GM-free labels.

All countries using GM labels

Czech Republic

Compared with the other countries involved in CONSUMERCHOICE project, the Czech Republic is the country with the highest market penetration (13.7%) for GM-labelled products. Since this penetration is based on only eight products we may conclude that these GM products are popular.

The Netherlands

Of the countries surveyed, The Netherlands has the greatest variety of GM-labelled-products on sale. Only a small minority of respondents could recognise GM-labelled-products while nearly two-thirds said they did not read labels. But the Dutch do not seem to mind: a majority do not know whether or not they bought GM-food and nearly 70% said they did not take care to avoid it.

Dutch opinion overall toward the use of gene technology in food was negative but their answers showed great uncertainties. For most questions there were many “don’t know” or

“neither agree nor disagree” answers. Perhaps they were more honest than others in filling in their questionnaires. We do conclude that they appeared generally more open towards new technologies but confirmation of that view would require further inquiry.

Poland

Poland had a market penetration of 2.7% based on only one product (soya cooking oil). We have therefore to be careful when interpreting the data. Because of the presence of only one product it is not surprising that most respondents did not know how to distinguish a GM-labelled-product from a conventional one as they hardly ever come across any, although the high proportion of people who claimed to read the labels suggests that they would recognise such products if they found them.

Spain

Spain is the only country in this project with a large area under commercial cultivation with GM-crops. These GfK results suggest that Spanish shoppers seem to bother little about whether or not the food they buy is of GM-origin. But when prompted, nobody considered gene technology for food products a good thing.

United Kingdom

For the United Kingdom we could not compare people’s perceived with their actual behaviour because none of the GM-labelled products on sale showed up in the consumer panel database. A possible explanation is that the panel data was restricted to fast-moving consumer goods whereas the GM-products on sale in UK stores were mainly cooking oil in large containers bought infrequently by any individual shopper.

Countries using GM-free labels

Germany

Although our data suggest that buying GM-free labelled products is a considered choice, 25% of purchases buy these products for other reasons than avoiding GM as they claim not to favour particularly products carrying a GM-free label.

Sweden

There are no GM-labelled products for sale in Sweden and most people there did not know GM-products had to be labelled by law or how to recognise GM-products. Surprisingly almost half the respondents could not say if they would buy GM-labelled-food were it was available; thus there may be a market for GM-products. The prospect of consumer benefits resulting from the use of gene technology did not remove Swedish doubts about whether to buy such products.

Greece

Surprisingly the one country included in this survey where no GM- nor GM-free-labelled products are to be found is the only country where a small percentage of people considered gene technology for the use of food production to be very good. Other questions showed

similar responses to those in the other countries.

Overall conclusions

There are many subtle differences between the countries which participated in this survey as one would expect on the basis of earlier findings such as the Eurobarometer. In the Eurobarometer 2005 (1) the outright and risk-tolerant support for GM-food ranged from 74% in Spain to only 12 % in Greece.

Overall, people seem not to be able to recognise GM-food in spite of the labelling requirements. But this does not seem to be a problem as people are in general are not careful to avoid these products, a conclusion supported by the little attention paid to labels. However people do react differently towards GM-free labelled products suggesting that those products are chosen with greater thought.

Although people's general expressed attitude towards gene technology and GM-ingredients in food is negative, 50% both of buyers and non-buyers think they do buy GM-food or do not know whether they buy them. Shoppers certainly behave differently from what they say they would do. One in three of the respondents were wrong in their perceptions about what they bought, while another third did not know.

We conclude that one must be very careful in drawing conclusions about behaviour from surveys which focus on opinions and intentions. Our findings should serve as a warning against using the Eurobarometer and similar polling data as justifications for policy making in the retail food market.

References:

1. Special Eurobarometer: *Europeans and Biotechnology in 2005*, 244b, July 2006 Wave 64.3
2. TNS NIPO, RTL Nederland Interactief, RTL Nieuws.nl, 25 februari 2007 ([http://www.rtl.nl/\(/actueel/rtlnieuws/\)/components/actueel/rtlnieuws/2007/02_februari/25/binnenland/0225_1900_gen_voedsel.xml](http://www.rtl.nl/(/actueel/rtlnieuws/)/components/actueel/rtlnieuws/2007/02_februari/25/binnenland/0225_1900_gen_voedsel.xml))
3. *Consumer Attitudes to Food Standards: Wave 8. UK Report Final*. Food Standards Agency (24.2.08) (<http://www.food.gov.uk/multimedia/pdfs/cas2007ukreport.pdf>)

The work involved in this chapter was carried out mainly within the research programme of the Kluyver Centre for Genomics of Industrial Fermentation which is part of the Netherlands Genomics Initiative.

APPENDIX 1: QUESTIONNAIRES

Questions for countries with GM products on sale (Czech Republic, Netherlands, Poland, Spain, UK)

1. According to law, does food with GM ingredients have to be labelled? (K)
yes/no/don't know
2. Before deciding to buy a particular food item I always read (or have previously read) the detailed contents listing on the package. (B)
yes/no/don't know
3. I know how to tell whether a product contains GM ingredients (1). (K)
yes/no/don't know
4. I don't care if the food I buy contains GM ingredients. (A)
yes/no/don't know
5. I buy food labelled as containing GM ingredients. (B)
yes/no/don't know
6. I would buy organic food even if it also contained GM ingredients (A)
yes/no/don't know
7. I am careful never to buy food labelled as containing GM ingredients (B)
yes/no/don't know
8. Compared with other foods, I regard those containing GM ingredients as being safer for health (1). (R)
answers graded on a ten point scale
9. I buy food with GM ingredients because, compared with other food, it is healthier,
10. Cheaper, tastier or produced in a more environmental friendly manner (2). (R)
yes/no/don't know
11. In general I believe that the use of gene technology in food production is...(3) (A)
answers graded on a ten point scale

Approval Scale

totally disagree/disagree/nor agree/nor disagree/agree/totally agree

Valuation Scale

very bad/ bad/very unsatisfactory/unsatisfactory/ OK /more than OK/good/very good/
excellent

A = Attitude

B = Behaviour

K = Knowledge

R = Reason

Questions for countries with no GM-products on sale (Germany, Greece, Sweden)

1. According to law, does food with GM ingredients have to be labelled? (K)
yes/no/don't know
2. Before deciding to buy a particular food item I always read (or have previously read) the detailed contents listing on the package. (B)
yes/no/don't know
3. I know how to tell whether a product contains GM ingredients (1). (K)
yes/no/don't know
4. I am in favour of the use of GM ingredients in food. (A)
yes/no/don't know
5. I would buy food containing GM ingredients. (B)
yes/no/don't know
6. I prefer to buy foods carrying a "GM-free" label. (B)
yes/no/don't know
7. I would buy organic food even if it also contained GM ingredients. (A)
yes/no/don't know
8. I would buy food with GM ingredients if it were healthier ,cheaper or tastier than other food. (R)
yes/no/don't know
9. I would buy food with GM ingredients if it were produced in a more environmental friendly way than other food (2). (R)
yes/no/don't know
10. In general I believe that the use of gene technology in food production is good/bad (3). (A)
answers graded on a ten point scale

Approval Scale

totally disagree/disagree/nor agree/nor disagree/agree/totally agree

Valuation Scale

very bad/ bad/very unsatisfactory/unsatisfactory/ OK /more than OK/good/very good/
excellent

A= Attitude

B= Behaviour

K= Knowledge

R= Reason

References

1. *From:* TNS NIPO, RTL Nederland Interactief, RTL Nieuws.nl, 25 februari 2007
([http://www.rtl.nl/\(/actueel/rtlnieuws/\)/components/actueel/rtlnieuws/2007/02_februari/25/binnenland/0225_1900_gen_voedsel.xml](http://www.rtl.nl/(/actueel/rtlnieuws/)/components/actueel/rtlnieuws/2007/02_februari/25/binnenland/0225_1900_gen_voedsel.xml))
2. *From:* European Commission (May 2006). *Europeans and Biotechnology in 2005:*

Patterns and Trends Eurobarometer 64.3 6

3. *From: Spence, A. & Townsend, E. (June 2006) Examining consumer behaviour towards genetically modified (GM) food in Britain. Risk Analysis, 26(3), 657-670.*

APPENDIX 2: TABLES

Chi-square analyses between buyers and non-buyers for all countries where GM labelled products are for sale (excl UK)

	chi- square	df	sig.		%		
					yes	no	don't know
Q1				buyer	76.7	3.7	19.6
	2.882	2	0.237	non-buyer	79.6	3.2	17.2
				total	78.8	3.3	17.9
Q2				buyer	52.0	45.3	2.7
	2.405	2	0.3	non-buyer	54.9	42.9	2.1
				total	54.1	43.6	2.3
Q3				buyer	28.6	59.3	12.2
	0.884	2	0.643	non-buyer	30.4	57.9	11.8
				total	29.9	58.3	11.9
Q4				buyer	39.6	42.3	18.2
	14.433	2	0.001*	non-buyer	34.7	50.2	15.1
				total	36.1	48.0	16.0
Q5				buyer	21.5	48.0	30.5
	4.222	2	0.121	non-buyer	22.9	50.5	26.6
				total	22.5	49.8	27.7
Q6				buyer	20.6	52.6	26.8
	1.829	2	0.401	non-buyer	20.9	54.7	24.3
				total	20.8	54.2	25
Q7				buyer	26.1	59.4	14.5
	9.709	2	0.008*	non-buyer	32.1	54.1	13.8
				total	30.5	55.6	14
Q9				buyer	15.6	56.6	27.8
	0.975	2	0.614	non-buyer	16.8	56.9	26.3
				total	16.5	56.8	26.7

* Significant

							%			
	chi-square	df	sig.		1 completely disagree	2 disagree	3 neither agree/ nor disagree	4 agree	5 completely agree	9 don't know
Q8				buyer	11.7	21.3	41.7	6.7	3.7	15
	13.919	5	0.016*	non-buyer	15.2	23.1	35.9	8.1	4.2	13.5
				total	14.2	22.6	37.5	7.7	4.1	13.9
					1 very bad	2 bad	3 neither bad, nor good	4 good	5 very good	99 don't know
Q10				buyer	34.1	38.3	5.4	0	0	22.3
	7.92	3	0.048*	non-buyer	38.2	38.1	5.6	0	0	18.1
				total	37.1	38.2	5.5	0	0	19.2

* Significant

APPENDIX 3: TABLES

Chi-square analyses between buyers and non-buyers for all countries (except Greece) where GM-free-labelled products are on sale

	chi-square	df	sig.		%		
					yes	no	don't know
Q1				GM-free buyer	76.8	9.8	13.4
	1.12e+02	2	0.000*	non-buyer	52	28.7	19.3
				total	61.7	21.3	17
Q2				GM-free buyer	65.0	28.4	6.6
	54.592	2	0.000*	non-buyer	47.9	46.7	5.3
				total	54.6	39.5	5.8
Q3				GM-free buyer	11.4	58.8	29.8
	16.282	2	0.000*	non-buyer	11.4	67.4	21.2
				total	11.4	64	24.5
Q4				GM-free buyer	7.2	72.9	19.9
	27.437	2	0.000*	non-buyer	8.8	60.5	30.7
				total	8.2	65.4	26.4
Q5				GM-free buyer	13.6	59.8	26.6
	18.415	2	0.000*	non-buyer	14.0	49.7	36.2
				total	13.9	53.7	32.5
Q6				GM-free buyer	58.6	24.4	17
	32.245	2	0.000*	non-buyer	51.3	19.4	29.3
				total	54.1	21.4	24.5
Q7				GM-free buyer	10.3	68.7	21
	24.06	2	0.000*	non-buyer	9.1	58.7	32.2
				total	9.6	62.6	27.8
Q8				GM-free buyer	28.9	46.2	24.8
	19.875	2	0.000*	non-buyer	27.8	37.5	34.7
				total	28.2	40.9	30.9
Q9				GM-free buyer	18.9	49.8	31.2
	20.985	2	0.000*	non-buyer	18.3	39.8	42
				total	18.5	43.7	37.8

* Significant

				%						
	chi-square	df	sig.		1 very bad	2 bad	3 not bad, not good	4 good	5 very good	99 don't know
Q10				buyer	34.1	38.3	5.4	0	0	22.3
	7.76	3	0.051	non-buyer	38.2	38.1	5.6	0	0	18.1
				total	37.1	38.2	5.5	0	0	19.2

APPENDIX 4: COMPARISONS BETWEEN BUYERS AND NON-BUYERS IN COUNTRIES WHERE GM- LABELLED PRODUCTS ARE ON SALE

Chi-square analyses of Questions 1-10

	country	chi-square	df	sig.		%		
						yes	no	don't know
Q1	Czech Republic				buyer	96.8	1.8	1.4
		1.609	2	0.447	non-buyer	94.6	3.1	2.3
					total	95.3	2.7	2
	Netherlands				buyer	59.9	6.7	33.4
		2.058	2	0.357	non-buyer	61.5	4.5	34
					total	60.9	5.2	33.8
	Poland				buyer	95.2	0	4.8
		1.567	2	0.457	non-buyer	94	1.8	4.2
					total	94.2	1.5	4.3
	Spain				buyer	74	2	24
		0.2	2	0.905	non-buyer	73.6	2.7	23.7
					total	73.7	2.5	23.8
	UK*				buyer	-	-	-
					non-buyer	65.3	10.4	24.3
Q2	Czech Republic				buyer	67.1	32.9	0
		1.004	2	0.605	non-buyer	69.8	30	0.2
					total	68.9	30.9	0.1
	Netherlands				buyer	34.7	62	3.3
		1.771	2	0.412	non-buyer	35	63	2
					total	34.9	62.7	2.4
	Poland				buyer	68.7	31.3	0
		0.358	2	0.836	non-buyer	69.3	30.3	0.4
					total	69.2	30.5	0.3
	Spain				buyer	58.7	34.7	6.7
		2.072	2	0.355	non-buyer	52.1	41.2	6.8
					total	53.8	39.4	6.7
	UK*				buyer	-	-	-
					non-buyer	52.2	45.6	2.2

*For the UK there are no totals and chi-square analyses because no comparison was possible made between buyers and non-buyers.

						%		
	country	chi-square	df	sig.		yes	no	don't know
Q3	Czech Rep.				buyer	61.2	38.8	0
		4.113	2	0.128	non-buyer	64	34.6	1.4
					total	63.1	35.9	1
	Netherlands				buyer	16.1	60.8	23.1
		0.64	2	0.726	non-buyer	16	58.6	25.4
					total	16	59.3	24.6
	Poland				buyer	36.1	63.9	0
		1.686	2	0.43	non-buyer	35.3	62.7	2
					total	35.4	62.8	1.7
	Spain				buyer	4	83.3	12.7
		2.997	2	0.223	non-buyer	8	78.2	13.8
					total	6.9	79.6	13.5
	UK				buyer	-	-	-
					non-buyer	27.4	49.6	23
Q4	Czech Rep.				buyer	48.4	47.9	3.7
		3.325	2	0.115	non-buyer	41.8	55.9	2.3
					total	43.9	53.4	2.7
	Netherlands				buyer	34.7	34	31.3
		3.352	2	0.187	non-buyer	31.3	40	28.7
					total	32.4	38	29.6
	Poland				buyer	20.5	77.1	2.4
		0.454	2	0.797	non-buyer	23.4	73.7	3
					total	22.9	74.1	2.9
	Spain				buyer	48	32.7	19.3
		0.863	2	0.65	non-buyer	45.8	31.2	23
					total	46.4	31.6	22
	UK				buyer	-	-	-
					non-buyer	32.3	48	19.7

						%		
	country	chi-square	df	sig.		yes	no	don't know
Q5	Czech Rep.				buyer	44.3	49.3	6.4
		1.106	2	0.575	non-buyer	40.8	51.1	8.1
					total	41.9	50.6	7.5
	Netherlands				buyer	12.2	31.6	56.2
		0.159	2	0.923	non-buyer	11.3	31.6	57.1
					total	11.6	31.6	56.8
	Poland				buyer	18.1	74.7	7.2
		3.33	2	0.189	non-buyer	27.5	66.5	6
					total	26.2	67.6	6.2
	Spain				buyer	10.7	67.3	22
		2.39	2	0.303	non-buyer	14.8	60.8	24.5
					total	13.7	62.5	23.8
	UK				buyer	-	-	-
					non-buyer	12.6	56.8	30.7
Q6	Czech Rep.				buyer	32.4	59.8	7.8
		7.243	2	0.027*	non-buyer	26.3	59.4	14.3
					total	28.2	59.5	12.3
	Netherlands				buyer	13.4	47.4	39.2
		0.206	2	0.902	non-buyer	14.4	47.4	38.2
					total	14	47.4	38.5
	Poland				buyer	32.5	56.6	10.8
		1.122	2	0.571	non-buyer	27.1	59.9	13
					total	27.9	59.4	12.7
	Spain				buyer	12.7	51.3	36
		4.524	2	0.104	non-buyer	17.7	54.7	27.6
					total	16.3	53.8	29.8
	UK				buyer	-	-	-
					non-buyer	18.1	59.3	22.6

* Significant

	country	chi-square	df	sig.		1 completely disagree	2 disagree	3 neither agree/nor disagree	4 agree	5 completely agree	9 don't know
Q10	Czech Rep.				buyer	12.8	17.8	38.8	15.5	9.6	5.5
		4.538	5	0.475	non-buyer	15.1	22.2	31.5	14.9	10.4	6
					total	14.4	20.8	33.8	15.1	10.1	5.8
	Netherlands				buyer	7.3	21.3	39.5	1.8	0.9	29.2
		7.768	5	0.169	non-buyer	11	22.4	32.3	2.7	0.6	31
					total	9.8	22	34.7	2.4	0.7	30.4
	Poland				buyer	22.9	16.9	37.3	9.6	6	7.2
		2.01	5	0.848	non-buyer	19.2	22.8	33.9	10.8	5.6	7.8
					total	19.7	21.9	34.4	10.6	5.7	7.7
	Spain				buyer	13.3	28.7	53.3	2.7	0	2
		6.4	5	0.269	non-buyer	17.2	25.9	49.2	5.6	1.2	1
					total	16.2	26.6	50.3	4.8	0.9	1.2
	UK				buyer	-	-	-	-	-	-
					non-buyer	1.3	4.9	39.8	25.5	21.5	6.9

								%			
	country	chi-squared	df.	sig.		1 very bad	2 bad	3 neither bad nor good	4 good	5 very good	99 don't know
Q10	Czech Rep.				buyer	36.5	44.3	15.1	0	0	4.1
		4.342	3	0.227	non-buyer	40.8	42.2	10.8	0	0	6.2
					total	39.5	42.9	12.1	0	0	5.6
	Netherlands				buyer	25.2	41.9	0.3	0	0	32.5
		5.508	3	0.138	non-buyer	26.1	43.2	2	0	0	28.7
					total	25.8	42.8	1.4	0	0	30
	Poland				buyer	49.4	37.3	7.2	0	0	6
		0.833	3	0.842	non-buyer	46.1	36.7	9.2	0	0	8
					total	46.6	36.8	8.9	0	0	7.7
	Spain				buyer	41.3	22	1.3	0	0	35.3
		4.037	3	0.258	non-buyer	45	26.9	1	0	0	27.1
					total	44	25.6	1.1	0	0	29.3
	UK				buyer	-	-	-	-	-	-
					non-buyer	53.5	28.5	2.9	0	0	15.1

APPENDIX 5: COMPARISONS BETWEEN BUYERS AND NON-BUYERS IN COUNTRIES WHERE GM-FREE LABELLED PRODUCTS ARE ON SALE

Chi-square analyses of Questions 1-10

	country	chi-square	df	sig.		%		
						yes	no	don't know
Q1	Germany	0.968	2	0.616	GM-free buyer	79.8	8.3	11.9
					non-buyer	78.4	7.7	13.8
					Total	79.2	8	12.8
	Sweden	3.748	2	0.154	GM-free buyer	27	35.1	37.8
					non-buyer	26.1	49.2	24.7
					Total	26.2	48.2	25.6
	Greece✘				GM-free buyer	-	-	-
					non-buyer	91.4	7.4	1.2
Q2	Germany	17.785	2	0.000*	GM-free buyer	64.8	28.2	7
					non-buyer	52.6	39.7	7.8
					Total	59.3	33.3	7.3
	Sweden	8.518	2	0.014*	GM-free buyer	67.6	32.4	0
					non-buyer	43.4	53.6	3
					Total	45.1	52.1	2.8
	Greece				GM-free buyer	-	-	-
					non-buyer	64.2	35.6	0.2
Q3	Germany	2.245	2	0.325	GM-free buyer	11.5	58.1	30.4
					non-buyer	11.2	62.2	26.5
					Total	11.4	59.9	28.7
	Sweden	0.23	2	0.891	GM-free buyer	10.8	70.3	18.9
					non-buyer	11.6	72.5	15.9
					Total	11.5	72.4	16.1
	Greece				GM-free buyer	-	-	-
					non-buyer	35.8	62.8	1.4
Q4	Germany	5.477	2	0.065	GM-free buyer	7.6	72.9	19.4
					non-buyer	10	66.5	23.5
					Total	8.7	70	21.3
	Sweden	5.889	2	0.053*	GM-free buyer	0	73	27
					non-buyer	7.6	54.8	37.6
					Total	7.1	56	36.9
	Greece				GM-free buyer	-	-	-
					non-buyer	9.4	87.6	3

* significant

✘ for Greece there are no totals or Chi-square analyses as no comparisons could be made between buyers and non-buyers

						%		
	country	chi-square	df	sig.		yes	no	don't know
Q5	Germany				GM-free buyer	14.3	60.1	25.6
		3.034	3	0.219	non-buyer	18	56.2	25.8
					Total	15.9	58.4	25.7
	Sweden				GM-free buyer	2.7	54.1	43.2
		2.943	2	0.23	non-buyer	10.2	43.4	46.4
					Total	9.6	44.2	46.2
	Greece				GM-free buyer	-	-	-
					non-buyer	8.4	89.4	2.2
Q6	Germany				GM-free buyer	58.2	25.7	16.1
		9.243	2	0.010*	non-buyer	49.3	29.5	21.2
					Total	54.2	27.4	18.4
	Sweden				GM-free buyer	64.9	2.7	32.4
		2.87	2	0.238	non-buyer	53.2	9.6	37.3
					Total	54	9.1	36.9
	Greece				GM-free buyer	-	-	-
					non-buyer	88.2	10	1.8
Q7	Germany				GM-free buyer	10.5	69.9	19.6
		0.019	2	0.991	non-buyer	10.3	70.2	19.5
					Total	10.4	70	19.6
	Sweden				GM-free buyer	8.1	48.6	43.2
		0.019	2	0.99	non-buyer	8	47.6	44.4
					Total	8	47.7	44.3
	Greece				GM-free buyer	-	-	-
					non-buyer	14.2	82.4	3.4
Q8	Germany				GM-free buyer	29.5	46.8	23.7
		2.326	2	0.313	non-buyer	32	42.2	25.9
					Total	30.6	44.7	24.7
	Sweden				GM-free buyer	18.9	37.8	43.2
		0.594	2	0.743	non-buyer	23.7	32.9	43.4
					Total	23.4	33.2	43.4
	Greece				GM-free buyer	-	-	-
					non-buyer	27.2	70.4	2.4

* Significant

						%		
	country	chi-square	df	sig.		yes	no	don't know
Q9	Germany				GM-free buyer	18.4	50.9	30.7
		6.101	2	0.047*	non-buyer	20	43.6	36.4
					total	19.1	47.6	33.2
	Sweden				GM-free buyer	27	32.4	40.5
		2.672	2	0.263	non-buyer	16.5	36.1	47.7
					total	17.3	35.8	46.9
	Greece				GM-free buyer	-	-	-
					non-buyer	28.8	67.6	3.6

						%					
	country	chi-square	df	sig.		1 very bad	2 bad	3 not bad, not good	4 good	5 very good	99 don't know
Q10	Germany				GM-free buyer	58.7	15.4	1.3	0	0	24.6
		15.08	3	0.002*	non-buyer	48.9	16.7	3.7	0	0	30.8
					Total	54.3	16	2.4	0	0	27.4
	Sweden				GM-free buyer	75.7	10.8	0	0	0	13.5
		1.546	3	0.672	non-buyer	70.3	14.1	3	0	0	12.5
					Total	70.7	13.9	2.8	0	0	12.6
	Greece				GM-free buyer	-	-	-	-	-	-
					non-buyer	56.6	29.4	3.8	0	3.2	7

* Significant

Chapter 7

THE CZECH REPUBLIC

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Background and History

The Czech Republic was the first country in central and eastern Europe to adopt legislation on GMOs harmonized with EU directives; GMO field trials started very soon after. As early as 1998, Association BIOTRIN launched the first public debate on the science of genetic modification.

In the Czech Republic, Act No. 153/2000 Coll. on the *Use of Genetically Modified Organisms and Products* together with amendments of some related acts came into force on January 1st, 2001.

Act No. 78/2004 Coll., on the *Use of Genetically Modified Organisms and Genetic Products* came into effect on February 25th, 2004, thereby repealing Act No. 153/2000.

After the accession of the Czech Republic to the EU, an amendment to Act 78/2004 was adopted to bring Czech legislation into with EC regulations 1830/2003 (traceability and labelling) and 1946/2003 (transboundary movements); it became effective on September 13th, 2005 (Act No. 346/2005 Coll.):

- (a) the competent authority under the Act is the Ministry of the Environment with Co-operating Authorities the Ministries of Health (MoH) and of Agriculture (MoA);
- (b) the Czech Commission for the Use of GMOs and Products serves as an expert advisory body to the Ministry of the Environment;
- (c) the competent authority on state supervision is the Czech Environmental Inspectorate.

An amendment to Act No. 110/1997 Coll. on *Foods and Tobacco Products* concerning the approval and labelling of GM food, which included the provisions of the EU Regulation on Novel Foods and Novel Food Ingredients, came into force in January 2001; the obligation to label such products was effective as from January 2002.

EU Regulation 1829/2003 on genetically modified food and feed as well as other EU regulations is directly applicable so that Act No. 110/1997 Coll. on Foods and Tobacco Products was amended accordingly. The competent Authority is the Ministry of Agriculture.

The Present

Political Landscape

In the period following June 2006, the Czech Republic had no stable government; in those circumstances, matters such as GMO acceptance were not and are not yet major concerns of government policy.

Three political parties form the Government:

- Citizens Democratic Party (CDP) is very positive towards GMOs;
- The second most influential is the Social Democratic Party (SDP), always supportive on GMO issues and voted with CDP against the participation of NGOs in the decisions on GMOs.
- The Green Party, a small group forming part of the coalition, are represented for the first time in the Czech Parliament. In the recent election campaign, issues involving GMOs were not raised by them. The party is for the moment seemingly little interested in GMOs as they perceive other, more pressing matters demanding their attention. There is an influence of Czech “green” NGOs but their present priorities, too, are directed elsewhere. As a consequence, there are ongoing disputes over nuclear power plants with other issues, such as GMOs, sidelined and not in play. Nor have most of the Czech “green” NGOs taken up the GMO issue so that the opposition to GMOs is almost entirely in the hands of Greenpeace.

In general, public concern about food safety is focused on BSE, bird flu and contamination of certain food products by *Listeria*. In general, Czech consumers did not and do not boycott GM foods.

A specific issue is represented by organic (“ecological”) farmers who have stated plainly that their slogan “zero content of GMO” is a marketing tool; they do not emphasise any supposed health risk to consumers. Ecological farmers nevertheless oppose the EU 0.9% limit, arguing they will lose “the confidence of their consumers.”

The major player on GMO issues is the Ministry of Environment (<http://www.env.cz>).

Hitherto, the following 11 GM varieties of crops have been approved for deliberate release (field trials or commercial cultivation) in the Czech Republic:

potatoes:	6 strains (two with altered sugar or starch contents, increased content of amylopectin or amylase enzyme, improved resistance against mycosis)
maize:	3 (one hybrid, two new lines)
plum trees:	1
flax:	1

The Agrarian Chamber of the Czech Republic (AK CR) was established in 1992 as an association of agricultural, forestry and the food industry interests and thus an influential voice on agricultural matters. The president of the Agrarian Chamber has made several media statements about GMOs. He supported the introduction of Bt corn as an opportunity for

farmers, saying “There are no indications that they (GMOs) would be harmful. The struggle against GM-food seems to me similar to the struggle against nuclear power plants. The growing of GMO-crops definitely improves the quality of harvest, e.g. decreases the contamination by mycotoxins. We must also keep in mind that it improves quality of the environment, particularly reduces the application of pesticides and saves fuel.” He is also critical of the conservative EU approach.

AGRObase, the official magazine of Agrarian Chamber, published items very positive to GM-crops and explains the nature of genetic modification. As a result of this positive political landscape the area of GM-crop cultivation as well as the number of farmers involved both increase every year.

Bt corn plantings in the Czech Republic

Year	Area	Number of farmers
2005	270 ha	52
2006	1,250 ha	85
2007	ca 5,000 ha	131

The *Federation of the Food and Drink Industries* of the Czech Republic (<http://www.foodnet.cz>) is active with regard to the labelling of GM-foods; BIOTRIN was invited by the Federation to help support GMOs in the Czech food industry and trade by organising the section “Food and Consumer” in the framework of EU programme *Platform Food for Life*.

Two NGOs are primarily involved with informing the Czech Republic about GMOs and their presence and role in the Czech Republic:

Greenpeace is well known for its rejection of GM technology. Less insistent in the Czech Republic than they were some years ago, they mounted a protest in 2000 when the Ministry of Environment and BIOTRIN jointly organised an International Conference on Biotechnology for representatives of the central and eastern European countries. Greenpeace also protested against Bt-corn and damaged field trials. Representatives of the organisation publish and debate in the media from time to time but their impact on public opinion is not strong.

Association BIOTRIN is a civil, non-profit organization established by the academic community for the dissemination of information on modern biotechnology. Publications, articles, seminars, workshops or conferences and web page (<http://www.biotrin.cz>) are used to explain genetic engineering and all aspects of GMOs to public. The web page provides a monthly media monitor followed by journalists, and provides news on biotechnology, mainly on GMOs.

Survey of GM foods and sales

Interviewing retailers

At start of the survey, attempts were made to discuss the issues with retailers and to obtain

from them details of products on sale. Formal requests were made to the managements of the major retailing chains Ahold Czech Republic a.s., Tesco Praha s.r.o, Makro Cash & Carry ČR s.r.o and KAUFAND ČR v.o.s, in each case requesting a short interview and co-operation with the CONSUMERCHOICE project. No response were received from any of them nor did their internet pages yield any relevant information. Their stores offer no information on GMOs to consumers. In short, the issue does not appear to be important to them.

Products on sale

Our survey of products on sale was therefore confined to personal investigations of the GM-foods on the market and how they were labelled.

Store visits were made in 10 towns in 6 regions: in Prague, central, south and west Bohemia, and in north and south Moravia. Only the north and east of Bohemia were not investigated. Food stores for personal visits were chosen in 3 large cities, 3 middle sized towns and 4 small towns or villages (Fig. 1, Table 1).

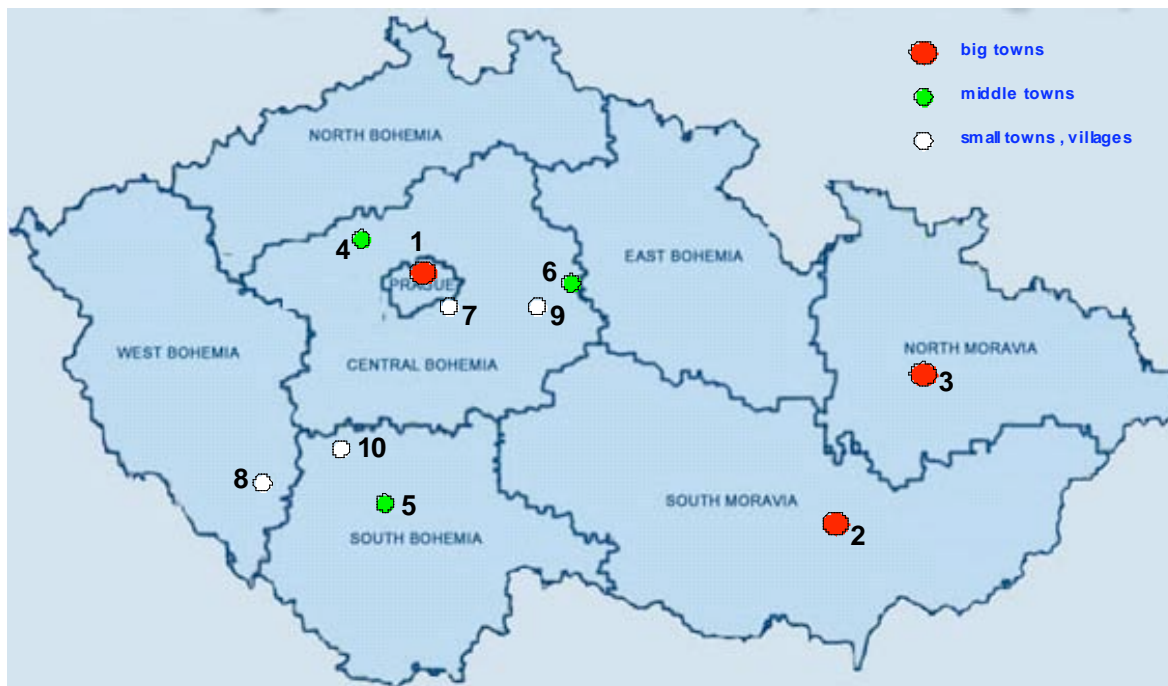


Fig. 1. Locations of store visits

Table 1. Towns selected for food shop surveys of GM-foods

no	category of town	amount of inhabitants/ region	type of market / shop	number investigated
1	large cities ●	1,180,000 / Central Bohemia, Prague	Supermarket Self-service Small shop	3 3 3
2	●	370,000 / Southern Moravia, Brno	Supermarket Self-service Small shop	3 3 3
3	●	100,300 / Northern Moravia, Olomouc	Supermarket Self-service Small shop	3 3 3
4	medium-sized towns ●	71,000 / Central Bohemia, Kladno	Supermarket Self-service Small shop	3 3 1
5	●	29,800 / Southern Bohemia, Písek	Supermarket Self-service Small shop	2 2 2
6	●	30,200 / Central Bohemia, Kolín	Supermarket Self-service Small shop	2 2 2
7	small towns ○	11,800 / Central Bohemia	Self-service Family shop	2 3
8	○	1,600 / Western Bohemia	Self-service Family shop	2 1
9	○	1,800 / Central Bohemia	Family shop	2
10	○	900 / Southern Bohemia	Family shop	1

Stores visited:**hypermarkets**

PLUS
TESCO
BILLA
COOP
PENNY

supermarkets

Kaufland
Hypernova
Albert
Delvita
Lidl

The following information was recorded for each product:

- product type (e.g. oil, milk, margarine, hardened fat, soya, etc.)
- product name, brand
- producer
- distributor
- location and details of label (main label, side label, type and size of letters)
- is shelf labelled? if yes: where and how?

- in what position is the product placed on the shelf?
- position of similar conventional products, their brands and other information (volume, etc.)
- percentage of GM-labelled product among similar ones non-GM?
- price of labelled product compared with analogous conventional products

In summary, we undertook 57 shop visits to hyper- and supermarkets as well as to corner shops. Data were collected twice during the project, once during the period July 2006 – March 2007 and again between October 2007 and February 2008. Analysis of the data sets showed that the size of the town, type of shop, placing of products on shelves or price of GM- compared with analogous non-GM-products were not significant so they were eliminated from the second round of sampling.

From July 2006 – March 2007 we found 19 brands of labelled GM-oil products (mainly produced by Czech manufacturers), 1 brand of GM-margarine (imported) and 1 brand of GM-popcorn (from the US). All were labelled “product contains raw material which was genetically modified”.

Examples of labelling

GM-products are labelled according to Czech laws but using a variety of wordings:

- *Vyroběný z geneticky modifikované sóji*
(produced from genetically modified soy)
- *Výrobek obsahuje geneticky modifikovanou sóju*
(product contains genetically modified soy)
- *SO + RE: SO – sojový olej vyrobený z geneticky modifikované sóji MON-04032-6*
(SO – soy oil produced from genetically modified soy MON-04032-6)

A total of 41 food products were labelled as GMO-free, usually with the rubric “Product does not contain genetically modified raw material “. Among such products were sunflower and rapeseed oils (Czech products), margarines, spelt, wheat, buckwheat, millet, soybean products (meat, meal, flakes, biscuits) and fish fingers. Note that the labelling of products as “non-GMO foods” is not restricted in the Czech Republic.

Manufacturers began labelling non-GM-foods, mainly oils and soya foods, during the last two years. A number of rubrics are employed:

- *Vyroběno ze surovin, které nebyly geneticky modifikovány*
(produced from raw material that was not genetically modified)
- *Vyroběno z genově neošetřených surovin*
(produced from gene non treated raw material)
- *Výrobek neobsahuje geneticky modifikované organismy*
(product does not contain genetically modified organisms)
- *Výrobek neobsahuje GMO*
(product does not contain GMO)
- *Ohne Gentechnik* (imports from Germany)

(GM-free)

- *Je vyrobeno jen z negeneticky modifikovaných kukuřičných semen*
(produced only from non-genetically modified maize seeds)
- GMO-Free (imports from various countries)
- *Použito geneticky nemodifikovaných surovin*
(uses genetically non-modified raw material)
- “GMO – Free” – *výrobce garantuje maximální obsah transgenní DNA do 1,0 %*
(“GMO-Free “ producer guarantee maximal content of transgenic DNA to 1,0 %)
- “GMO-Free” – *produkt ekologického zemědělství*
(“GMO – Free “ – product of ecological agriculture)

Sampling between October 2007 and February 2008 revealed 25 brands of labelled GM-oils, 1 margarine and 1 popcorn (the last two were the same as had been found earlier).

There had been a clear change of practice by the main Czech manufacturers of soya products. Both SETUZA (oil food products) and Pragosoja (the main soybean products manufacturer) had decided to highlighting their GM-free products. Thus, between October 2007 and February 2008 we found 75 brands of foods labelled as GM-free. Among them were various vegetable oils, margarines, corn products, soybean products, rice, buckwheat, wheat, oat, barley, spelt, red lentil, chickpea, raisins, apricots, banana (dry imported foods).

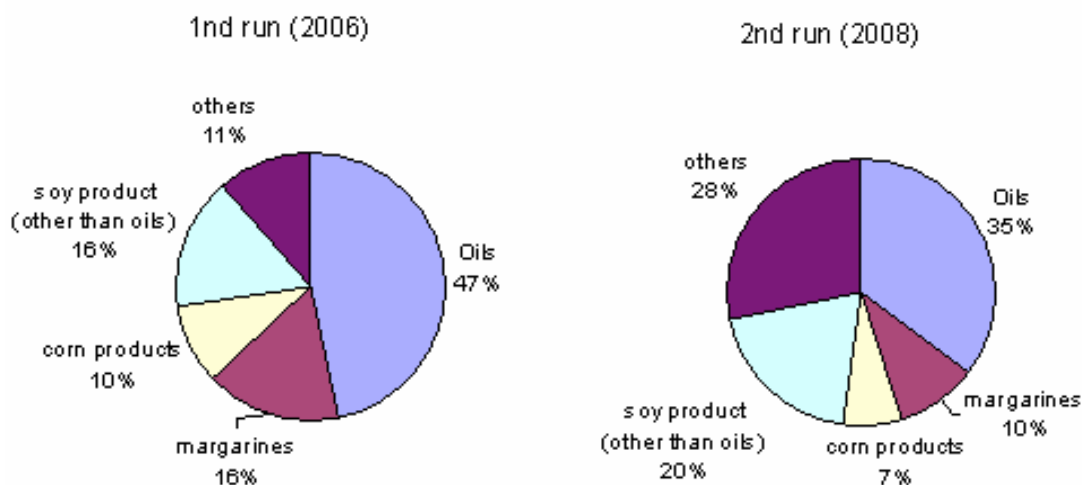


Fig 2. Labelled GM-foods found in the earlier and later sampling periods

The numbers both of GM- and non-GM-labelled food items increased during the project period, the latter by more than the former.

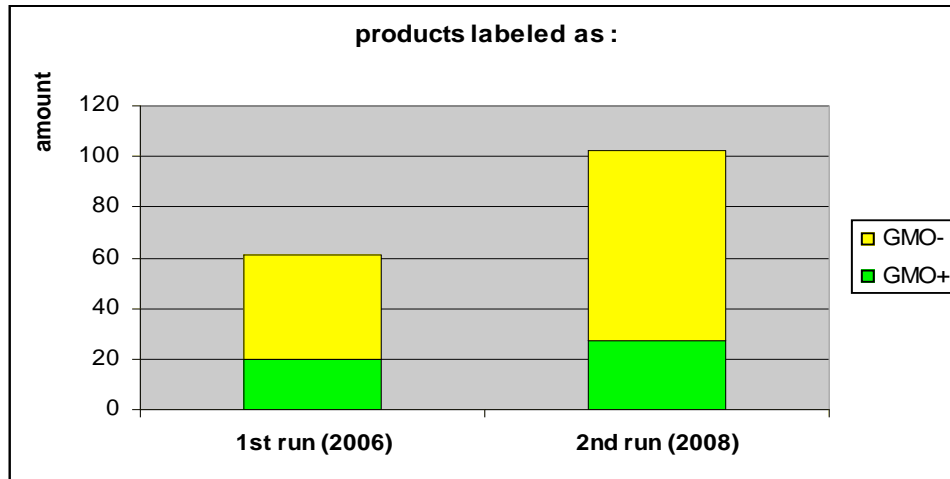


Fig. 3. Number of labelled products in two project periods of investigation

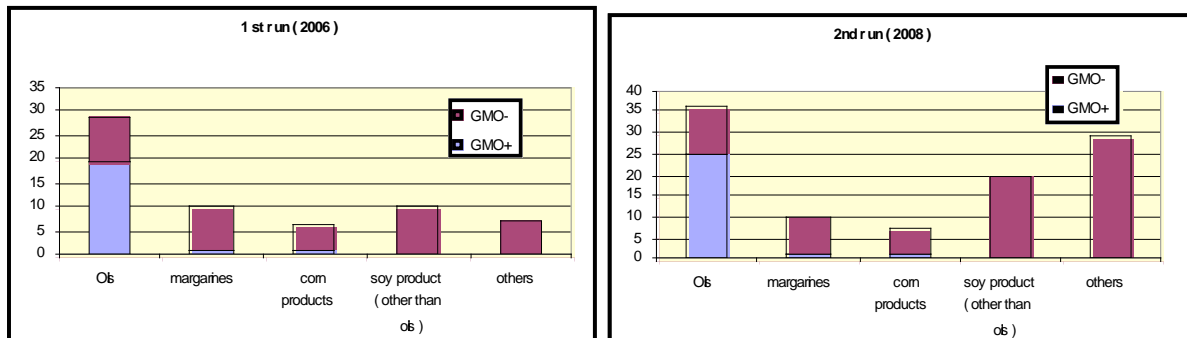


Fig 4. Comparison of numbers of GM- and non-GM-labelled products during the two sampling periods

Conclusions

Retailers were not willing to co-operate with the CONSUMERCHOICE project but a few discussions with employees in shops showed that they are not aware either of genetic engineering or of the legal requirement for GM-labelling. Retailers appear not to have any general policies against GM-foods and carry no statements on their websites about the matter. Most retailers import goods (mainly soya oil) from their headquarter countries; these are appropriately labelled as containing GMO-ingredients or being derived from GMO-sources. Some chains sell GM-foods (again mainly oils) produced by a Czech manufacturer under their own brand name.

Particular chain stores all contained the same brands: thus Tesco stores in the towns Písek and Kladno, and Albert shops in all the towns visited had practically same GM- and non-GM-foods on sale in all of them. Any differences were very minor.

SETUZA, a Czech manufacturer changed their labelling strategy of during the project. GM-food labels earlier printed in large letters were replaced by ones with smaller fonts. Some foods previously unlabelled acquired a notice of their being “non-GM” or “free from GM ingredients” and the number of non-GMO-items (mainly soy products other than oils)

increased significantly. There was little change during the survey in the number of oil brands offered.

A summary of all the labelled GM- and non-GM-foods is shown in Appendix 1 (page 7-13).

Media, opinion polls and politics

In identifying relevant items the key word "GMO" was used: only items referring to GM-foods, GM-crops, GM-feeds and animals fed GMO fodder were included in the analysis. Many items discussing co-existence and biofuels were excluded. Each month 75 media titles/outlets were monitored, comprising:

- 12 national newspapers incl. press agency
- 15 regional newspapers
- 16 magazines
- 2 TV channels
- 5 radio stations
- 23 internet news
- 2 tabloid newspapers

Media items were classified as follows:

- total number of items = 33
- average number of articles per month = 1.65
- news reports = 28 (85% of all items)
- comments and debate items = 4 (12% of all items)
- other items = 1 (3% of all items)

Attitudes of media items to GM-technology:

- favourable = 9 (27.3%)
- unfavourable = 11 (33.3%)
- neutral = 13 (39.4%)

A detailed listing of media items is provided in Appendix 2 (page 7-17) .

Comment articles and debates amounted to 33 items published in the press, on the internet or broadcast on TV or radio: items favourable to GM technology represented 67% of the total, those unfavourable 33%.

Media interest in GM issues waxed and waned as the following graph shows:

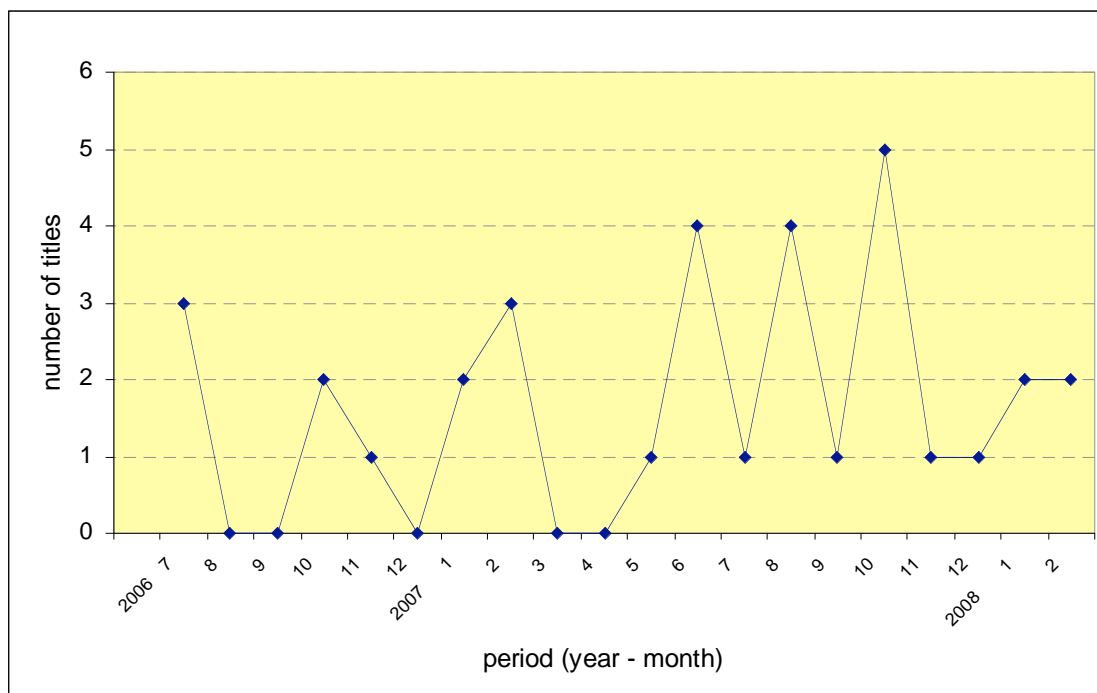


Fig. 5. Number of titles per month dealing with GMOs (July 2006 – February 2008)

The following themes were discussed in the media:

- present situation;
- certain GMO phobia of Europeans;
- labelling of GMO containing foods (requirement for labelling, how to label);
- analysis and control of potential risk;
- quality assurance – certification.

A few articles were clearly recognised as resulting from some specific event:

- a conference of biotechnology
- the detection of higher content of GM ingredients in non labelled sausages
- Anheuser Bush’s problem with GM rice as raw material for production of beer.

Articles dealing with GM-crops – and consequently with GM-foods – tended to be either negative or doubtful. They focused mostly on problems of GMO versus BIO foods, or on conventional versus organic agriculture.

In general, articles and reports dealing seriously with evidence and with issues were very rare. Most dealt with anti-GM activist activities such as press releases, letters to the Ministry of the Environment and a gathering near the field where TouchDown maize was being tested. Several discussions on TV and radio were devoted to Bt-maize when commercial planting was first introduced in the country. The discussions were well designed and organised; if an activist objector was present a scientist was always invited to offer an explanation.

Other reports mentioning GMOs come from organic farmers’ statements that their products “are free from GMO”. Several organic farmers said that an “absence of GMO is necessary to retain the confidence of consumers”.

The Czech media reflect the fact that the population in general are little concerned about GMOs and hence it is not a very appealing subject for journalists.

We therefore conclude that in the Czech Republic the GMO question is marginal for the public at large.

Consumer research

Although not part of the work programme of CONSUMERCHOICE, Association BIOTRIN has permission to use consumer research data gathered by Agriculture University in Prague.

One of the aspects dealt with consumer's opinions on GMOs and GM foods. Researchers addressed 180 consumers of whom 116 responded (43% men, 57% women):

- a) To the question "What is your attitude towards GMO?", 30% of consumers were positive, 27% negative, 43% were neutral. There was no statistically significant dependence on age or education. Men were more positive than women (49% versus 13%)
- b) Asked about trust in institutions/organizations and products, consumers placed most trusted in the Czech Agricultural and Food Inspection Authority and least in Greenpeace.
- c) With respect to products, consumers expressed most confidence in traditional Czech food products and to Bio-products. They rejected chemically treated products.
- d) Price differentials were investigated as follows: Two food products (a plant oil and potatoes) of three different origins – organic, conventional and biotech. – were offered to respondents through photographs which included labels and prices. Biotech products were made cost-advantageous compared with the other products (the highest price differentials were in the case of plant oil). Under these test conditions, 26% of consumers chose the plant oil derived from GM soybeans compared with 65% who chose conventional products and 9% organic. With potatoes, the choices were 19% for GM, 58% for conventional and 19% for organic.
- e) A further question probed information availability: 22% of the respondents had "never heard" about GMOs while 80% had heard something but thought there was not enough information available. The perception of available public information did not depend on age or education; 45% of respondents obtained their information from the media, 26% from school or work and 29% only from other people.
- f) 36% of the consumers questioned were afraid of GMOs, 64% were not. A statistically significant difference was found between men and women: 48% of women but only 23% of men expressed fear of GMOs. The reasons for fear were mainly: unexpected impacts on the human body, feelings that GMOs are unnatural or unexamined and that consumers did not have enough information.

References

1. Drábková. Alena (2008). *GM crops and products after their introduction in CR as reflected by producers and consumers*. MS Thesis, Department of Agroecology and Biometeorology, Czech University of Agriculture, Prague.

2. Čěřovská, Marie (2006). *Technology and socio-economic impacts of planting GM crop and risk assessment in the conditions of CR*. PhD Thesis, Department of Agroecology and Biometeorology, Czech University of Agriculture, Prague.

APPENDIX 1: LABELLED FOODS ON SALE

Table 2. Labelled foods on sale July 2006 - March 2007

type of good	no	name	producer	labelled as	found in *			
					sm	ss	fs	
Cooking Oils	1	Lukana - vegetable oil	1 - CZ	GMO+	X	X Y	X	
	2	Lukana - table oil	1 - CZ		X Y	X Y S	X Y	
	3	Lukana - fritting oil	1 - CZ		X Y	X		
	4	Ceresol	1 - CZ		X Y	X Y S	X Y S	
	5	Ceresol - fritting oil	1 - CZ			Y		
	6	Vegetol - vegetable oil	1 - CZ		X Y	X Y S		
	7	Vegetol Gold	1 - CZ			Y S	Y	
	8	Vitae d'Oro – rape oil	1 - CZ		Y			
	9	Lando oil	2 - Germany		X Y	X	X	
	10	Oilio	3 - Belgium		X Y			
	11	Soy oil	4 - CZ				X	
	12	Carotino	5 - Malaysia		X	X		
	13	Soy oil – Forte – aOP BVBA	6 - Belgium			Y S	X Y S	
	14	Vegetable oil - Karolina	7 – ?		X Y			
	15	AVE	1 - CZ				X S	
	16	oil - Ahold	10 - ?			X		
	17	Bohemia – table oil	13 - CZ		Y			
	18	COOP classic	1 - CZ			Y S		
	19	FROL – table oil	14 - CZ			S		
	20	Lukana - Sunflower oil	1 - CZ		GMO -	X Y	X Y S	X S
	21	Lukana - fritting rape oil	1 - CZ			Y	X S	
	22	Lukana Gold	1 - CZ			Y		
	23	Ceresol - rape table oil	1 - CZ			X	X	
	24	Vegetol - Sunflower oil	1 - CZ			X Y	X S	X
	25	Brolio – table oil	8 - Germany			X Y	X Y S	X Y S
	26	Brolio – fritting oil	8 - Germany			Y		
	27	Giglio oro – maize oil	9 - Italy			X Y		
	28	Rapso - rape table oil	11 - Austria			X		
	29	Sunflower – for LIDL	12 - Germany				Y	
Vegetable Solid Fats (margarines)	1	Bianka fit	1 - CZ	GMO -	X	X		
	2	Alfa vital	1 - CZ		X	X		
	3	Alfa optima	1 - CZ		X	X		
	4	Diana light	1 - CZ		X			
	5	Ceres soft	1 - CZ		X	X	X	
	6	Ceres soft – for frying	1 - CZ		X	X		
	7	Ceresol soft	1 - CZ		X			
	8	Omega –for frying	1 - CZ		X	X	X	
	9	Lukana – for frying	1 - CZ		X	X	X	
	10	Rela – Plus Discount	15 - ?		GMO+	X		
Corn products	1	Popcorn – Orville Redenbacker's	16 - US	GMO+	X	X		
	2	Popcorn – Hopi Popi	17 - US	GMO -	X	X Y	Y S	
	3	Popcorn – Jolly time	18 - US			X		
	4	Popcorn - special	20 - CZ					
	5	Pukance – ProBio (spelt, wheat, buckwheat,	21 - CZ			X		
	6	Biofoods – Pro.Bio –(sunflower, buckwheat, millet, spelt)	21 - CZ		X Y	X Y	X Y	

Soya products	1	soya meal - Paleta	22 - CZ	GMO -	X	X	
	2	soya meat – cubes, strips, granules	23 - CZ			X	X
	3	soya meat – cubes,	24 - CZ			X	
	4	soya meat – soja cereal	29 - CZ			X	
	5	soya meat – Big steak	25 - CZ			X	
	6	soya drink (instant) – Zajíc –	26 - CZ		X	X	X
	7	soya milk	27 - CZ			X	X
	8	soya milk – soya mini	28 - Slovakia			X	X
	9	soya granules	30 - CZ				X
	10	Soya Coffee creamer	27 - CZ				X
Others	1	maize drink	27 - CZ	GMO -	X		X
	2	corn flakes Bio	31 - CZ			X	X
	3	corn meal	32 - CZ		X		
	4	chicken salami with soya protein	33 - CZ				S
	5	sausages with soya protein	34 - CZ			Y	
	6	biscuits	35 - CZ				S
	7	fish fingers – pre fried – with soya in cover	36 - Estonia			Y	

Note : in column „ found in“ symbols mean : **sm** : supermarkets, **ss** : selfservice stores, **fs** : family shops,
X : big size towns (1 – 3), **Y** : middle size towns (4 – 6), **S** : small size towns and villages,
? : producer was not identified

Table 3. Labelled foods on sale October 2007 - February 2008

type of good	no	name	producer	labeled as	found in sm category in town *
cooking oils	1	Lukana - vegetable oil	1 - CZ	GMO+	
	2	Lukana - table oil	1 - CZ		2 - 3 - 4
	3	Lukana - fritting oil	1 - CZ		2
	4	Ceresol	1 - CZ		1 - 2 - 3 - - 5
	5	Ceresol - fritting oil	1 - CZ		
	6	Vegetol - vegetable oil	1 - CZ		5
	7	Vegetol Gold	1 - CZ		1 - 2 - - 4
	8	Vitae d'Oro - rape oil	1 - CZ		
	9	Lando oil	2 - Germany		2 - - 4
	10	Oilio	3 - Belgium		
	11	Soy oil	4 - CZ		
	12	Carotino	5 - Malaysia		
	13	Soy oil - Forte - aOP BVBA	6 - Belgium		2 - 3
	14	Vegetable oil - Karolina	7 - ?		
	15	AVE	1 - CZ		
	16	oil - Ahold	10 - ?		
	17	Bohemia - table oil	13 - CZ		
	18	COOP classic	1 - CZ		
	19	FROL - table oil	14 - CZ		
	20	Lukana - Sunflower oil	1 - CZ		GMO -
	21	Lukana - fritting rape oil	1 - CZ	1 - 2 - 3 - - 5	
	22	Lukana Gold	1 - CZ		
	23	Ceresol - rape table oil	1 - CZ		
	24	Vegetol - Sunflower oil	1 - CZ	1	
	25	Brolio - table oil	8 - Germany	2 - 3 5	
	26	Brolio - fritting oil	8 - Germany		
	27	Giglio oro - maize oil	9 - Italy	2 - 3	
	28	Rapso - rape table oil	11 - Austria	1	
	29	Sunflower - for LIDL	12 - Germany		
	30	COROLI - soyabean oil	37 - Belgium	GMO +	1
	31	COROLI - Soya oil	38 - Holland		1
	32	EuroShopper - vegetable oil	1 - CZ		1
	33	Bohemia - table oil	50 - CZ		2 - 3 5
	34	Vegetol - sun flower oil GOLD	1 - CZ		3 5
	35	Vitae d'oro - oil for Kaufland	1 - CZ		3 - 4
	36	Lukana - table oil for Penny	1 - CZ	GMO -	
vegetable solid fats: margarines	1	Bianka fit	1 - CZ	GMO -	
	2	Alfa vital	1 - CZ		
	3	Alfa optima	1 - CZ		
	4	Diana light	1 - CZ		
	5	Ceres soft	1 - CZ		
	6	Ceres soft - for frying	1 - CZ		
	7	Ceresol soft	1 - CZ		1
	8	Omega -for frying	1 - CZ		
	9	Lukana - for frying	1 - CZ		
	10	Rela - Plus Discount	15 - ?	GMO+	
Maize products	1	Popcorn - Orville Redenbacher's	16 - US	GMO+	
	2	Popcorn - Hopi Popi	17 - US	GMO -	
	3	Popcorn - Jolly time	18 - US		
	4	Popcorn - special	20 - CZ		
	5	Pukance - ProBio (spelt, wheat, buckwheat,	21 - CZ		
	6	Biofoods - Pro.Bio -(sunflower, buckwheat, millet, spelt)	21 - CZ		

	7	Doma Popcorn	23 - CZ		2 - 3
Soya products other than oils	1	soya meal - Paleta	22 - CZ	GMO -	
	2	soya meat – cubes, strips, granules	23 - CZ		1 – 2 – 3 - 4
	3	soya meat – cubes,	24 - CZ		1
	4	soya meat – soja cereal	29 - CZ		
	5	soya meat – Big steak	25 - CZ		
	6	soya drink (instant) – Zajíc –	26 - CZ		1 – 2 – 3 – 4 - 5
	7	soya milk	27 - CZ		
	8	soya milk – soya mini	28 - Slovakia		
	9	soya granules	30 - CZ		
	10	Soya Coffee creamer	27 - CZ		
	11	soya meal – Blansko – Pro Bio	39 - CZ	GMO -	1
	12	soya meat – strips,	23 - CZ		1 - 3
	13	soya granules	40 - CZ		1
	14	soya granules with ham	23 - CZ		1
	15	soya noodles – china type	23 - CZ		1
	16	soya slices	23 - CZ		1 - 3
	17	soya – cubes	41 - Holland		1
	18	soya – cubes special for goulash	42 - CZ		1
	19	soya - cubes	42 - CZ		1
	20	Soya drink : classic, capucino, Waldbeere	51 - Germany		2 – 3 – 4 - 5
Others	1	corn drink	27 - CZ	GMO -	
	2	corn flakes Bio	31 - CZ		
	3	corn meal	32 - CZ		
	4	chicken salami with soya protein	33 - CZ		
	5	sausages with soya protein	34 - CZ		
	6	biscuits	35 - CZ		
	7	fish fingers – pre fried – with soya in cover	36 - Estonia		
	8	Rice long grain	43 - Italy	GMO -	1
	9	Rice pied	43 - Italy		1
	10	Rice Basmati natural	43 - Italy		1
	11	Buckwheat - blanched - broken	44 - China		1
	12	Buckwheat - blanched - groats	44 - China		1
	13	Buckwheat cereals	44 - China		1
	14	Buckwheat grain meal	44 - China		1
	15	Oat flakes	45 - Germany		1
	16	Wheat flour	46 - Slovakia		1
	17	Wheat pastes - mix	47 – CZ		1
	18	Wheat pastes - special	47 - CZ		1
	19	Wheat pastes with spirullina	47 - CZ		1
	20	Barley flakes	48 - Turkey		1
	21	Millet	44 - China		1
	22	Spelt biscuit	47 – CZ		1
	23	Spelt flakes	47 – CZ		1
	24	Red lentil - blanched	48 - Turkey		1
	25	Pumpkin seeds - blanched	44 - China		1
	26	Chickpea	48 - Turkey		1
	27	Raisins	48 - Turkey		1
	28	Apricots dried	48 - Turkey		1
	29	Banana slices	49 - Philippines		1

Note : Newly registered products are in each category under bold line

In column “producer” is also country of origin (mainly in category “Others”)

In column “found in” numbers are related to town number in map, **sm** : supermarkets.

APPENDIX 2: MEDIA ITEMS RECORDED

Table 4. Media analysis in 2006

no	date of publication	media	source	headline	issue	opinion driven	issue driven	national regional
1	14.7.2006	Publication	PRÁVO	Science and Technology	GM foods	X		national
2	18.7.2006	Internet	blisty.cz	Nelze odlišit potraviny ze zvířat krmených GM plodinami	GM crops,meat	X		national
3	18.7.2006	Internet	blisty.cz	Jak je to opravdu s GM potravinami?	GM foods	X		national
4	4.10.2006	Publication	Moderní obchod	Certifikace jako potvrzení vlastních kvalit	GM foods	X		national
5	7.10.2006	Publication	Zlínský deník	Máte strach z GM plodin?	GM crops	X		regional
6	9.11.2006	Publication	Květy	Geny na talíři	GM foods	X		national

Table 5. Media analysis in 2007

no.	date of publication	media	source	headline	issue	opinion driven	issue driven	national regional
1	11.1.2007	Publication	SONDY	GMO: hrozba nebo záchrana lidstva?	GMO	X		national
2	22.1.2007	Publication	EURO	Nerovné soužití	GMO	X		national
3	5.2.2007	Publication	Zprávy ČTK	GP: Živočišné produkty s GMO by se měly označovat	GMO	X		national
4	5.2.2007	Publication	Rytmus života	Klonovaný jídelníček	GM animals	X		national
5	8.2.2007	Publication	SONDY	Reklamní finty klamou zákazníky	GM labelling	X		national
6	7.5.2007	Publication	PROFIT	Česko bude nízkouhlíkovou zemí	GM potato	X	X	National
7	11.6.2007	Publication	REGAL-GP	GM potraviny pod kontrolou	GM food-Bio	X		National
8	16.6.2007	Publication	Mf DNES	Evropa je bohatá, i tak potřebuje "lepší" potraviny	GM food-Bio	X		National
9	19.6.2007	Radio	Greenpeace	Dialog	GMO	X		National
10	25.6.2007	Publication	Zemědělec	GM plodiny žádané i zatracované	GM crops	X		National
11	27.7.2007	TV ČT1	Dobré ráno	Co jsou geneticky upravené potraviny?	GM foods	X		Regional
12	27.8.2007	Publication	NGO - GP	Kdo potřebuje rajčata s prodlouženou trvanlivostí?	GM tomato	X		National
13	27.8.2007	Publication	Literární nov	GMO, naše průmyslová budoucnost	GM for industry	X		National
14	26.8.2007	Internet	aktualne.cz	Ukončí Evropané svou nechuť ke genet. Inženýrství	GMO, GM food	X		National
15	24.8.2007	Publication	TREND-GP	BIO vs. GMO	GMO, Bio-food	X		National
16	12.9.2007	TV ČT1	Dobré ráno	V Praze probíhá konference o biotechnologiích	GMO, biofuel	X	X	National
17	4.10.2007	Publication	SONDY	O škodlivosti GM potravin aneb za vším hledej politiku	GM foods	X		National
18	10.10.2007	Internet	blisty.cz	Bush vaří pivo z GM rýže	GM rice-beer	X	X	National
19	11.10.2007	Publication	SONDY	Je spotřebitel skutečně pokusným králíkem bioprůmyslu?	GMO	X		National
20	23.10.2007	Publication	ČTK zprávy	GP: Některé testované uzeniny na trhu obsahovaly GMSóju	GM foods	X	X	National
21	30.10.2007	RadioČRo1	Radiožurnál	Geneticky modifikované organismy	GMO	X		National
22	19.11.2007	Publication	Zemědělec	V Senátu se hovořilo o transgenech	GM crops	X	X	National
23	27.12.2007	Internet	super.cz	Opravdu víte, co jíte?	GMO, GM food	X		National

Table 6. Media analysis in 2008

no.	date of publication	media	source	headline	issue	opinion driven	issue driven	national regional
1	17.1.2008	Internet	iHNed.cz	EU rozhoduje o potravinách z klónů	GM food, clones	X	X	National
2	25.1.2008	Publication	Svět	Válka o kukuřičné pole	GM corn	X		National
3	22.2.2008	Publication	IBZ	Geneticky modernizovaný obchod	GMO, trade	X	X	National
4	25.2.2008	Publication	Weekly	GM brambory jsou stále ve hře	GM potato		X	National

Chapter 8

ESTONIA

Raivo Vokk
Katrin Argus

Introduction

In the closing years of the 20th century, Europe witnessed a number of disturbing food-related crises and issues, some with serious outcomes. They included cases of deliberate and illicit adulteration, contamination with noxious chemicals from industrial effluents and the involvement of animal diseases, including bacterial infections and bovine spongiform encephalopathy. In some countries these crises generated growing scepticism about food safety information deriving from governmental and other official authorities. These food-related problems were the precursors of the great GM-food debate which remains largely unresolved to this day.

Political landscape and the dissemination of knowledge through websites

In Estonia there are various websites providing consumers and citizens with information about GM-foods. Some are governmental sites such as the main site of the Riigikogu (Parliament) <http://www.riigikogu.ee/> where the verbatim proceedings of meetings are reported), but most are from NGOs.

Factions can be formed by and must consist of not less than five members of the Riigikogu elected from the same list of candidates. Members of one list of candidates can form only one faction. Factions are groups through which much of the work of the Riigikogu proceeds: political decisions are agreed upon and those decisions form the basis for expressing one's opinion in a committee, at the sittings of the plenary assembly of the parliament or in public. A faction is a place for making political agreements. This does not mean that there can never be different opinions within a faction. Factions, like members of the Riigikogu and committees, have the right to initiate draft legislation; this ensures the opposition factions an opportunity to prepare and defend their own draft legislation in the Riigikogu.

The main factions are:

Estonian Centre Party faction - 29 members
Estonian Green Party Faction - 6 members
Estonian People's Union faction - 6 members
Estonian Reform Party faction - 31 members
Faction of the Social Democratic Party - 10 members
Pro Patria and Res Publica Union faction - 19 members

Two parties Estonian Green Party (<http://roheline.erakond.ee/>) and Estonian People's Union (<http://www.erl.ee>) explicitly mention GMO issues in their programmes while the other

parties tend to use GMO issues as part of the main policy programmes.

Three GMO related conferences have been supported financially by the Estonian Government – in 2006, 2007 and 2008.

Many NGOs have been involved with informational and educational issues surrounding GMOs; their websites are directed mostly to the general public and consumers.

The Network of Estonian Non-profit Organizations (NENO) (<http://www.ngo.ee/>) is a national association of NGOs dedicated to the development of civic initiatives and the Estonian civil society, in which NENO is concerned with the links between public benefit nonprofits and society.

Traders and retailers belong to the non-profit voluntary association Eesti Kaupmeeste Liit (Estonian Traders' Association - <http://www.kaupmeesteliit.ee/>). It was established in April 1996 to bring together retailers with common interests in solving a variety of problems and to represent them in various institutions in Estonia and abroad. The association has 50 members - retail and wholesale enterprises.

The Estonian Fund for Nature (Eestimaa Looduse Fond [ELF] <http://www.elfond.ee/>) has a special link for about GMOs their readers (<http://eko.org.ee/gmo/>) while the Estonian Green Movement (<http://www.roheline.ee/>) publishes up-to-date news on related topics.

ETK (<http://www.etk.ee/>) is a founder member of the ECR-Estonia association and a pioneer for the development of co-operation between commerce and industry; they provide educational materials about GMOs.

GMO-free Estonia (<http://www.eko.org.ee/gmo/>), founded in March 2005, now has 1,074 individual supporters and 285 landowners supporting their campaign for Estonia free from GMOs.

There is a website for people interested in food and cuisine including GMOs (www.kokaraamat.ee) and another for teachers and pupils which also carries material about the subject (www.koolielu.ee). Information on GM-seeds is available at <http://www.soasepa.ee/>, and on (GM) soya products at <http://www.soja.ee/> while the site at <http://www.dermapteek.com> discusses different medicines, including drugs made by transgenic technologies.

In conclusion: we have found more than 50 websites in Estonian carrying information on GMOs, mostly neutral or positive in tone; some of them also have an English summary.

Food legislation issues concerning the GM-food

Food legislation in Estonia has to take into account the growing demand for transparency and traceability as required by EU regulations on GMO food and feed labelling, and traceability (EC1829/2003 and EC1830/2003) which came into force on April 18th, 2004. These regulations still lack specific operational interpretations valid throughout the EU.

In Estonia, the Ministry of Agriculture (<http://www.agri.ee/>) is responsible for issuing permits

for handling and marketing novel food, including genetically modified food.

The Advisory Committee of Novel Foods at the Ministry of Agriculture undertakes risk analyses of products received from, but not containing genetically modified organisms. The *Advisory Committee* submits to the Veterinary and Food Board applications for permits for the handling of novel foods and, based on information and documentation provided by the applicants, offers a view on the compliance of novel foods, proposals about their labelling and the issuing of permits when satisfied they have sufficient information.

The Commission for Gene Technology provides advice to government on matters of gene technology including the authorising the marketing of GM-products including novel foods.

Public attitudes towards GMO-food.

It is, of course, impossible to predict how consumers will respond to food labelled as containing GM-ingredients, hence the dilemma for retailers, manufacturers and farmers. Some retailers claim no philosophical objection to offering GM-products but are clearly worried about the effect on their sales, especially if they are the first locally to do so.

The exercise of both individual and collective consumer choice in the matter of GM-foods has consequential implications for crop breeders, for the farmers who grow the crops, for the industries that process and distribute them and for the retailers who ultimately sell to the consumers in their stores. It will also affect restaurateurs, schools, hospitals and residential institutions, as well as those who write about food or offer advice on nutritional matters, and will influence official policy-making.

Published opinion polls and preferences for students (a group of educated consumers)

To obtain an overview of consumer preferences, we analysed published data from different surveys performed by Estonian Institute of Economic Research (EKI). Consumer attitudes to GM- and organic food in 2006 were as follows:

Shopping preferences:

14% - no difference, GMO or GMO-free

1% - GM-food

34% - only GM-free food

51% - organic food

A more detailed survey was undertaken in 2001 and 2005, summarised below::

Is there enough information available about GM food (in % of answers)?

year	available	more information needed	no information	not interested
2001	6	41	49	4
2005	8	33	51	8

Common attitude towards GM-cultivation

year	should be prohibited	under serious inspection	equal to ordinary agriculture	should be promoted
2001	19	60	19	2
2005	45	42	9	4

Common attitude and knowledge of safety, quality and environmental safety of GMOs; purchasing preferences

year	definitely buying	possibly buying	definitely not buying	no difference
2001	5	43	26	26
2005	2	24	46	28

Is GM-food safe?

year	yes	no	don't know
2001	20	32	48
2005	5	47	48

Is GM-food of better quality?

year	yes	no	don't know
2001	24	30	46
2005	7	45	48

Would the use of GMOs improve the agriculture in Estonia?

year	yes	no	don't know
2001	39	18	43
2005	12	34	54

Are GMOs safe for the environment?

year	yes	no	don't know
2001	36	14	50
2005	40	11	49

Are GMOs dangerous for your health?

year	yes	no	don't know
2001	37	12	51
2005	49	10	41

Is there an ethical issue with GMO use?

year	yes	no	don't know
2001	53	13	34
2005	51	11	38

As part of the CONSUMERCHOICE project, a specific questionnaire was developed for a consumer survey and put to students from the Tallinn University of Technology from whom 124 completed questionnaires were returned. The questions and answers together with a summary of the survey is given below:

The next questions have been included into questionnaires:

1. According to law, does food with GM-ingredients have to be labelled?
Yes/No/Don't know
2. Before deciding to buy a particular item do you always read (or have you previously read) the detailed contents listing on the package?
Answers on a six point approval scale
3. I do/do not know how to tell when a product contains GM-ingredients
Answers on a six point approval scale
4. Compared with other foods, I regard those containing GM-ingredients as being safer/less safe/about the same.
5. I am strongly in favour/against the use of-GM ingredients in food
In favour/against/neutral
6. I am careful never to buy food labelled as containing GM-material.
7. I do buy/have bought food that I know or believe contains GM-ingredients.
8. I don't care if the food I buy contains GM-material.
9. I do/would buy food with GM-ingredients because/if, compared with other food, it is/were (a) healthier (b) cheaper (c) tastier (d) grown in a more environmental friendly. You may check more than one of these.
10. In general I believe that the use of gene technology in food production is: good/bad
Answers will be measured with a ten point valuation scale

Summary of responses:

1		2	3	4		5		6		7		8		9		10
yes	106	3.69	3.06	safer	15	in favour	13	yes	37	yes	72	yes	38	a	50	6.19
no don't know	3 15			less safe	46	against	32	no	87	no	52	no	86	b	58	
				same	63	neutral	79							c	40	

Media analysis – newspaper articles

During the period from May 6th, 2006 - April 24th, 2008 articles on GMO issues were published in the Estonian press as follows:

distribution	title	frequency	total no. of articles	positive towards GM	negative towards GM	neutral
national	Eesti Päevaleht	daily	7	1	4	2
	Postimees	daily	17	3	9	5
	SL Õhtuleht	daily	2		2	
	Eesti Ekspress	weekly	2		1	1
	Maaleht	weekly	3		2	1
	Äripäev	daily	6	1	2	3
	Sirp	weekly	1	1		
regional	Sakala	daily	2		2	
	Meie Maa	daily	5		2	3
	Nädaline	daily	1			1
	Põhjarannik	daily	2	2		
	Virumaa Teataja	daily	0			
	Pärnu Postimees	daily	1			1
	Koit	thrice a week	0			
	Lääne Elu	thrice a week	0			
	Valgamaalane	thrice a week	1			1
	Vooremaa	thrice a week	2			2
	Võrumaa Teataja	thrice a week	1		1	
	LõunaLeht	weekly	0			
	Summary			53	8	25

GM-foods on sale

As well as a cooperative (Consum), there are seven major food stores chains operating supermarkets and hypermarkets in Estonia :

1. A-Selver AS (<http://www.selver.ee>)
2. Comarket AS (<http://www.comarket.ee>)
3. Prisma Peremarket AS (<http://www.prismamarket.ee>)
4. Rimi Eesti Food AS (<http://www.rimi.ee>)
5. Stockmann AS (<http://www.stockmann.ee>)
6. Säätumarket (<http://www.smarket.ee>)
7. Maxima (<http://www.maxima.ee>)

There have been 28 shop visits to identify 9 labelled GM-products and 6 labelled as GMO-free in the period July 2006 - April 2007, rising to 13 and 17, respectively in the period April 2007 - April 2008.

Most of the soya products on the shelves contain no GM-soya as stated on the labels. Most of the GM-food available in Estonia is soya oil or food items containing soya oil as an ingredient:.

- 7 different edible oils containing GM-ingredients and properly labelled;
- margarines with GM-ingredients;
- snacks containing GM-oil;

- salads have recently appeared in supermarket containing GM-oil.

The main retailers are:

- Baltazar Trading AS (www.baltazar.ee)
- OÜ Claire Foods (www.clairefoods.ee)
- Rimi Baltic Group (www.rimi.ee), the only retailer who agreed to answer our questions. They have no special policy concerning GMOs

Discussion

The most intensive period of discussions about GM-food in Estonia was from 2001 to 2005, before the country joined the EU. The most important reason was a lack of information for the consumers. More information has become available following the launch of the “GMO-free Estonia” movement, most of it negative in character.

The political landscape is characterised by programme documents issued by the Green Party and the Estonian People’s Union who are allied in the hope of success in the forthcoming elections. The Estonian Green Party is the leading voice against GMOs in Estonia, with many articles from members of the party published in newspapers and magazines.

With regard to regional consumer attitudes, Ida-Virumaa, a county in the north-east located close to the Russian border, has a large Russian population who watch mostly Russian TV and read Russian newspapers. The Russian media tend to be anti-GM: below is an example of a report from Russia of GM-food being banned from schools and pre-school facilities in Moscow:

ITAR-TASS: G-modified foods to be banned from Moscow schools

MOSCOW, May 1, 20065 -- Foodstuffs containing genetically modified products will be banned from Moscow schools and pre-school childcare centers, the Moscow Mayor's office has told Itar-Tass, as follows from an instruction issued by Mayor Yuri Luzhkov.

“Scientists have not fully studied the effects of genetically modified products on the human body yet. The city authorities have decided to take precautions to protect the city’s population, in particular youngsters, from the unfavorable effects the use of such products may have, and to ban the g-modified foods from children’s diet”, the source said.

The packages of genetically modified products on offer at Moscow's supermarkets will carry the appropriate warning.

(<http://www.nwrage.org/index.php?name=News&file=article&sid=1316>)

Chapter 9

GERMANY

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Gabriele Sachse

Historical background

In Germany, the debate on agricultural biotechnology started in 1994 when the first GMO-soy products were introduced into the market. Neither large food companies nor politics were prepared for the discussion. On the other side, environmental and nature protection NGOs like BUND (*Bund für Umwelt und Naturschutz*) and Greenpeace were against agribiotechnology from the beginning and seized their chance. They started aggressive campaigns, using phrases like “Frankenfood” and “killer tomatoes”. Many round table discussions and dialogues (e.g. Unilever Gen Dialog 1993 to 1996) were initiated to find a common denominator among the different stakeholders. The so called Green Table (*Grüner Tisch*), initiated by former Minister Renate Künast, was the last in a long line of them. All the initiatives failed and revealed the irreconcilability of the different views.

Governmental issues

During recent years, German political parties have shown a wide variety of attitudes towards plant genetic engineering. Alliance '90/The Greens (*Bündnis 90/Die Grünen*) had ethical concerns about the application of this technology. The Left (*Die Linke*) spoke out against genetic engineering in their programmatic declarations. The Free Democratic Party (*Freie Demokratische Partei*, FDP) were in favour of GM-crops, focussing on the benefits they would bring Germany with respect to science, economy and global competition. The opinion of the two major political parties was influenced by consumers' attitude. The Social Democratic Party (*Sozialdemokratische Partei*, SPD) on the one hand were critical, whereas on the other they pointed out the economic importance such crops may have for the country. The Christian Democratic Party (*Christlich Demokratische Partei*, CDU) is basically in favour of agribiotechnology, seeing the benefits in regard to science. The Christian Social Union (*Christlich Soziale Union*, CSU) turned out to be more critical once since they acquired governmental responsibility within the current coalition.

The former government (1998-2005) led by the SPD and Alliance '90/The Greens, made its decisions almost unwaveringly against GM-crops. Chancellor Schroeder at that time promised the food and agricultural industry that he would follow a step by step schedule to give more room to “safe” agricultural biotechnology. However, this plan was never pursued. After elections to the Bundestag in 2002 the Red/Green coalition transferred responsibility for agribiotechnology from the Ministry of Health to the reorganised Federal Ministry for Food, Agriculture and Consumer Protection (BMVEL). Thereupon, Minister Renate Künast (Alliance '90/The Green) stopped research projects in agribiotechnology and implemented a more anti-GM policy. The competence in questions of security switched from the *Robert-Koch Institute to the Bundesamt für Naturschutz* (Federal Environmental Protection Agency).

After the elections early in 2005, the new coalition government gave notice of an amendment

to the German Genetic Engineering Law. The aim was to adopt more supportive regulations for research, development and the application of agribiotechnology. In addition, coexistence rules for traditional farming, organic farming and the cultivation of GM-plants were to be developed and implemented. Consumers were promised freedom of choice. Since the autumn of 2005, the German government, a coalition of CDU/CSU and SPD, has made some decisions which will allow a broader application and use of GM-crops in Germany, including commercial plantings of transgenic crops (Bt-maize in spring 2006). However, regional governments of the 16 German federal states have their own freedom in several aspects of decision-making as regards GM-crops. Those led by coalitions of SPD and Alliance '90/The Green did not support the further commercial implementation of GM technology for food production.

Early in 2008, the German *Bundestag* as well as the German *Bundesrat* passed the amendment of the Law on Genetic Engineering. The new law will be effective from April 2008. It amended the old law, regulates coexistence and introduced a new label GM-free label *ohne Gentechnik*.

Public discussion

The labelling of GM-products, cultivation of GM-crops, and questions of health and safety were extensively discussed. The large food companies were vigorously against labelling of GM-food, whereas NGOs like Greenpeace and the Öko-Institut clearly supported it.

In 2001, former Minister Künast invited experts and the various stakeholders to the *Diskurs Grüne Gentechnik*. Several meetings and discussion rounds were organized. The outcome of the discourse was a stalemate; neither side made any attempt to change their point of view. However, some of the matters discussed during the discourse are today regulated by the genetic law (e.g. the question of labelling).

By 1996, Greenpeace (GP) Germany had taken action with the *Einkaufsnetz* (shopping bag) and collected signatures against genetic engineering in supermarkets. On April 2, 2004, GP Germany started a new and very aggressive campaign against food products containing GM-ingredients or derived from GMOs. GP encouraged German consumers to act as “gene detectives” in supermarkets, asking them to look at packaged foods for labelled GM-ingredients and report back to GP. GP published and thus stigmatized these products on the internet (1).

GP announced its new campaign on April 2, 2004 as the proposed German Genetic Engineering Law was debated in the German *Bundesrat*. The German *Bundestag* already had passed the proposed labelling law. The CDU/CSU and FDP minority in the *Bundestag* – generally supportive of biotechnology – at that time had a majority in the *Bundesrat*. The *Bundesrat* rejected the proposed law which had been drafted by the Green-led Federal Ministry of Consumer Protection, Food and Agriculture (BMVEL), and forwarded it to the *Bundesrat/Bundestag* Conciliation Committee. The conservative majority of the *Bundesrat* demanded more than 100 revisions to the proposed law. The main point of criticism was the proposed liability rules which would make GM farmers liable for economic losses resulting from the presence of GM-material in a neighbouring non-GM-crop. The GM farmer would be liable even if he followed the official BMVEL rules for good management practices (GMP) for GM-crop production. To cover liability cases where full compliance with the GMP rules had been met, the conservative parties proposed the creation of a liability fund to be financed

by all parties involved in GM production (farmers, seed companies, the biotech. industry, etc.) and by public funding.

BMVEL Minister Künast complained about the *Bundesrat* decision to send the proposed law to the Conciliation Committee because this delayed implementation of special penalty rules for food and feed manufacturers that falsely labelled products containing GMOs. The proposed penalties ranged up to € 50,000 or a 5-year prison sentences. Critics of the proposed law claimed this proposed penalty level was excessive.

From the beginning, actions and campaigns to prevent GM-products in Germany have been successful. Consumers have either been afraid of health risks or failed to see any benefit of GM-food. The food industry was very reluctant to proceed: only one labelled product, the “Butterfinger” was launched (Nestle) but it was offered only by kiosks and not by the large retail chains.

Though no particular risk of GM-food had been actually identified, the food industry has tried to avoid GM-ingredients wherever they could. Even international companies like Unilever and Nestle changed their ingredients. In 2006, GP campaigned against the large dairy producer Campina. Several farmers delivering their milk to Campina had fed their dairy cows with GM-feedstock. Campina eventually promised to stop using such milk.

Present national/local political positions

After the early elections in 2005, the coalition agreement gave notice of a proposed amendment to the German Genetic Engineering Law. The aim was to adapt more supportive regulations for research, development and application of agribiotechnology. In addition, coexistence rules for traditional farming, organic farming and cultivation of GM-plants were to be developed and implemented.

The Federal Ministry of Nutrition, Agriculture and Consumer Protection (BMVEL) on its website provided facts on genetic engineering in Germany (2). Although the articles were rather short, some actual press reviews showed activities on LL RICE 601 which was found in conventional rice imported from US. Since for LL RICE 601 there was approval neither in the US nor in the European Union, putting the rice on the market was illegal. The marketing of long grain rice imported from the US was permitted only if an analytical report issued by an accredited laboratory proved that the product contained no traces of LL RICE 601.

For the implementation of the European Union decision, the German Federal Ministry of Nutrition Agriculture and Consumer Protection (BMVEL) issued an express regulation which was published on September 1st, 2006 in the federal legal journal. The German Federal Office for Consumer Protection and Food Safety (BVL) informed the authorities of the federal states and is currently discussing with them a national monitoring programme to analyse un-certified rice lines. Although, there are still no specific analytical methods for LL RICE 601, its presence can be detected by screening for the so called *bar* gene, which codes for the herbicide resistance.

At the end of September 2006, a genetically modified rice strain from China (Bt63) was detected in tests carried out on individual foodstuffs by food inspection authorities in Lower Saxony, Hesse and Hamburg, primarily in rice noodles. Since Bt63 rice was not approved in the EU, even such “minimal traces” found in the rice products were illegal: the products in

question were removed from the shelves. Based on plant samples from China, a viable detection procedure has recently been developed in Germany.

German State Secretary Gert Lindemann at the time told *Agra-Europe* that Germany will use its EU Presidency to look again at the approval procedure for GMOs. In April 2007, the European Commission made changes to the risk assessment conducted by the European Food Safety Authority (EFSA). The basic question was whether scientific arguments were too easily outweighed by political ones. The decision about the approval of the GM-carnation “Florigene Moonlite” was cited as an example: Although the flower was not intended for consumption and cultivation, and was unable to produce seeds, three member states voted against the approval and five abstained. German officials also criticised the EU for not properly addressing the co-existence issue, pointing to Hungary as an example. Hungary is home to a huge seed industry and has little economic interest in importing GMOs; the Hungarian industry fears potential losses from GM presence in their seed lines.

In May 2007, Germany imposed a temporary ban on the commercial sales of MON810 maize, citing concerns about product safety. The maize is resistant to several types of caterpillars which are economically relevant pests in Europe. In December 2007, German authorities lifted this temporary sales ban after Monsanto, the company producing the seed, agreed to extra crop monitoring in Germany. MON810 had already been approved as safe for commercial use by the European Union but several countries in addition to Germany have expressed concerns about its safety. According to Monsanto, German farmers had planted 2,680 hectares of GM-maize for commercial use in 2007.

In January 2008, the German ruling coalition of CDU/CSU and SPD agreed to allow foodstuffs containing certain GM-additives or produced with the help of GM-processing aids to be labelled as non-GM if there was no production alternative. Germany has had a labelling system for non-GM food – including food derived from animals raised without GM-feed – since the 1990s. In practice, however, this label has not been taken up by the industry because the regulations are extremely tight and extensive documentation is required to substantiate the non-GM claim.

Modification of the regulation was agreed to allow the use of GM-vitamins, additives and processing aids where there is no non-GM alternative available, and still allow the end product to be labelled as non-GM. This includes the use of animal-derived material from animals raised on feed containing vitamin B12 and lysine which are made only by GM-processes. The intention of the regulators is to encourage the food industry to start using the non-GM labels as announced by several companies in February 2008 (e.g. Wiesenhof, a poultry producer). This legislation will come into force in January 2009 and will open the way for the use of GM-produced additives for which there is no alternative in organic production. The German coalition government therefore extended the spirit of this legislation from organic to conventional production methods.

But industry is not really convinced by this change, feeling it might be misleading for consumers. Consumers will probably believe that there is no GM-ingredient in the product while internet sites opposed to genetic modification proclaim the possible use of GM-enzymes and GM-vitamins (3).

In February 2008, Germany passed legislation making it easier for farmers to sow genetically altered corn. Chancellor Angela Merkel’s coalition steered legislation through parliament in

Berlin outlining new rules on sowing Bt-maize MON180.

The legislation followed a decision in 2006 to overturn an eight-year freeze on the sale of MON180 seeds agreed by the previous SPD/Alliance '90/The Greens coalition government. Agriculture Minister Horst Seehofer said that his decision to give the go-ahead for MON180 aimed at helping Germany's biotechnology industry.

The new legislation obliges farmers who want to sow MON180 to set a 150 m "safety zone" between the plots and neighbours growing regular GM-free corn. Farmers need to establish a 300 m zone separating plots adjacent to organic crops. Three months before the April-May planting season, farmers will have to report GM-sowing plans on an internet register.

In March 2008, the German Bundestag rejected a request of the Green Party to ban the import and sales of MON810. The coalition of Christian and Social Democrats as well as the Liberal Party (4, 5) voted against this motion.

Products on sale labelled "contains GM" and/or "GM-free"

All retailers (including discounters) have declared a ban on GM-foodstuffs, telling their suppliers to avoid any GM-ingredients. Thus, virtually no such products can be found in German supermarkets. If a GM-product appears on the shelves and is recognised as such, the retailer chain is eager remove it as quickly as possible quickly. Individual statements from retailers are provided in Appendix 1 (page 9-18).

The requirements for suppliers set by retailers are strictly in accord with legislation:

- procedures for GMs handling have to be defined;
- traceability of GMs should be in place, controlled and documented through the whole production process;
- specifications for GM-raw materials have to be provided;
- statements of supplier on the use or non use of GMs is required;
- manufacturers have to install procedures to avoid potential contamination;
- labels have to be correct;
- the client's requirement for non-GM-produce must be incorporated in the Quality Management System.

On the other hand, both the larger and some smaller chains have to deal more and more with Greenpeace targeting the milk from cows provided with GM-feed. Retailers want to offer an alternative to consumers and some have launched products with the label *ohne Gentechnik* (without genetic engineering).

During the course of this CONSUMERCHOICE project, the "old" GE legislation was in place with very strict criteria for the use of an *ohne Gentechnik* label. Thus, only a small range of GM-free labelled foods was on sale (see Survey of purchasers of non-GM-products, page 9-7). In ethnic food stores in Frankfurt (large city), soy oil and a small selection of other



Fig. 1: Milk labelled *Ohne Gentechnik*

products, e.g. dressings (*Würzsoßen*) labelled “contains GM” were found. Except for soy oil, all other products were withdrawn from the shelves after the owners were approached about their GM-products.

Table 1. GM-products found in Germany by Greenpeace “Gene Detectives”

product	producer/importer	date of recording
Sedina reines Pflanzenöl 10 L	Ölmühle Hamburg AG	11.4.2007
Sola Gold – Pure Vegetable Oil 10 L	Karl Heidenreich GmbH – Mannheim	20.8.2007
Delikates Pflanzenöl	Ölmühle B. Schell GmbH, Lichtenau	19.1.2007
Heidenreich reines Pflanzenöl	Karl Heidenreich GmbH, Mannheim	27.10.2007
Lydia-Pflanzenöl-Slaolie	ILG – Ichoh Levensmiddelen Gastronomie B.V. Grrot- en Kleinhandel, Enschede	25.10.2007

Oils in 10 l containers are bought by restaurants (excerpt from the Greenpeace list dated January 31st, 2008)

Contacts with retailers

We have consulted several retailers in Germany who have or will in future introduce products labelled *ohne Gentechnik*. One retailer promised us actual sales data. This was accompanied by interviews with consumers in supermarkets at the end of March/beginning of April 2008.

An organic food store was also contacted and agreed to cooperate; from them we obtained more data about products with the *ohne Gentechnik* label (see Survey of purchasers of non-GM-products, page 9-7).

Sales Data

One retailer provided the CONSUMERCHOICE team with sales data on a branded non-GM-milk (which in March 2006 became the retailer’s own-label product) as well as on comparable branded organic and conventional milks (see Appendix 2, Fig. 13, page 9-20).

It is clear that the conventional milk, the cheapest of the products analysed at € 0.55 per litre, has the highest sales figures. A little surprising were the relatively high sales figures for organic milk which was almost 60% more expensive than conventional milk. This might be explained by the strategy and positioning of this specific retailer who has a 30% organic product share in his food turnover. The organic milk sales were also promoted by media reports on “rotten meat” and other food scandals. The sales of non GM-milk were the lowest.

The next range was tofu products in organic stores. Tofu is made from soy. Although the regulation on organic farming and processing does not allow the use of genetic engineering, some organic producers emphasize this fact with their own label.



Fig. 2. Labelling of organic food in Germany according to EU Eco Regulations

We wished to determine whether the label has an influence on the sales of these organic products (see Appendix 2, Fig. 14, page 9-20). All soy sausages were the same price. We compared two different flavours, each a product labelled as “GM-free”. We do not know the influence of flavour on purchasing decisions but the store manager confirmed that in his view it was indeed a motivation.

Another set of data was retrieved for the sales of tofu labelled “GM-free” on the front versus another labelled “GM-free” on the back (see Appendix 2, Fig. 15, page 9-21). The product labelled “GM-free” on the front had the higher price. It is interesting that, at the beginning of the survey, consumers preferred the cheaper product. In the course of time the sales data equalled. The explanation may be that consumers felt more confident with the products labelled “GM-free” on the front, the price being secondary. Consumers apparently have little time (or interest) to read the list of ingredient.

Survey of purchasers of non-GM-products

The examples above indicate the market in Germany for products labelled as non-GM. Only a consumer survey with face-to-face interviews can elucidate the motive(s) for those choices. The aim of this survey was thus to check the proposition that “German consumers buy non-GM-labelled dairy products to support the feeding of cows with non-GM-fodder and to avoid products from animals supplied with GM-feed.”

Fig. 3. Retail brands *Ohne Gentechnik*

The retailer who supplied CONSUMERCHOICE with the sales data on milk agreed to ask his customers why they purchased one or more of the seven items labelled *ohne Gentechnik*. He arranged for the exercise in the stores; customers were offered a small gift after their interviews. The questionnaire was designed in line with the GfK questions (see Chapter 6, page 6-20) for comparability of results. Just five of the ten GfK questions were used so as to curtail interview time which took about two minutes for each person.



Survey

Questions for the Purchase of Dairy Products with NON-GE Label

You have selected a product with Non-GE label

1	Why have you decided to choose this product? (Several answers possible)	<input type="checkbox"/> → because of retail brand <input type="checkbox"/> → because this product is without genetical engineering → (Do you know the application? _____) <input type="checkbox"/> → because this product tastes better than others <input type="checkbox"/> → because this product is healthier <input type="checkbox"/> → Other: _____			Comments
		Yes	No	I do not know / Sometimes	Comments
2	Do you prefer to buy food which is labelled with Non-GE?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Do you inform yourself if a product contains genetically modified ingredients?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Would you buy food which contains genetically modified ingredients?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Do you read the ingredients list before you buy a specific food?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

male → female → → Age: _____

Survey in connection to EU Project Consumer Choice, G. Pohl-Apel, S. Pfaff (04/2008) → → → → → → → → Page 1 of 11

Fig. 4. Questionnaire for the face-to-face interviews

Together with the retailer, we selected four supermarkets in three cities with good sales figures for dairy products: Fulda (69,400 inhabitants), Wiesbaden (270,000), Eichenzell (11,100) and Würzburg (131,000). The interviewers approached the buyers directly after they had selected the dairy products. In total 317 consumers were interviewed.



Fig. 5. Share of selected products (yoghurt, 0,1%, 1,5%, 3,8%; milk 1,5%, 3,7%; cream and sour cream = 7 articles)

It was important to have a high proportion of milk purchases in this survey because the variety of milks was far greater than for cream and sour cream. The consumer could select between 12 different milks (conventional, *ohne Gentechnik* and organic). We interviewed 68% women and 32% men; with couples, the respondent who answered most of the questions was counted. Age clusters between 30-39 and 40-49 were better represented than in the German population as a whole: these are shoppers who are very likely have children in their households.

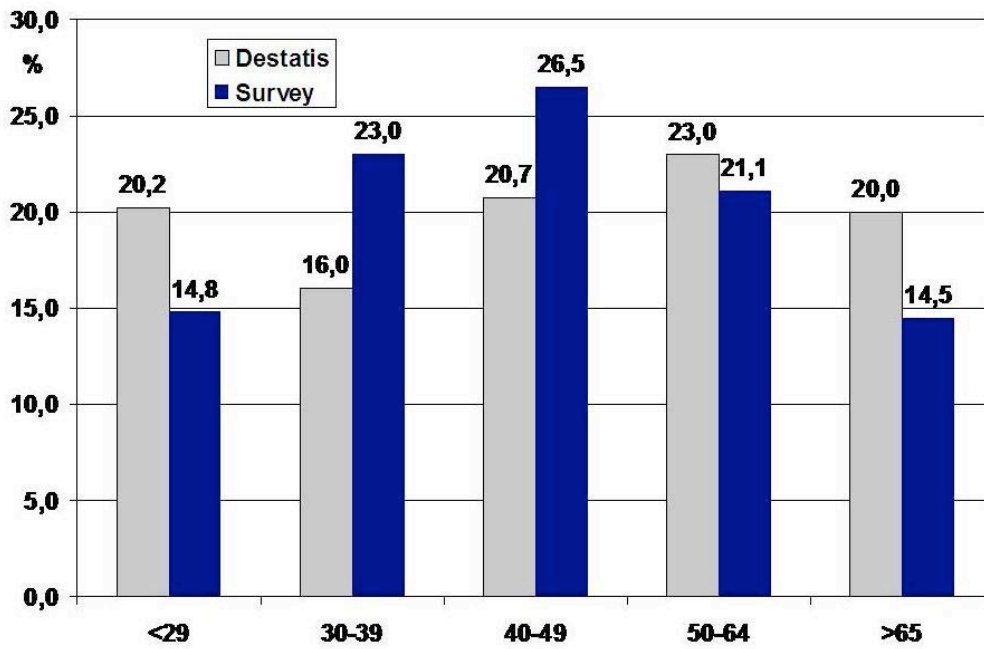


Figure 6. Age clusters of the German survey compared with German age clusters (source Destatis – statistic centre of Germany)

If they wished – and had multiple motivations for their choices – respondents could offer more than one answer to this question.

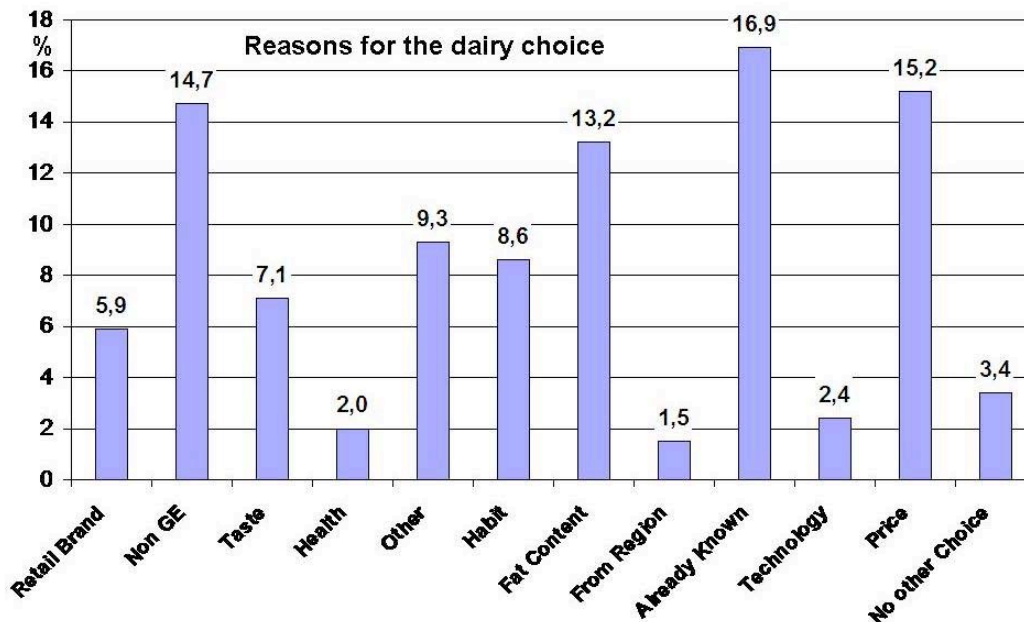


Figure 7. Reasons for the choice of dairy product

We can see that while *ohne Gentechnik* is a strong motivation, over 80% of the respondents had other reasons for buying the product. These consumers are inclined to buy organic. Thus, they compared the price of the GM-free milk with the organic product and argued that GM-free milk was cheaper although the cheapest choice of all would have been the conventional milk. For some consumers, the fat content was the most important reason for buying the product.

Comparing the answers to the questionnaire where shoppers were offered four main reasons plus “other” reveals a rather surprising variety of reasons. More than seven different answers were given spontaneously, including habit, fat content, regional origin, familiarity (“I always choose this milk, I don’t know why!”), technology (“this is pasteurized; I prefer this technology”) and price. As well as exploring the motivation for the purchase of these products, shoppers were asked whether they actively inform themselves about GM-ingredients and if they would buy GM-food (Fig.8).

questions	yes	no	don't know	sometimes
Q2) do you prefer to buy food which is labelled with Non GE?	49.5%	40.6%	1.9%	8.0%
Q3) do you inform yourself whether a product contains genetically modified ingredients?	31.2%	51.6%	3.2%	14.0%
Q4) would you buy food which contains genetically modified ingredients?	12.5%	74.4%	5.8%	7.3%
Q5) do you read the ingredients list before you buy a specific food?	44.4%	26.0%	7.9%	21.6%

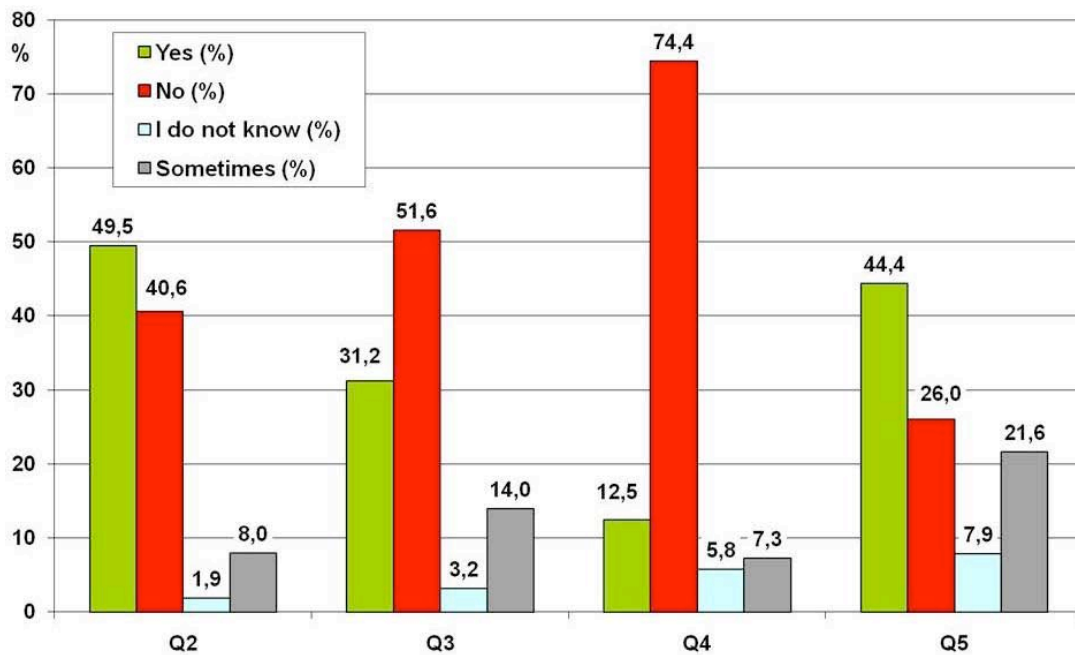


Fig. 8. Results for Q2 - Q5

About half the respondents indicated a preference for products with *ohne Gentechnik* labels; the rest had other clear reasons for their choices or were uncertain. This correlates with a survey by Willers (2007) (6) who asked 1,000 Germans for their opinions on genetic engineering: 32% replied that they were indifferent and neither favoured nor opposed the technology for food production; 12% were in favour and 56% against.

Our own data clearly show that many consumers are not really interested in understanding the issues. In response to question 3, only 31.2% indicated that they informed themselves about

GM-ingredients in a product while 51.6% wanted no information. There was also the suggestion that “the retailer should guarantee the supply chain with respect to food safety and an absence of GM”.

The active purchase of GM-food (Q4) was declined by 74.4% with only 12.5% in favour. The remainder (13 %) were uncertain and said they would look for other benefits like taste or price. In a way, the answers to question 5 contradict the finding of a high proportion of respondents who said they rejected GM-foods: only 44,4% read the list of ingredients when they buy food. A third of the consumers interviewed would probably buy GM-food because they do not check the ingredients. These finding have parallels in the behaviour of UK residents visiting North America, some of whom knew that GM-foods are prevalent there – which said they wished to avoid – yet took no steps to identify them or any avoiding action (see Chapter 16, page 16-14).

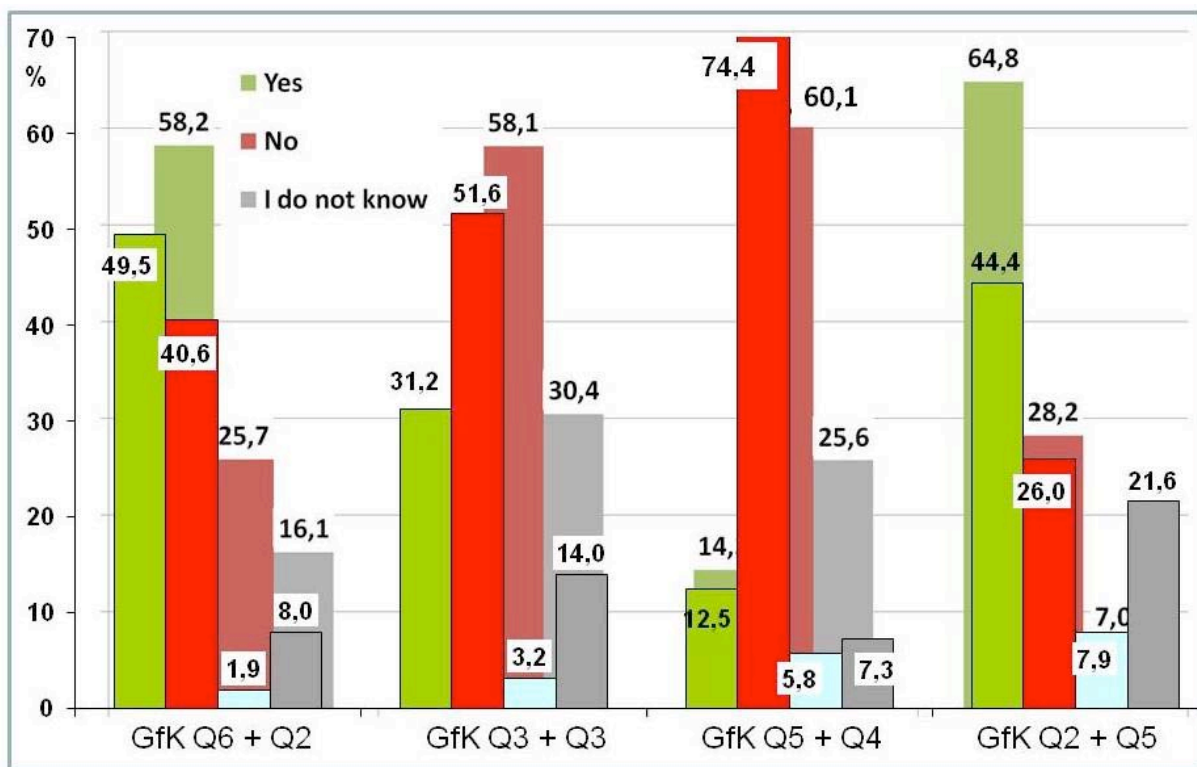


Fig. 9. Comparison with GfK results (background = GfK results, foreground = own survey; light blue = don't know, grey = sometimes)

The survey was designed to parallel to the German GfK questions (see Chapter 6, page 6-20) but the order of the questions was changed. And, of course, this in-store survey entailed a direct approach to consumers in the store whereas GfK used their household panel and different methods for the interviews.

While the GfK survey differentiated between buyers and non-buyers, for the in-store survey comparison only purchasers of foods labelled as *ohne Gentechnik* were selected.

questions Q2 – Q5 – direct interviews GfK Q2 – GfK Q6 – questions by GfK	yes	no	don't know	sometimes
Q2) Do you prefer to buy food labelled <i>ohne Gentechnik</i> ? GfK Q6) I prefer food which is labelled with non-GE.	49.5% 58.1%	40.6% 25.7%	1.9% 16.1%	8.0%
Q3) Do you read the label to find whether a product contains GM-ingredients? GfK Q3) I inform myself as to whether a product contains genetically modified ingredients.	31.2% 11.5%	51.6% 58.1%	3.2% 30.4%	14.0%
Q4) Would you buy food which contains GM-ingredients? GfK Q5) I would buy food which contains genetically modified ingredients.	12.5% 14.3%	74.4% 60.1%	5.8% 25.6%	7.3%
Q5) Do you read the ingredients list before you buy a specific food product? GfK Q2) Before I chose a specific food I do read the ingredients list.	44.4% 64.8%	26.0% 28.2%	7.9% 7.0%	21.6%

The comparison revealed that we could confirm the trend in every question. Adding the answers for “sometimes” and “yes” in this survey generated numbers close to the those of the GfK survey. The only difference is about reading labels to identify possible GM content (Q3 and GfK Q3). Perhaps the consumers in the in-store survey were better informed than usual and hence able to make an informed choice whereas almost a third in the German GfK survey did not know how to distinguish between GM- and conventional foods.

The state of public discussion: who is saying what to whom?

On April 16, 2002, the German-language version of GMO Safety (*bioSicherheit*) went online (<http://www.gmo-safety.eu>). The intention was for everyone to form his own opinion about opportunities and risks of genetically modified plants. One of the goals was to ensure a better perception within the public debate of the topics and results of safety research into genetically modified plants.

Today, almost six years after that launch, public reservations concerning plant genetic engineering have not obviously changed. In an interview with GMO Safety and Wolfgang van den Daele the continuing conflict surrounding crop genetic engineering and the strained relations between science and society were discussed (7); an English translation is provided in Appendix 3 (see page 9-22).

Van den Daele concluded that scientists are not able to reach consumers and build trust by publishing research data. They tend to be too engaged in their discussion with other scientists and do not speak the language of consumers.

For years, the German government supported the websites <http://www.transgen.de> and <http://www.biosicherheit.de> which offer background information, news and discussion panels.

The presentations are scientifically oriented: scientists gain information from these pages and some journalists use them for writing background articles while students find them useful for their term papers. But they are not recognised by and are of little value for the average citizen. Even politicians use other sources. The main source of information for interested lay people probably are daily newspapers together with news items from GP and other NGOs.

The voices of the media

The print versions of the *Frankfurter Allgemeine Zeitung*, *Frankfurter Rundschau* and *Weilburger Bote* were screened on a daily basis for articles on GMOs. The print editions of the magazines *Der Stern*, *Der Spiegel* and *Brigitte* (a women's magazine) were similarly screened on a weekly basis as were electronic press clippings (*Paperball*, *die Newssuche*). In addition, *interpharma.ch*, a GM-relevant E-mail clipping service, was screened daily. In total, 78 newspapers were covered during project duration (see Appendix 4, page 9-25). The number of articles were counted, clustered and summarised for each month in the period from July 2006 to March 2008.

In the context of food, the media in Germany mainly covered more popular issues like rotten meat for human consumption. Coverage on genetically modified organisms and food is triggered from time to time by a news event. During the period of our investigation, German media interest in GM-items was not very high (see Fig. 10).

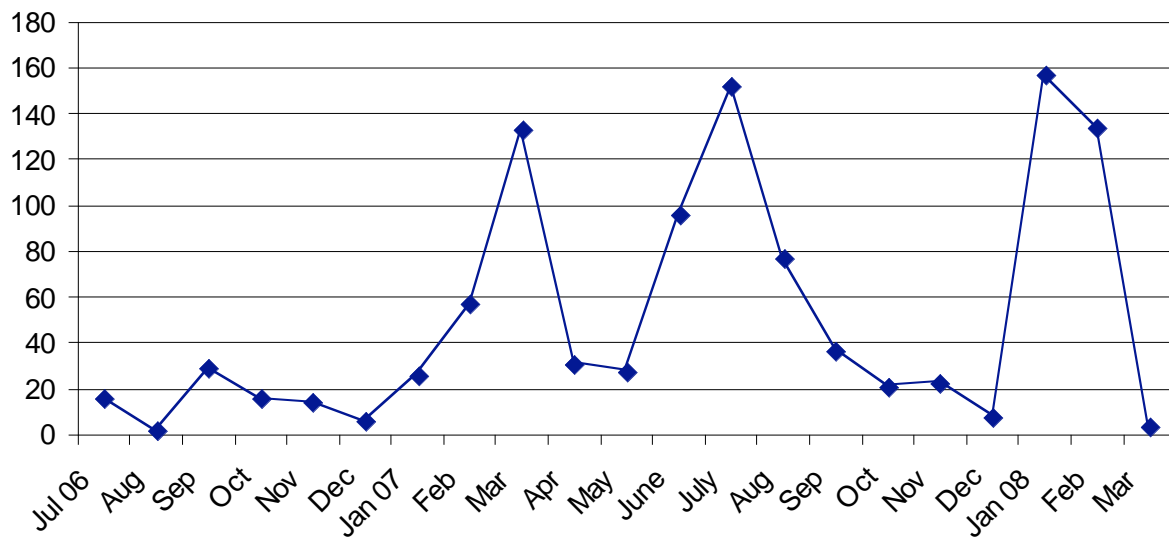


Fig. 10. Number of press items per month (July 2006 to March 2008)

As can be seen from Fig. 10, in 2006 a small peak occurred in September. In 2007 there were peaks in March, July and August. In 2008 most items were published in January and February. These peaks can be referred to the following issues:

- **September 2006:** Non-approved GM-rice was detected by authorities in Hamburg. Withdrawal of rice in supermarkets followed;
- **March 2007:** There were nationwide protests against the cultivation of GM-maize. According to the German law, farmers had to indicate in a database how much and where they were going to grow GM-maize. Greenpeace used the register to make the fields

public and thus targets for protest actions;

- **July 2007:** Protests against cultivation of GM-maize, first discussion of the first draft of the amendment of the German Genetic Engineering Law;
- **January and February 2008:** the amendment of German Genetic Engineering Law was announced and discussed. In particular, the change of the labelling regulations triggered different responses from NGOs and industry. The amendment of the German Genetic Engineering Law was adopted.

The contents of the media reports are mainly along the following lines:

- GM-cultivation in general (includes growing GM-maize, wheat and potato and discussion about cultivating or not cultivating);
- non-approved found GM-rice in retail stores;
- amendment of German Genetic Engineering Law.

The distribution of media items of GM-issues on a monthly basis shows that interest is generally low but with some peaks. The pattern suggests that media coverage of GM-issues is event-driven rather than opinion-led.

In September 2006, GM-rice was detected in supermarkets. With 26 reports, the media response was not at all spectacular. The tenor of the articles was more or less neutral, whereas the headlines sometimes served as negative teasers (e.g. *Bild-Zeitung*). An explanation for the more neutral content might be that authorities and retailers acted promptly and all “contaminated” rice was rapidly removed from the stores.

The media interest in GM-in March 2007 referred: (a) a study conducted by GP in which it was claimed that rats fed on maize MON863 developed health problems; (b) beginning of the growing season and publication of GM-maize acreages in the official register.

In July 2007, the vandalising of GM-maize plants in one region of Germany (Brandenburg) generated major media interest. The action was announced in advance resulting in police protection for the GM-field. In this context, NGOs initiated a broad discussion on their views of the health and environmental risks of GM-maize. In August, the first discussions took place on the amendment of the German Genetic Engineering Law; opponents of genetic engineering feared that regulation would be too liberal.

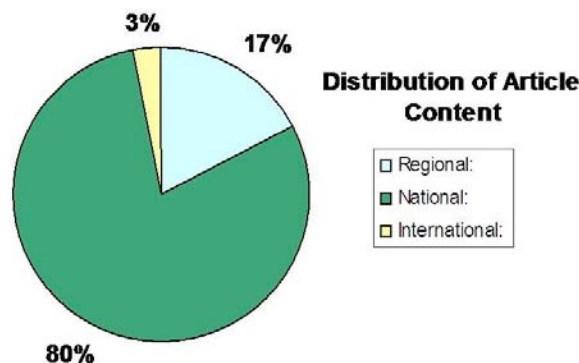


Fig. 11. Distribution of selected articles (n = 1078)

January/February 2008 saw the adoption of the amended German Genetic Engineering Law; again there was considerable media response.

Fig. 11 shows the percentage of the total number of media entries with nationwide, regional or international relevance. Though the majority of daily newspapers are regional, the majority of articles published in newspapers had nationwide relevance.

Irrespective of the controversial discussion in Germany, the analysis revealed that the majority of articles (including press releases and reports) could be classified as neutral.

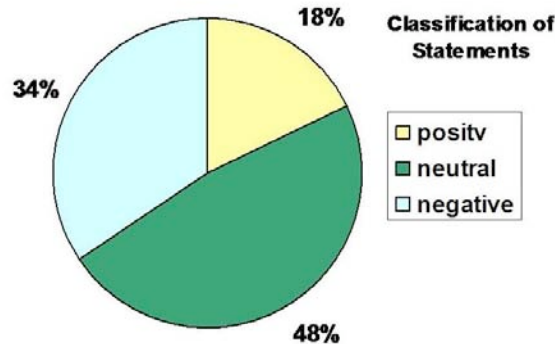


Fig. 12. Classification of selected articles (n = 1078)

Other relevant information from Germany

Survey at the University of Cologne

Although there are no GM-products presently on the German market, nobody involved in the food chain doubts that genetic engineering will become more important in the coming years. A survey deducted by the University Cologne from November 2006 - February 2007 showed that a range of reasons for acceptance and refusal of genetically modified food exist in Germany (6). The survey divided the German population according to their opinions on genetic engineering. For this survey, a qualitative basic study (depth interviews and focus groups, n = 48) was followed by a quantitative examination (CATI inquiry in Germany, n = 1000).

The majority of German consumers so far were not convinced of the advantages of agricultural genetic engineering. On the contrary, uncertainty and scepticism were widespread giving rise to substantial concern.

With respect to their fundamental attitude towards the use of genetic engineering in agriculture and food production, 56% of the population were negative, with 31 % following their emotions and only 25% their reasoning. Thus, rejection was predominantly emotional rather than rational. One third of the population remained undecided.

Using cluster analysis, five consumer segments could clearly be differentiated:

- refusal (16%)
- distrustful-fearful (30%),

- uninterested (18%),
- open minded-fearful (20%)
- proponents (16%).

It is remarkable that it was the distrustful-fearful group that was pre-eminent, not the refusers. That group is governed by uncertainty and fears triggered because they perceive no personal benefits from genetically modified food. Another surprise, after so many years of heated discussion, was the relatively large group of people apparently completely uninterested and failing to display any involvement in the topic.

The group of the open minded-fearful people presents itself as liberal while at the same time was strongly influenced by affective-oriented reservations. The proponents presented themselves as enlightened and rationally convinced of genetic engineering but they do not act as opinion leaders.

In summary, the survey showed that the attitude towards genetic engineering was essentially determined by affective dimensions and not by cognitive evaluations: knowledge, social demographic variables and purchasing behaviour did not play a significant role for the view (except for their high preference for organic products where some of the criteria fit). This survey strongly questioned the assumption that the rejection of GM-food is a knowledge and/or information-driven phenomenon.

The study concluded that, to encourage a more positive attitude towards genetic engineering, it would be necessary to overcome the affective reservations in order. The younger ones, the indifferent ones and the “emotionally” negative ones might be the target groups. The only group which would not be reached by marketing initiatives is that of refusers. It would be important for GM-foods actually to be available during these initiatives. Apart from a target group oriented communication, for the consumer the unavailability of GM-foods (“phantom products”) poses a major central problem in the discussion. Buying behaviour and food consumption are often heavily influenced by product availability. The rejection of GM-foods would be diminished if such products were actually freely available.

What does the future hold?

We expect that consumer behaviour towards GM-foods might change in the future if food prices continue to rise, a conclusion supported by an actual survey conducted by EMNID in Germany in April 2008 (8).

With global warming and the food crisis in the headlines all over Europe, the rejection of GM-food is obviously decreasing. Some 56% of participants say they would be willing to eat GM-food if the food crisis could be attenuated, of whom 13 % would do so immediately and 43% were prepared but “with reservations”. Nevertheless, 42% would continue to oppose GM-food.

Age plays a role, with people younger than 50 being more willing to change their attitudes. In the representative survey, 1,000 Germans were interviewed (8).

References

1. http://www.greenpeace.de/themen/gen-technik/lebensmittel/artikel/gen_alarm_liste_gekennzeichnete_lebensmittel/
2. <http://www.bmelv.de>
3. <http://www.keine-gentechnik.de/dossiers/ohne-gentechnik.html>
4. http://www.bmelv.de/cln_044/nm_754188/DE/04-Landwirtschaft/Gentechnik/NovellierungGentechnikrecht2.html_nnn=true
5. <http://www.transgen.de/aktuell/893.doku.html>
6. Willers, C. (2007): *Marketing in Widerstandsmärkten – untersucht am Beispiel gentechnisch veränderter Lebensmittel*, Beiträge zum Produkt-Marketing, Fördergesellschaft Produkt-Marketing e.V., Köln, Band 40, S. 3
7. www.gmo-safety.eu, 2007
8. <http://www.neuepresse.de/newsroom/wissen/zentral/wissen/art1021,578457>

APPENDIX 1: GMO STATEMENTS BY GERMAN RETAILERS

(translated)



The EDEKA (No. 1 in Germany) received statements from suppliers that in the EDEKA Own Brands no genetically modified organisms are contained which must be labelled. Thus the customer decides on the purchase of approximately 1600 products, which are sold under the labels GUT&GUENSTIG, Bio Wertkost and, Rio Grande not to buy GM products. The industry was asked by the EDEKA to inform about all products which have to be labelled. Since so far no such messages were received, so it is assumed at the current time no products are delivered with GM ingredients.

Source: <http://www.edeka.de/EDEKA/Content/DE/AboutUs/Presse/Themen-Spezial/Gentechnik/index.jsp>



REWE Group (No. 2 in Germany) agreed with its suppliers for Own Brand products contractually that the use of genetically modified organisms expressly requires written permission. Such permission has not been granted by the REWE Group so far nor do they intended to do so in the future.

Source: <http://www.rewe-group.com/index.php?id=78>



Metro Cash & Carry, C+C Schaper, Real, Extra and Galeria Kaufhof keep to all the European Union guidelines. The METRO Group (No 3. in Germany) so far have no products which would require GM labelling according to the GM regulations. If this should be in the future the case, it will be indicated on the packing or in the product description at the display.

Source: http://www.metrogroup.de/servlet/PB/menu/1100870_11/index.html



Kaufland (part of Schwarz Group which is No 4 in Germany) does not wish on principle to trade articles are made of GMOs or consist of GMOs or contain to trade ingredients derived from GMOs. In the context of our own brand programme k-Classic we have consciously forgone the use of genetically modified organisms and have contractually advised our suppliers of this company maxim.

Source: <http://www.asta.uni-potsdam.de/sonst/ausgabe.php3?textfile=2235>



Aldi discounter is No. 5 in Germany.

The (empty) statement on the Webpage:

“Do you offer GM-Food? ALDI SÜD is committed to provide their customers with all statutory information on production and origin as well as ingredients of foodstuff. On April 19, 2004, the comprehensive Regulations of the

European Parliament concerning the traceability and labelling of genetically modified organisms and traceability of food and feed products produced from genetically modified organisms came into effect. ALDI SÜD emphatically supports the clear declaration rules for GM food in Europe and implements the labelling of genetically modified food without any reservation. According to the new law, all food products that incidentally or for technical reasons unavoidable contain more than 0,9 percent GMO which are permitted in the EU have to be labelled. Furthermore, we bind our suppliers to implement the new regulation – as all regulations – in full extent. Only by a consequent labelling, our customers will be enabled to make an informed purchasing choice.” Source: <http://www.aldi-sued.de/de/html/service/3424.htm>



Tengelmann declared via E-mail that they do not offer products which have to be labelled. This position will not change in the near future.

Tengelmann is No. 6 in Germany.



Nothing found. E-Mail to the service team on 20.03.08.

Globus is No. 10 in Germany.

APPENDIX 2: RETAIL DATA

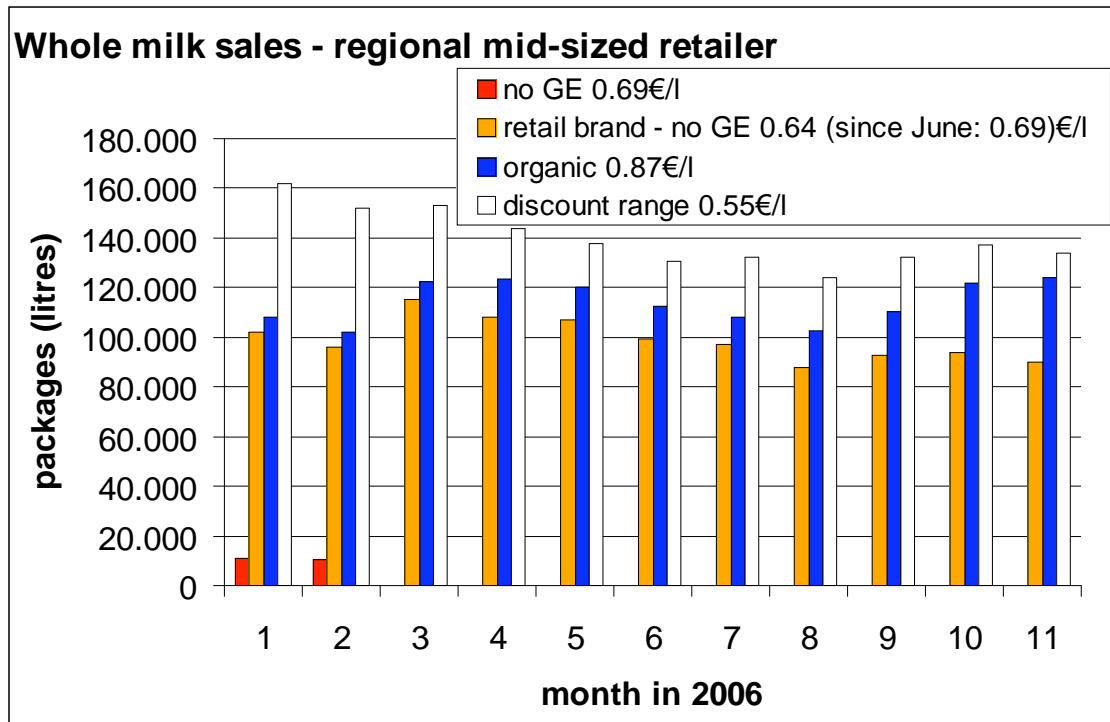


Fig. 13. Sales data of Non-GE milks (industry brand, retail brand), organic and conventional milk (Data from 2006)

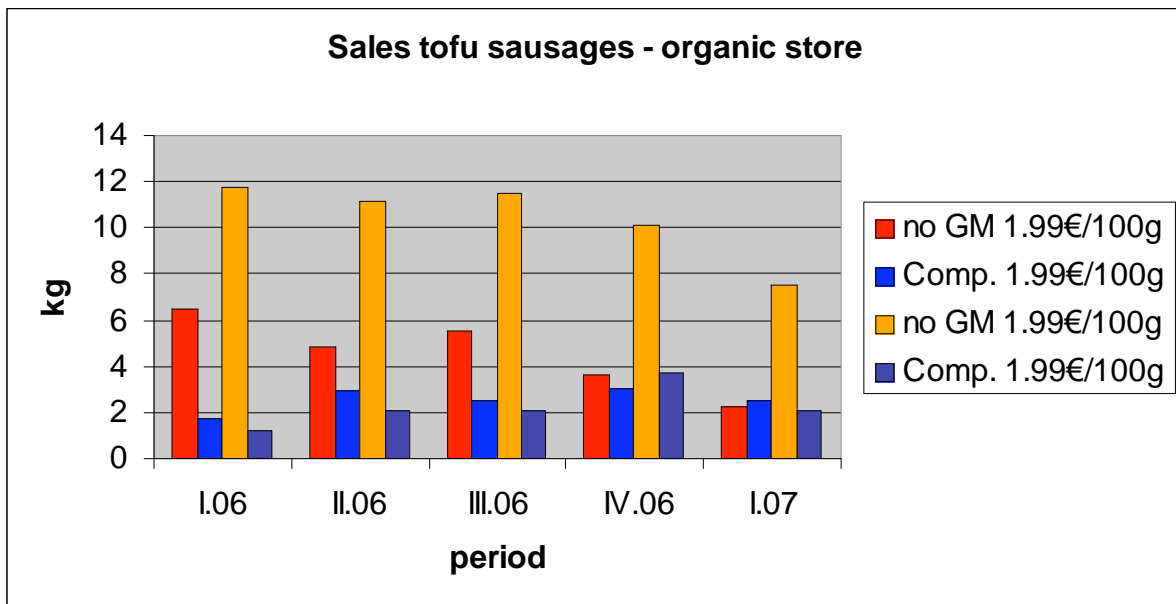


Fig. 14. Sales data of organic products labelled *ohne Gentechnik* compared with “normal” organic products (tofu sausages).

Red: taste 1 – label “GM-free”; blue: taste 1 – no label
 Orange: taste 2 – label “GM-free”; Dark blue: taste 2 – no label

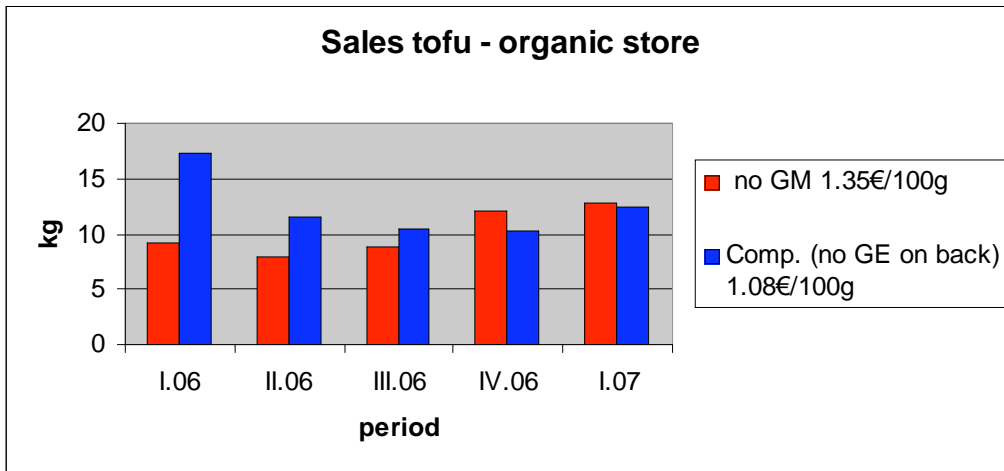


Fig. 15. Sales data for tofu sales in an organic store

Red: label “GM-free” on front of package; Blue: label “GM-free” on the back of package.

APPENDIX 3: PUBLIC DISCUSSION ON GMOS AND GENETIC ENGINEERING (INTERVIEW)

GMO Safety: Public reservations concerning plant genetic engineering in Germany appear to have increased even further over the past five years. The view that genetically modified plants are “not safe” or have scarcely been researched in terms of their potential risks is almost taken for granted. Under these circumstances, what impact can technical information have? Are we talking about gaps in people’s knowledge that are to be filled by means of scientific explanation?

Wolfgang van den Daele: It is indeed astonishing that the risk argument still meets with such a broad response, despite the fact that no particular risks have actually been identified. It is true that there are always the odd hypotheses, which later turn out to be nothing significant. And if there are special safety concerns, the construct in question is withdrawn from the market or not authorised. As a neutral observer, one would say that the risk debate has no foundation.

It seems to me that risk functions as a kind of catch-all category. People have something against this technology. They don’t want it, find it unnecessary or wrong. The impression that the technology is problematic has taken hold to an incredible extent. It is paradoxical: The more one tries to educate the public or engages in public dialogue, the more this impression is reinforced. If we make such a song and dance about it, people think, there must be something fishy.

This kind of unease finds a legitimate expression in risk. People will always fall back on the risk argument. And if they cannot find a specific threat, they say that the potential risks have not been sufficiently well researched. This pattern has been established by the *social movements that want to prevent crop genetic engineering* – and there is practically nothing that can be done about it. We must of course use scientific explanations. But this is a minimum requirement. If we don’t do it, we are providing another argument. We have to explain, but cannot assume that this will resolve the unease or rejection. Information and transparency are necessary. But this is not the battlefield on which the outcome will be decided.

GMO Safety: Scientific perspectives have only a limited power of explanation in social debate. Public perception – e.g. overstating the risks of transgenic plants – is based more on cultural aspects. What do these perceptions feed on?

Wolfgang van den Daele: My guess is that people have found a symbolic arena in which they can put up a resistance to the dynamic force of technology, which has them at its mercy and which is steamrolling society. In the area of crop genetic engineering people can resist without their own interests being affected. This will remain the case as long as consumers and the general public perceive no personal benefit. They like to see the fight between David and Goliath: social movements, farmers and environmental associations on the one side, and – on the other – big business, which is being shown its limits. A secret sympathy for the obstructive path being pursued by the social movements cannot be ignored.

GMO Safety: Doesn’t society’s risk perception also have something to do with the prevailing understanding of nature or ethics of nature?

Wolfgang van den Daele: I don't think so. People can accept all kinds of deformation of plants. And the fact that it is genes that are now being modified is not breaking a taboo. Interestingly, there is no objection to "smart breeding" (modern molecular biological breeding techniques), which is used to do the same kinds of thing to plants that genetic engineering is used for. Nor is there any objection to genetic engineering in the field of medicine. If it appears beneficial, people have no problem with the fact that genes are being manipulated.

GMO Safety: An important issue is trust. If you trust someone, you will follow their assessment of a complex issue in an area where you yourself do not have any expertise. In this sense scientists can no longer assume that society trusts them. What can scientists do to win back people's trust? In a media society can you expect people to trust them at all and allow them special expertise?

Wolfgang van den Daele: I don't perceive this general loss of trust. People are always running to the doctor and relying on professional expertise. But in areas which are politicised, like crop genetic engineering, the limits of expert knowledge are clearly visible. When it comes to an argument, when the issue at stake is the legitimacy of a development, people withdraw their trust from the expert because he knocks their cherished arguments out of their hands. This is the point at which one says: I don't trust them. And with that one disposes of the scientists' power to define their arguments. Now it is easy to accuse them of acting only on their own interests or on behalf of industry. If you don't say "I don't want it" directly, you say "I don't trust them". If a scientist claims that there are no risks, you say "I don't trust you". The withdrawal of trust is a powerful weapon – not just in the field of science, but also in the political arena.

GMO Safety: Specifically, what can scientists who work in the area of plant genetic engineering do to gain people's trust or to give themselves more weight in social debate?

Wolfgang van den Daele: There is nothing they can do.

GMO Safety: Is there no room for action?

Wolfgang van den Daele: They can gamble away trust – and they do that frequently by suppressing data, dressing up results or publicising claims too soon. It is very easy to lose trust, but very difficult to gain it. What do scientists want trust for anyway? People trust them that a technology works and can do something – but that is after all the only thing that they really know. And on other subjects, scientists are competing with people who sow mistrust, which puts them in a poor position. One of the reasons why the experts often have trouble asserting themselves in political disputes is because the experts argue among themselves.

GMO Safety: Even politicians working in this area are often unaware that there is a support programme for biological safety research. The results are not used sufficiently, if at all, in political decisions. How do you view the relationship between research and political decisions in an area as controversial as this one?

Wolfgang van den Daele: In fact, it is only the government agencies that have to decide on safety, not politicians. But the politicians observe the political scenery – and if there is a relevant conflict, they try to avoid it. We have seen this in Europe: Although it is in fact not legally possible, politicians agreed to boycott crop genetic engineering for some time. It would have been a different story if this style of policy had clear economic disadvantages.

The tendency to push something through against moods within the population depends on the perceived political and economic value of a technology. Seen in this way, crop genetic engineering is much less important in economic terms than e.g. nanotechnology. The problem is similar but I am curious to see whether politicians will be a bit authoritative here and authorise the technology, backing up their decision with science and safety research.

I agree that safety research into genetically modified plants is not perceived by politicians. You can see this in the fact that when it comes to legislation, the only issues that actually play a role are coexistence and liability. If you want to prevent crop genetic engineering, the safety argument won't take you any further. You can impose extensive conditions or prescribe monitoring by invoking the precautionary principle, but there are no scientifically based arguments for banning crop genetic engineering on safety grounds. The only area where there is room for manoeuvre in terms of legislation is that of coexistence, and this is being exploited.

Source: <http://www.gmo-safety.eu>, 2007

APPENDIX 4: THE MEDIA IN GERMANY

3) Media list

daily newspapers	N / R	RR	PCS
Frankfurter Rundschau	N	X	
Frankfurter Zeitung	N	X	
Weilheimer Tagblatt	R	X	
Aachener Nachrichten	R		X
Aachener Zeitung	R		X
Allgemeine Zeitung Mainz	R		X
Ärztezeitung	N		X
Bauernzeitung	N		X
Bayrische Rundschau	R		X
Bild	N		X
Braunschweiger Z	R		X
Coburger Tagblatt	R		X
Das Handelsblatt	N		X
Der neue Wiesentbote	R		X
Der Tagesspiegel	N		X
Die Rheinpfalz	R		X
Die Welt	N		X
Donaukurier	R		X
Deutsches Ärzteblatt	N		N
Financial Times Deutschland	N		X
Frankenpost	R		X
Frankfurter NP	R		X
Fuldaer Zeitung	R		X
Gießener Anzeiger	R		X
Göttinger Tageblatt	R		X
Hamburger Abendblatt	R		X
Handelsblatt	N		X
Karlsruher Anzeiger	R		X
Kieler Nachrichten	R		X
Kölner Stadtanzeiger	R		X
Kölnische Rundschau	R		X
Landeszeitung Lüneburg	R		X
Lausitzer Rundschau	R		X
Leipziger Volkszeitung	R		X
Lübecker Nachrichten	R		X
Mannheimer Morgen	R		X
Märkische Allgemeine	R		X
Märkische Oderzeitung	R		X
Merkur	R		X
Mitteldeutsche Zeitung	R		X
Naumburger Tagblatt	R		X
Neue Osnabrücker Zeitung	R		X
Neues Deutschland	R		X
Neuss Grevenbroicher Zeitung	R		X
Nürnberger Zeitung	R		X
Oberbayrisches Volksblatt	R		X
Ostsee Zeitung	R		X

Passauer Neue Presse	R		X
Pfaffenhofener Kurier	R		X
Potsdamer Neue Nachrichten	R		X
Rhein Zeitung	R		X
Rheinische Post	R		X
Rheinischer Merkur	N		X
Rhein-Neckar Zeitung	R		X
Salzgitter Zeitung	R		X
Schweriner Volkszeitung	R		X
Segeberger Zeitung	R		X
Stuttgarter Nachrichten	R		X
Stuttgarter Zeitung	R		X
Sueddeutsche Zeitung	N		X
Tagblatt	R		X
Tages-Anzeiger	R		X
Tagesspiegel	N		X
Tageszeitung Karlsruhe	R		X
TAZ	N		X
Thüringer Allgemeine	R		X
Torgauer Zeitung	R		X
Uetersener Nachrichten	R		X
Volksstimme Magdeburg	R		X
Waldeckische Landeszeitung	R		X
WAZ	R		X
Westfalenpost	R		X
Westfälischer Anzeiger	R		X
Wirtschaftwoche	N		X
Wolfsburger Nachrichten	R		X
magazines			
Brigitte	N	X	
Der Spiegel	N		X
Der Stern	N	X	
Die Zeit	N		X
Focus	N		X
Glaube aktuell	N		X
Jetzt (Beilage Süddeutsche)	N		X
Manager Magazin	N		X
Ökotest	N		X
TV/radio broadcasting			
Bayrischer Rundfunk (Radio/TV)	R		X
Deutschlandfunk	N		X
Deutsche Welle	N		X
Hessischer Rundfunk (Radio/TV)	R		X
Mitteldeutscher Rundfunk (Radio/ZV)	R		X
RBB (TV)	R		X
SWR (Radio/TV)	R		X
ARD Tagesschau (TV)	N		X
ZDF Heute (TV)	N		X
SAT 1 (TV)	N		X
NV 24 (TV)	N		X

Abbreviations:

N: nationwide

R: regional

RR: regular reading

PCS: press clipping service

Chapter 10

GREECE

George Sakellaris

Political landscape

Greece has been a parliamentary democracy following the political reform and the collapse of the military dictatorship (1967-1974). Because of its important geographical position, the country was implicated in almost all big international conflicts of the century. Today, Greece is a member of all important International Organizations (United Nations, UNESCO etc). Greece is a founder country of the Council of Europe, since 1961 member of NATO, and since 1981 member of the European Union.

Economy

Per capita GDP is \$ 23,155 (2007); real GDP growth is 1.2 % (2007); registered unemployment 10.2% (Dec 2006), but the unemployment among young (under 27) is 28.7%; Consumer Price Index 4.4% (Feb. 2007); current account deficit is € 32.26 bln., representing the 14.1% of GDP (2007). Invisible receipts, originating mainly from tourism, shipping (Greek registered and Greek owned ships constitute the largest merchant fleet in the world), and migrant workers' remittances offset to a great extent the balance of trade deficit. The national currency is the Euro since 2002. EC countries absorb nearly 64.3% of Greek exports while Greek imports from EC represent 64.4% of total imports (2006).

Political parties

With only one exemption since 1974 (June-September 1989), the Greek government has been composed exclusively of deputies belonging to the party having the majority in the chamber of deputies. The political parties in Greece are popular, disciplined and well organised. Among them two main parties (the conservative party *Nea Demokratia* and the social-democratic party *PASOK*) represent more than 85% of the total voters. The Greek parliament also has representatives of the Communist Party, *Synaspismos*, a small party of the left, and the Popular Orthodox Rally (LAOS), an extreme right-wing party.

- *Nea Demokratia* is the actual party in the government. Founded at 1974, it was also the governing party from 1974 to 1981. It is considered as the conservative party in Greece. The research policy of this party in terms of national investment and opportunities is characterised by hesitation and low priority. The party is very sensitive to public opinion versus new technologies, especially regarding GM-technology;
- *PASOK* is the socialist party and the main party of the opposition. The party was founded by Andreas Papandreou at 1974 immediately after the collapse of the military dictatorship in Greece. To this party belong the middle class citizens and is characterised by a populist profile adopted from his founder. Its policy versus technologies is very similar to that of *Nea Demokratia*;
- The *Communist Party* represents the 6% of the votes with ten deputies in the parliament. It is regarded as among the most “orthodox” parties supporting the Soviet model;

- *Synaspismos* is a small part of the left, formerly part of the Communist Party but actually adopting more liberal positions. Supporters of *Synaspismos* are belonging to the country's intelligentsia, with highly developed "ecological sensitivities" and a very critical position versus biotechnology;
- *LAOS* is a new populist party catering for voters with nationalistic feelings, supporting racism and pursuing an extreme right policy. It is opportunistic and has no policies regarding new technologies.

Law making

The legislative role belongs to the Chamber of Deputies. Almost all laws are based on initiatives of the government. Project-laws are sent by the executive power (ministries) to the chamber and generally (with few exemptions) are adopted and voted by that body. A simple majority (50% +1) of the votes cast is sufficient for the adoption of any law. For this reason the governmental role in regulation and diffusion in science and technology is very important. In Greece all laws are constitutional. Directives concerning their interpretation are issued by the ministries. The administration of justice is exercised through an independent judiciary and a system of civil, criminal, and administrative courts. The Supreme Court hears appeals from the decisions of lower courts. The constitutional court determines whether a law is constitutional in case of conflicting decisions between other courts or administrative organs.

The Ministry of Environment has the responsibility in Greece for legislation concerning biotechnology. In this case the law is introduced to the parliament by an initiator after examination by a body of specialists (legalisation procedure). The voting criteria in the parliament are political rather than social, ecological, technical or scientific; the political realities of the coalition influence political decision-making. It is very common to have contradictory laws in Greece. Two further ministries involved in biotechnology legislation are Agricultural Economy and Food, and Development to which the national Food Authority belongs. Hitherto, the Greek authorities seem uncomfortable when legislating on biotechnological matters. EU directives and legislation always take a considerable time before being adopted and integrated into Greek legislation (the average integration time is four years).

Environment, consumer policy and food safety (1, 2)

State institutions in Greece are more concerned with political than social issues.

- Greece does not have a clearly defined environmental policy. As in many other areas of the political life of the country, environmental policy is developed when the need arises according to various political and economical interests. Greek citizens themselves tend to lack "environmental conscience and discipline", and public pressure with respect to environmental matters is not significant;
- 2003 saw the creation of the National Consumer Institute for the protection of consumers' interests, attached to the Ministry of Development. The creation of this office helped to the development of consumer discipline and awareness about setting standards and priorities. However, there is a lack of independent scientific advice, with the main advisory role is given to the consumer organizations and initiatives;
- the National Food Safety Authority (EFET) was also established in 2003. Surprisingly,

this authority reports to the Ministry of Development and not to the Ministry of Food. Another peculiarity is that the Food Authority is under the supervision of the National Consumers' Institute and therefore often acts as an NGO rather than a scientific body.

Role of scientific advice in the governmental decisions

The impact of the various advisory committees on Greek decision-making centres is disproportional to the large number of these committees. The general feeling is that the committees are formed mainly to satisfy legislative needs rather than to play any real advisory role. These committees are formed as the need arises and are composed of experts rarely having a broad view of the topic they are examining. Two kind of advisory committees exist in Greece:

- the permanent scientific committee of the parliament, composed mostly of lawyers, is responsible for reconciling new legislation with the existing the Greek constitution and avoiding contradictory rulings. The members of this committee are not themselves experienced experts in matters scientific and rarely seek the help of those who are;
- the *ad hoc* committees formed for a limited period and having the responsibility of providing expert opinion on various subjects (prioritisation of state research biotechnology programs, evaluation of submitted proposals, judgment of social or health impact of various applications, etc.).

NGOs

Playing a significantly smaller role in society compared with some other European countries, NGOs have been growing stronger in Greece. They are form the backbone of the opposition to both agricultural and industrial applications of biotechnology. Their activities are characterised by an “activist” practice which makes them very popular for the mass media because of the opportunities they provide for stories and pictures. NGOs have considerable influence among the Greek intelligentsia as well for parties and individuals leaning to the left. Since the Greek parliament has not produced legislation on biotechnology, the NGO's activity is focused not on the government decisions but on large scale biotechnological applications (cultivation of transgenic tomatoes, use of transgenic soya as a source of lecithin by the chocolate industry, etc). The leader among Greek NGOs is Greenpeace; their target has always been consumer emotions and fears easy to manipulate, especially with respect to the food sector. The consequence is considerable influence with the general public.

A one-time leader of Greenpeace became the vice Minister of Environment in a former PASOK government while in 2008 Greenpeace was contracted by the Ministry of Agriculture as the main consultant for Ministry in Environmental issues. A consequence of this situation was that the draft law on coexistence drawn up by a committee of scientific experts went for approval to Greenpeace.

Several other activist NGOs have developed in recent years but, compared with Greenpeace, their limited backgrounds in science and equally limited communication skills means that they remain insignificant contributors to the Greek anti-GM movement. NGOs have lately become less negative and aggressive, now discussing alternatives and possibilities arising from organic farming.

Consumer associations increasingly support and promote the organic farming, participating in every possible debate and public discussion around the country. They are very insistent on legal aspects or gene technology, particularly traceability and labelling.

Research policy on biotechnology

For several reasons, biotechnology in Greece is a sector of “limited dimensions”:

- limited research areas of national interest because of a lack of national grants for biotechnological research results in researchers gravitating to international research networks rather than to projects of national importance;
- limited application possibilities. In Greece the “biotechnology industry” in the sense of technology innovation does not exist. Some food and pharmaceutical companies use imported methodologies, not having any economic motivation to generate their own. For this reason, industrial R&D departments are very small while the links between the industry and the universities are limited;
- limited market. The Greek population is only 10 mln and the neighbouring countries are relatively poor, traditionally with low investment in modern technologies. By contrast, biotechnology businesses globally focus on large and rich markets with strong industrial bases in which technology transfer is possible. So Greek R&D not only has to compete with more developed countries but also has the disadvantage of geographical isolation.

For these reasons biotechnology in Greece is built on rather an academic basis, concentrating on research rather than on production and confined to a small number of universities and research institutes. The investment in biotechnological research is low: only 0.15% of the national budget is devoted to research, and of that only 20% goes to biotechnology). This is five times lower than the European average.

Relevant government policies

Greece has not yet adopted national legislation for coexistence. While the Greek government has implemented the European regulation on coexistence and traceability, so far it has prohibited any cultivation of GM plants. Recently the co-responsible ministries of Agriculture and Environment have refused requests by the university for field trials; in the past such trials were vandalised.

The Ministry of Agricultural Economy and Food is the competent authority in Greece for the design and adoption of coexistence measures. It is assisted by other authorities as designated departments of the Ministry of Environment and the Ministry of Development. A committee of experts, appointed by the Ministry of Agriculture including representatives of government, academia and industry, operates under the chairmanship of the Vice-Minister with the aim of analysing coexistence issues and suggesting potential adaptation and adoption in Greece. The committee began work in spring 2006 and has not yet provided a concluding document; work remains in progress.

Field trials and commercial cultivation

In Greece there are no approved GM-plants for commercial cultivation or GM-field trials The

Ministry of Agriculture has rejected all applications even for experimental purposes

No decisions have yet been reached on separation distances, record keeping, cross border arrangements, etc.; these issues will be discussed and potentially adopted after the committee on coexistence publishes its conclusions. There are specific coexistence problems for Greece: thus, cultivation areas are small in comparison with other countries making potential “neutral zones” impracticable. Liability, compensation, penalties, enforcement and monitoring all still need to be agreed, again waiting for the committee of experts to publish their findings.

In the past, before the EU moratorium, a limited number of GM events were authorised. (see attached Table 1) but none remain any longer valid.

General climate and actual situation

Commercial biotechnology has always been of minor importance in Greece; it is probably the only country in the EU without a single biotechnology company in the sense of new inventions. Multinationals are the leaders, imposing their own rules on the market. The state interest in terms of investment for research was also limited, with biotechnology research so far never exceeding 9% of public funding for research and development; it was and remains the lowest in Europe at only 0.5% of GNP. Food is the only industry in Greece having any contact with biotechnology but even in the larger companies (as in the dairy industry), the R&D departments are limited to simple activities. Nor does the Greek food industry have close relationships with universities and research units.

The impact of the biotechnology industry public perception is accordingly very limited. The Greek biotechnology industry in Greece absents itself from open debates and disputes, thus avoiding a *de facto* negative climate. As regards communication issues with the general public, they tend to align themselves with the academic and research communities.

Trade unions in Greece, organised by trade and activity, are strongly linked to political parties and adopt the political positions of governmental or the opposition. They exert a very strong political impact on the political life of the country, with considerable influence on government decision-making. But, in spite of that, they have never become involved and have no policies on worker protection or any other aspects of biotechnology.

Public perception

Public perception in Greece of biotechnological applications is very limited, showing the lowest acceptance and the highest risk concerns in Europe (3-5). This attitude is reflected in co-existence issues:

- the very negative climate prevalent among consumers and the strong influence of activist organizations influences politicians. Thus, political parties take no risks of adopting a policies counter to perceived public opinion and hence pursue a very conservative strategy on this topic;
- farmer associations are also very negative and sceptical: (a) the associations are politically guided and they adopt the parties’ policies; (b) Greek farmers have never had an opportunity of witnessing the reality of GM-farming;

- seed and biotechnology companies do, of course, support favourably the enactment of coexistence rules but their influence is limited due to the lack of trust by consumers and the role of the media (see pages 10-5 and 10-8);
- the attitudes of stakeholders and unions are interesting. The Union of Farmers has declared its total opposition to agricultural biotechnology and strongly supports organic farming. The Association of Supermarket owners have published a statement rejecting the stocking of GM-products in Greek supermarkets; none are available in Greek food stores;
- organic farming is not yet well organised but is gaining in popularity, with considerable support from the media. Organic products are available in all Greek supermarkets; the number of specialised organic shops is growing.

Public discussion and debates

Public debates on science and its applications are limited. Public opinion is formed mostly from television but Greek TV programmes seek to influence the public rather than inform them. Greeks are very spontaneous and enthusiastic people so that information about futuristic and unknown potentialities of new technologies can have a highly emotional impact on the public. There is a strong tendency to relate any cultural or scientific matter to a political background. Thus, the few public debates on biotechnology have major political emphases, in many cases more devoted to politics than to science.

One reason for the lack of involvement in the public dialogue might be the absence of a Greek biotechnology industry so that such applications have no direct effect on everyday life. Awareness has begun to develop in recent years as a result of activist initiatives although state bodies play no part in the public dialogue. Another important consideration is religion, a key factor in the public and personal lives of most people. The Greek Orthodox Church, in many ways very conservative, has adopted a neutral stance on biotechnology (6, 7).

Present national/local political positions

On at least two occasions, Greece has made use of a safeguard clause, based on article 3(10) of EU regulation 178/2002 on the protection of human health and the environment in order to ban GM-maize MON810 approved throughout the EU (29 March 2006), and of article 16 of European Directive 220/90 in the case of the oilseed rape (March 2005). In both cases the Greek dossier was assessed by a committee of experts of the EFSA and in both the Greek position was rejected. Nevertheless, in both cases the planting season was missed – which may have been the authorities' objective. Such actions illustrate the policy of the Greek government and public administration to avoid GMO-cultivation using the provisions of EU regulations (8).

The position of the retailers in Greece

The outcome of repeated efforts to approach Greek retailers and record their positions and policies on GM-food and labelling issues was their refusal to discuss the issues or to reply to the CONSUMERCHOICE questionnaire. The reasons, implied or stated explicitly by management or marketing representatives, was that it was not relevant to the current situation in the Greek market.

As reported by Greenpeace (autumn 2005), the official policy as stated both by individual food retailers as well as by their trade association is to exclude food and other GM-products from their stores.

Greenpeace Report

In May 2005, Greenpeace in Greece (9) published a report on genetically modified ingredients in the European market. It put forward the grounds for the rejection of GM-foods in most European countries, drawing on the politics of major retail companies and food industries.

The report discusses the Greek market in detail, with extensive information from 1997 onwards throughout the Greenpeace campaign against GM-food. It encompasses the policies and future plans of the 17 largest retail companies on GM-food trade as well as their opinions on labelling and traceability issues.

Some of the findings are as follows:

- 14 out of the 17 retailers who have responded, stated that they do have a policy against the use of GM-food in their stores: Basilopoulos (and its subsidiaries Trofo and Ena), Sklavenitis, Beropoulos, Masoutis (and Alfa Delta), Pente, Inka Chanion, Chalkidiatis, Balis, Galaxias, Andrikopoulos;
- the remaining three companies (Metro, Ilias Doukas Food Company, Lidl) either avoided giving a clear-cut answer or refused to answer, regarding themselves as not being liable for the composition of their products. However it should be noted that NO company reported GM-labelled food in its stores;
- this policy is expressed in many ways such as establishment of certification criteria from suppliers or the implementation of control processes for the certification of private labelling products;
- four companies (Sklavenitis, Beropoulos, Masoutis, Inka Chanion) stated that they definitely plan to continue the non-GM policy in the future;
- the Greek Association of Supermarkets (SESME) has stated: *“The Management Committee of SESME... is against the use of GMOs in the production of food and animal feed. However, food producers and the State are liable both for labelling issues and for the certification of food composition, while retail companies do not have the qualifications or any institutionalized operation for the control or the certification of products composition. Certainly, being based on their attested position against the use of GMOs in food production, retailers will not agree to merchandise private labelling products for which there is no certification of non-use of GMOs provided by producers.”*

In addition, based on its action *Safari against GM food*, which aims at identifying and registering GM-labelled products on supermarket shelves, Greenpeace (6) has reported that *“there are still no GM-labelled products found in Greek super markets”* (p. 24 of the report).

This information appears still to be valid; it is verified by most Greek retailers and it has been repeatedly circulated in the Greek press. It amply illustrates the general position scene of the Greek market and the generally negative attitude towards GM-food. Finally, it puts in context consideration of various forms of GM-free labelling (see below).

Products on sale labelled “contains GM” and/or “GM-free”

Greece was the first European country in which products with negative labelling appeared. The label was an accurate description based on analytical data and a marketing device to attract the attention of the consumers.

There is a strong movement supporting the creation of Greece as a GM-free zone within Europe. The ENAE (The Greek union of all 54 prefectures) has collected 54 independent petitions from all the geographical regions of Greece declaring those regions as GM-free zones. Such activity exerts considerable political pressure on the Greek government and public administration. There are local initiatives by citizens, supported by political parties, trade unions, NGOs and various stakeholders promoting the principle of Greece as a GM-free zone. Every year in Athens, the symposium of the social forum focuses mainly on GM and coexistence issues. The forum is supported by many political and social groups and has a major impact both on the local society and also in other regions of the Balkan Peninsula. Thus, the situation in Greece is one in which most key actors enjoy a consensus view any GM application in the food sector. The negative positions are supported by the whole of the media and all the stakeholders with the agreement generally of public opinion. Part of the rationale behind the policy is the expected benefits to Greek tourism, the main financial resource in the country (10).

Greece is the only European country to declare itself entirely a GM-free zone (Fig. 1).

Store surveys in Greece

All retail stores surveyed were supermarkets in and around Athens.

Three supermarkets were visited during the period winter-spring 2006. Given the negative climate for GMOs in Greece, it was impossible to have any constructive dialogue with the supermarket managements except for their reassurances that there were no GM-products whatsoever on the market.

All the supermarkets carried crop-based products labelled “GM-free” Produced by the Greek company “FYTRO” which adopted negative labelling in 1999.

There were no interviews with consumers.

The voices of the media

Items on gene technology and GM-food often appear in the Greek media and display a number of general characteristics:

- the issue is mostly covered by newspapers. Reports on television tend to be either anti-GM opinions or debates between of experts and non-experts with rather uncertain outcomes;
- the issue is totally absent from radio and magazines;
- there is usually emphasis on the high risks both to consumers' health and effects on the

environment;

- there is a complete absence of any mention of potential financial or other benefits;
- comparison is often made between “traditionally healthy Greek food” and GM-products;
- broad presentation of negative attitudes collected from public surveys;
- sometimes there is emphasis on the absence of related industry in Greece and the dependency of the national economy on multinational companies;
- in fewer cases published articles have raised ethical and social implications.

The coverage of GM-food in the Greek media was investigated through a time-series analysis of four newspapers for the period 1st July 2006 – 29th February 2008: *Kathimerini* (“Daily”), *Eleutherotypia* (“Free Press”), *Ta Nea* (“The News”) and *To Bima* (“The Tribune”). These newspapers are considered as opinion-leaders for the Greek public.

Kathimerini is a morning newspaper, nationally distributed and perceived politically as conservative although critical of right-wing parties. *Eleutherotypia* is an afternoon daily newspaper more towards the socialist left. *Ta Nea* is a national afternoon newspaper, currently with the highest circulation of all the afternoon papers in the country; it is oriented towards the middle of the political spectrum. Although tabloid in shape, its style and content are very different from British tabloids but it is not as strict and rigid as the average “quality” newspaper would be. *To Bima* is a morning newspaper, second in circulation after *Kathimerini*; the paper takes a central-left political view like the socialist party and the present government.

An earlier biotechnological media analysis was conducted in 1998 as part of the European research project LSES (Life Sciences in European Societies) and covering the media position of a large spectrum of biotechnology applications in health, pharmaceuticals, GM food and energy. That investigation was based on series analysis and covered the long period from 1974 to 1999. The whole analysis was divided into three phases:

- Phase 1974-1991 (Progress at the risk of opening Pandora’s box)
- Phase 1992-1996 (More progress and benefits at the expenses of the morality)
- Phase 1997-1999 (Progress versus public acceptability).

It was only in this last phase that the GM-food issue started to appear. In this phase coverage grew rapidly, partly because the biotechnology debate livened up in many arenas of the public sphere and also due to the insistence of the Greek press. By 1999, GM-food had become the predominant biotechnology press topic. Although starting as an informative discussion of risk and benefits, the phase ended with purely negative views of GM-technology expressed by the whole of the press. Such topics as economics or regulation as related to GMOs were presented negatively. Emphasis was given to public protests about GMOs and the demands that were made for its exclusion from Greece. The actors most frequently mentioned as involved in Phase 3, were special interest groups, especially Greenpeace. The strong position adopted by these groups was against both the release and scientific investment into the production of such organisms and consumer products.

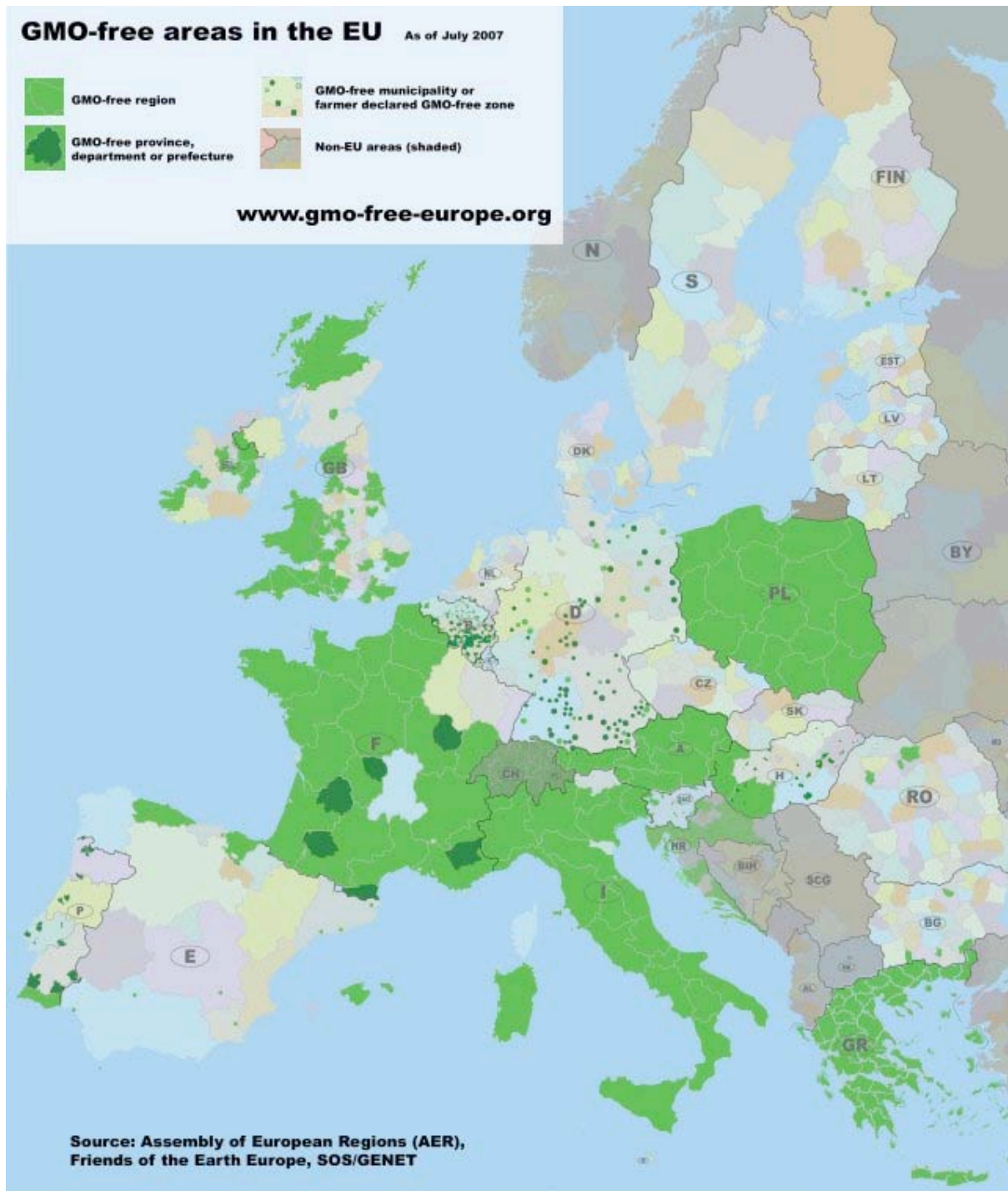


Fig. 1. GM free zones in Europe (11)

This media analysis undertaken in the CONSUMERCHOICE project shows virtually no change since Phase 3 of that earlier study. A total of 128 relevant items were published in the four major newspapers noted above. Virtually nothing of interest was published in magazines and other media outlets,

The frequency of the articles during the 20 months of the survey is shown in Fig. 2:

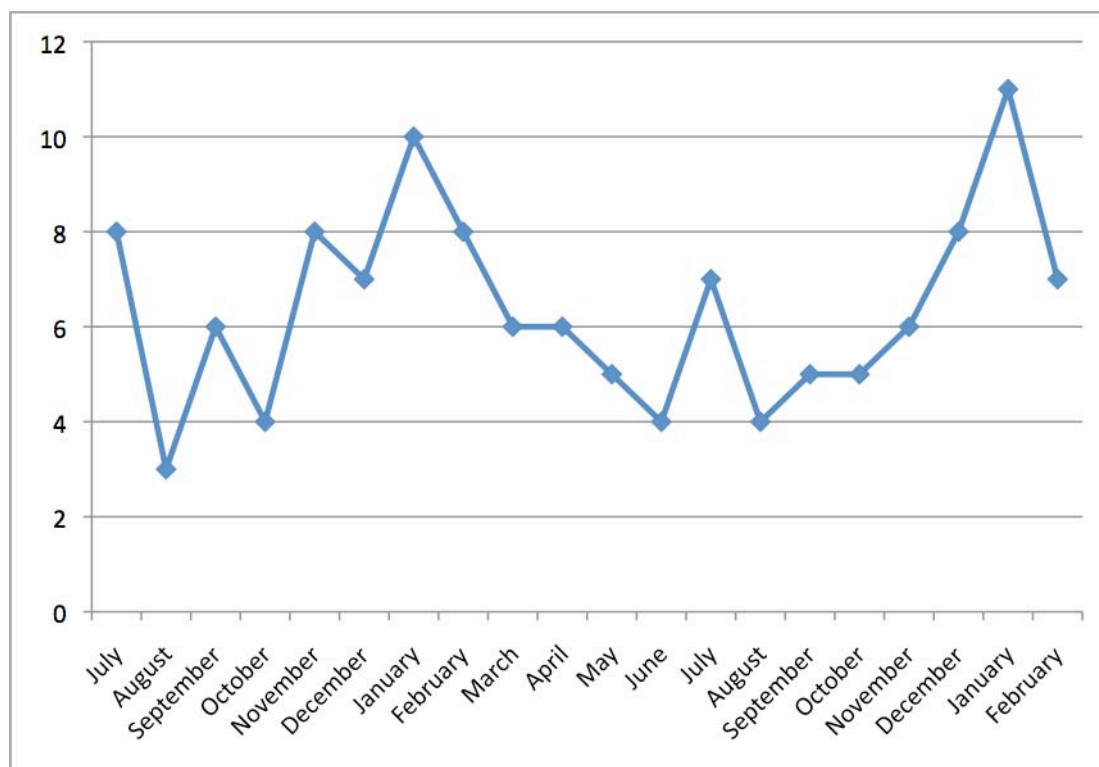


Fig 2. Frequency of the articles related to the GM food on the Greek Press from July 2006 to February 2008

The small number of articles makes the statistical representation of the frequency irrelevant; we note only a low frequency during summer (particularly in August).

Nor are we able to correlate the frequency of the articles with specific political or social activities. Activities in this area are often not reported because of the low level of public interest. Even when the cultivation of MON810 was banned in March 2007, the frequency of published items did not change, while events like EFSA approvals, EU Commission decisions on risk assessment and those of the EU Ministers of Agriculture simply failed to appear in the media.

It is also worth noting to note that more than 25 articles out of the 128 were translations from the foreign press, the majority dealing with banning decisions by foreign governments, risk and harm data, and public surveys. Most of the articles covered international issues with very little focus in Greece; few articles had a local character, understandable because there is no GM-food on the Greek market.

Articles about the relevant science often focused on claims of unintended effects, harmful to the consumer and the environment, resulting from the consumption of GM-food. There have been reports of statistical analyses, risk assessment data and undesirable perspectives.

Articles of social nature mostly promote negative social implications and concerns. Those dealing with regulatory issues and economic aspects are the most balanced and sometimes even positively disposed towards gene technology.

Press items fall into the categories noted in Table 1:

Table 1. Categorization of articles related to GM-food in the Greek press from July 2006 to February 2008

category	total number	percentage
local	4	3%
national	38	30%
international	86	67%
category	total number	percentage
debate	13	10%
consumer	27	21%
science & technology	31	24%
economy	15	12%
health	26	20%
environment	14	11%
other	2	2%

Table 2 shows that most media items take a negative view of GM-foods.

Table 2. Evaluation of articles related to the GM-food in the Greek press from July 2006 to February 2008, as positive, negative and neutral

category	total number	percentage
positive	8	6%
negative	109	86%
neutral	11	8%

It is interesting to explore how the concept of the risk/benefit is handled. Table 3 shows a more in depth analysis of articles *Kathimerini*:

Table 3. Risks and benefits of GM-foods as described by *Kathimerini*

Theme	Risk Only	Benefit Only	Risk and Benefit
GM Food	8		2
Economy	3	2	4
Regulation	4	2	3
Health	3		1

Focus groups

A study was undertaken of current public attitudes via focus groups, aiming to explore both people's attitudes towards GMO when choosing products in the store as well as the influence of NGOs on people's view on products containing or derived from GMOs.

Six such groups, each comprising 6-7 people, were organised in the early months of 2008; detailed findings are given in Appendix 1 (page 10-15). In summary, it was clear that the focus group members reflected current Greek opinion and were hostile to gene technology as applied to food and agriculture. The younger and better educated participants were more tolerant but overall GM-foods were seen as possibly having value for the poor of the developing world but not at home in Greece.

Conclusions

Although it is not official, Greece is in practice a GMO-free country. In addition to the official ban on any GMO cultivation, the supermarkets collectively have decided to avoid the provision of any GM-product in the Greek supermarkets, even as a minor ingredient such as GM-lecithin in chocolate. Public opinion is certainly against GMO technology in the food domain and this opinion is supported and guided by all of the Greek media. Anti-GMO NGOs are popular and highly trusted by the generality of consumers. In these circumstances, political parties and politicians decline any risk of going against an essentially unanimous public opinion. Add to that a total absence of any direct national interest in GM technology as there is no relevant industry, and the picture becomes one of a country simply wishing to have no part however much it may develop elsewhere. Such public and political attitudes have several times brought Greece into conflict with EU regulations and regulatory bodies (12). It remains to be seen how this interaction will play out in the years to come and how public opinion in Greece will react if there were a shift towards GM-foods and products in other, and particularly major, Member States.

References

1. Hatzouli A. & Sakellaris G. (2001) "Losing faith in Biotechnology" in *"Biotechnology: The years of controversy"* p.p. 204-214 ed. Science Museum
2. Stathopoulou A., Hatzouli A. & Sakellaris G. (1999) "Biotechnology: Policy, Media and public opinion in Greece" in *"Biotechnology in the public sphere"* p.p. 77-88 ed. Science Museum London
3. Cheveigné, B. Fjaestad, J.M. Gutteling, J. Hampel, E. Jelsøe, J.C. Jesuino, M. Kohring, N. Kronberger, C. Midden, T.H. Nielsen, A. Przystalski, T. Rusanen, G. Sakellaris, H. Torgersen, T. Twardowski and W. Wagner. (2000) "Biotechnology and the European public" *"Nature Biotechnology 18(9) 935-938"*
4. Gaskell G., Bauer M. & Durant J. (1999) "Biotechnology in the Public sphere" p.p. 1-18 ed. Science Museum London
5. Batrinou A. Sakellaris G. Spiliotis V. "Acceptability of Genetically Modified Maize by Young People" *British Food Journal*. volume 110 issue 3
6. Alansdotir A., Sakellaris G., Galloux J.C. & Mortensen A. Cheveigne S. (2002) "The Institutions of Bioethics" in *"Biotechnology the making of a global controversy"* p.p. 129 – 149 ed. Cambridge University Press
7. Helge Torgersen, John Durant, Edna Einsiedel, Björn Fjaestad George Gaskell, Petra Grabner, Jürgen Hampel, Erling Jelse, Jesper Lassen Torben Nielsen, Timo Rusanen, Georges Sakellaris (2000) "Promise, problems and proxies: 25 years of Biotechnology debate and regulation in *"Biotechnology the making of a global controversy"* p. 21–94 ed. Cambridge University Press
8. Stamatis Sekliziotis, & Ann Murphy GAIN (Global Agricultural Information Network) Report: GR5021: "Greece Biotechnology 2005 – USDA" (2005)
9. <http://www.greenpeace.gr>

10. Paul Pechan, George Sakellaris & Ann-Katrin Bock (2005) "Public perception and communication in Biotechnology" " in Genes on the menu – Facts for knowledge based decisions" p.p. 135 -156 Ed. Springer
11. GMO-free regions. GMO-free Europe (August 2007) (<http://genet.iskra.net>)
12. Alansdotir A., Sakellaris G., Galloux J.C. & Mortensen A. (2003) "Ethics in Modern Biotechnology: Public concern and political issues" in "Biotechnology: The making of a Global controversy" p.p. 129-148 ed. Elsevier

APPENDIX 1: FOCUS GROUPS

As mentioned elsewhere in this chapter, there is in Greece no GM-food available in food stores. However the public is aware of the issue and of the fact of GM-food sales in other European countries. It was in this framework that public opinions and attitudes on this issue were explored via focus groups in a totally “non-GM food” country.

The study aimed to explore:

- (a) people’s attitudes towards GMOs when purchasing food products; and
- (b) the influence of NGOs on people’s view of products containing GMOs.

Six focus groups were held between January and March 2008, all in Greek and all recorded. Each group comprised of 6-7 participants, mixed by gender and internally homogenous with regard to age and level of education. Before the start of each group discussion, participants were asked about their knowledge and understanding of the issue in order to avoid one or a few participants dominating the discussion. In one case a participant was indeed very knowledgeable about the issue and had also been a member of an NGO with a clear anti-GMO position; he was therefore excluded from further discussion.

The questions were divided in the following sets:

- knowledge and awareness of GMO issues;
- impact of that knowledge – awareness of opinions and attitudes.
- impact of opinions and attitudes on the consumer’s choice and behaviour.

Tools, including newspaper articles, leaflets, magazine articles, internet pages and scientific opinions, were used during the discussions.

The composition of the groups was as follows:

average age	number	male/female	educational level
23	7	4 / 3	university
34	6	2 / 5	university - PhD
44	7	5 / 2	high, technical school
50+	7	3 / 4	high, technical school
26	7	3 / 4	high, technical school

Participants were chosen randomly from a “participants list” provided to us by the opinion survey company Kappa Research. Apart from the people in each group being of approximately similar age and educational background, no other proximities (political position, religious beliefs, profession location etc) were considered.

Precaution was taken to ensure that the intervention of the moderator was minimal and that participants were able to develop their own opinions and be involved in an active dialogue.

Analysis

In addition to the content analysis, we conducted an analysis of analogies, a communicative resource frequently used in the discussions. By identifying and analysing analogies, conclusions could be drawn about how the phenomenon of GM food was understood and explained in the groups. Conclusions were also drawn by using analogies about how the issue was argued and compared phenomena experienced earlier.

Analysis of the focus group discussions was structured around the following themes:

- risks and benefits of gene technology;
- information, trust and opinion of existing institutions plus opinions about a regulatory framework;
- participants' willingness to buy GM-products
- views about Greece as a GM-free country.

Risks and benefits of gene technology

All groups clearly had difficulties understanding the meaning of risk. Almost all participants perceived risk as a definite harm caused by the new technology. The risk concerns were focussed on consumer health, environmental consequences, changing of nutritional attitudes, economic dependence on multinationals and eating styles including over-consumption of fast food.

There were differences in risk perception between the more and less educated participants and also between the different age groups:

- educated participants tended to perceive risk in a more rational way while the approach of the less educated was rather emotional. The emotional approach was most marked in older people, with the younger more rational;
- younger and educated people tended to perceive risk in quantitative terms; older and less educated people had a more qualitative approach;
- risk vs. benefit analysis was well perceived by almost all the participants. However, young and educated people showed a higher risk tolerance in order to gain potential benefits with older and less well educated people hesitant and risk averse;.
- none of the groups was able by themselves to see obvious benefits of GM technology in food. Almost all agreed that the technology in food had a primary objective of increasing yields and solving food supply problems in developing countries. Thus they could see no obvious reasons why it might be applicable in places where people were not starving, "especially in Greece which has the healthiest nutritional practices of anywhere in the world" (true or not, this was said in three of the groups!)
- there were difficulties in distinguishing risk assessment from risk management. People unanimously agreed that risk assessors must also be the risk managers while the opinion

in other European countries is just the reverse: assessing and managing should be separate roles.

Unavoidably, all groups wished to discuss management issues. Some very interesting opinions were expressed:

- on finances (extra taxation for GM-food);
- some people felt that coexistence is impossible in practice;
- on liability (companies and GMO farmers must pay for any potential damage);
- on legislation – stricter liability laws;
- on the coexistence issue, people were unable to accept coexistence as an economic matter, perceiving it only as a safety issue;
- people all the groups were more flexible about risk with respect to biotechnology applications other than GM-food – health was especially prominent as an area where gene technology caused minimal concern;
- when potential benefits were taken in consideration, four of the five groups agreed that the potential harm is definitely higher so that the risk for an uncertain benefit is not worth having GM technology in food;
- finally, an opinion voiced by the two more educated groups was the GM technology is a technology “imposed” by multinational companies which is in fact not needed in our society. They were complaints about the weak position of the European Commission. Everyone supported the Greek determination not to have GM-food.

Information, trust and opinion on existing institutions, as well as opinion on the regulatory framework

- half the participants agreed that information is very important and it is therefore essential for consumers to be informed and aware. The other half (especially the less well educated and older people) thought that information could be optional since GM-food is not an issue for Greece nor will it be in future;
- all participants agreed that information about undesirable consequences resulting from the use of GM-food must be promoted and widely distributed to alert consumers and enable them to defend themselves against the new technology;
- some participants accused the scientific community of promoting one side only of the argument. They agreed this makes scientists lose credibility;
- continuing the same topic, one of the participants raised the issue of withdrawing biology books in high school which, he/she said, “poison innocent young spirits with harmful applications”: that participant felt that because childrens’ judgement is weak, they would be subject to undue influence to accept pernicious concepts. Incidentally, this issue was also raised in the parliament in February 2008 by the coalition of left parties, asking the Ministry of Education to revise biology books in high schools even though those books had been written and approved by academics appointed by that very same ministry;
- most participants declared themselves as more or less knowledgeable about GM-food. However most of them admitted that their main source of information was television and the mass media in general. They also agreed they would prefer to watch sports or an

entertaining programme rather than an informational panel discussion.

- to many of the participants information was also related to the institutionalising of GM-food assessment and safety in Europe. Only five people knew about the existence of EFSA (European Food Safety Authority) and all first heard about it when Commissioner Dimas (frequently mentioned by the Greek media) accused EFSA of a lack of transparency;
- few of the participants (25%) knew about the existence of the Greek Food Authority and none of knew any of the details: its legislative role, structure, affiliated bodies, actions etc);
- again with reference to trust issue, almost all participants had limited trust in the EU on food matters. In their view the Commission helps the interests of the multinationals and that they prefer to trust the Greek government and political parties, all of which having a solid position against GMOs;
- none of the participants had any specific knowledge on regulation, labelling, traceability, coexistence, etc. However, in three of the groups participants raised the issue of common European legislation. After the discussion they all strongly disagreed with it, saying that any country should have the unconditional right to be a GM-free zone;
- although participants do trust the Greek national authorities and the regulations they enact, they do not trust the “purity” of the products in supermarkets. One participant said that companies fail to label their products when exported to countries like Greece where GM is not wanted. A similar accusation was made by Greenpeace in Greece some months ago and a list of the suspect companies was given to the media.

Willingness to buy GM products

This was essentially a non-issue since none of the participants expressed any such intention. In a facetious mood one participant said *“I would try them if they were tasted different, but since there are no differences there is no sense in trying”*

Some of the participants said that GM-products *“must be tailored for the markets of developing countries since their only visible utility is to help the hunger problems of those countries”*.

They all agreed that surveillance for accidental contamination should be reinforced in Greece.

Greece a GM-free country in Europe

The scenario of promoting Greece as a GM-free country within Europe is growing and has more and more supporters. As discussed earlier in this chapter (see page 10-9), there are two grounds for this view:

- Greece has no biotechnology-related companies and so no obvious economic interest in the technology. Moreover, cultivated land in Greece is very fragmented and hence regarded as inappropriate for large-scale cultivation or for any kind of coexistence with GM-agriculture;
- the main industry of the country is tourism. A campaign for healthy food might be beneficial, making the country a more popular destination

These arguments were more or less known by the participants so a discussion ensued on this particular topic in a consensus climate. The moderator tried to point out that, except for the GM refusal, eating habits in modern Greece are not very healthy, with a high consumption of fast food, the highest percentage of fast food in Europe, etc. Participants agreed but one said that *“this might be reversible while GM effects are still unknown and maybe irreversible”*

Summary

The majority in our focus groups were negatively disposed against GM-food. Despite the minor differences in their opinions, they were determined to keep them out of Greek supermarkets.

Young and educated people seem to be more tolerant to risk issues but they are also better versed in their arguments against GM technology.

Trust appears to be a serious issue; the GM issue is one of the very few for which local institutions are more highly regarded than those of the European Union.

For most people GM technology in food may be appropriate only for resolving problems of hunger in the developing world.

Chapter 11

THE NETHERLANDS

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Patricia Osseweijer

Introduction

Towards the end of the 1990s, when several food-related incidents such as BSE and bacterial contaminations were covered in the media, people became more critical towards their food and of the existing food safety regulations. This critical attitude was enhanced by public debates on biotechnology and genetic modification (GM). These debates eventually led to more negative attitudes amongst the public towards the technique and its applications (1). The Dutch people were asked for their opinion about GM food during and after this period (2), specifically during the national GM debate on food *Eten en Genen* (Food and Genes) in 2000. In most surveys they were asked to reply to hypothetical scenarios.

One of the largest and most well known surveys that collect opinions is the EC Eurobarometer (3). In the latest survey in 2005, 73% of the Europeans stated that they did not support GM-food. For the Netherlands the level of support for GM-food (i.e. participants answering “agree” and “totally agree”) was just below the EU average, with only 25% definitely offering support. According to the Eurobarometer (4), Dutch support of GM-food declined over the succeeding years. Despite these attitudes, the Eurobarometer suggests the Netherlands is one of the few countries with the lowest percentage of non-buyers (people who *say* they do not want to buy GM-food). This was based on the finding that they do not reject all the possible reasons for buying GM-food. However it was not known whether the people who are considered by the Eurobarometer to be purchasers do indeed buy GM-food.

European optimism on biotechnology was very low in 2002 (3). Driven by pressure from NGOs and consumer organisations for freedom of choice in buying GM-food, the European Commission (EC) decided to introduce labelling regulations: Regulations (EC) 1829/2003 and 1830/2003 came into force on 18 April 2004 to facilitate consumer choice. They required that all GM-containing products are labelled as “genetically modified” or “produced from genetically modified [name of the ingredient]”⁽⁴⁾. At the end of the 1990s, in reaction to media attention and perceptions of people’s attitudes, and in anticipation of the public reaction to labelled products, retailers and food producers altered the ingredients of many of their products to avoid any GM-content.

All the GM-containing products at present on the market are labelled. It is therefore now possible to determine the actual choices consumers make in their daily shopping. Do they behave as they said they would in surveys like the Eurobarometer, or do they not? This study compares actual consumer behaviour towards GM-labelled products with purchasing intentions expressed in response to opinion polls and questionnaires.

By looking at what has happened around GM and food in the past together, with a closer look to what has happened in Dutch politics and published media during the course of the project, the study begins with an overview of the contemporary culture in which consumers make their

shopping decisions. The actual GM-products available in Dutch stores were surveyed in order to evaluate the opportunities for consumers to buy GM-labelled products. In addition to a quantitative study of people's behaviour and attitudes towards GM-labelled foodstuffs, discussed in Chapter 6, a series of focus groups were held to gather more qualitative information on consumers' attitudes and shopping behaviour with respect to labelled GM-products.

The GM debate in historical aspect

There has been a long political and social debate on genetic modification in The Netherlands. It began in 1981 when recombinant DNA research and technology were discussed extensively. The first food-related biotechnology product to be discussed in the country was the growth hormone, bovine somatotropin (BST) that was already being used to increase milk production of cows in the US. In 1987 the Dutch Ministry of Agriculture issued a consumer opinion study on BST and in 1988 the possible introduction onto the Dutch market was discussed in Parliament. There was public concern that the use of BST in cows would be found in the milk. As a result, BST was never allowed in the Dutch market.

In Parliament, discussions about the usefulness and the risks of biotechnology continued. Around 1989, the debate extended outside Parliament. One of the two topics of this early debate was cheese production using GM-enzymes (chymosin) replacing rennet from calves; this was approved in 1989. Most GM-chymosin is produced by a Dutch company in France from where it is sold to many other companies worldwide. Dutch dairy producers refuse to use it in their production process (5), possibly because of it posing a threat to their image (6) and to their major export market (notably Germany). This is in contrast to the United Kingdom where GM-chymosin is used to produce vegetarian cheese and later to avoid BSE contamination.

The second issue arose after the birth of the transgenic bull "Herman" (1990) designed by the pharmaceutical company "Pharming". The bull was created with the aim of breeding cows that produce lactoferrin in their milk. It raised questions and problems about the purpose and use of GM techniques, leading to debates in Parliament as well as in newspapers. During this period, issues raised by genetic modification were increasingly discussed together with demand for more public information on GM topics. The government organised various workshops and debates on biotechnology subjects. It also subsidised the Consumer & Biotechnology Foundation, whose main goals were to providing an independent knowledge-based information source and to take the role of debating partner. A Government-funded public information campaign was started in the early 1990s led by PWT (Foundation on Science Communication); it ended in 1998.

In 1996 GM-soya entered the European market: in April 1997 the Ministry of Health issued a labelling directive on the use of GM-soya and -maize in products within the framework of the food law. However, in October 1997, the court decided that the food law could not be used to differentiate between products and the decree was rendered invalid. This did not imply any real changes because, from November 1997 onwards, the labelling of GM-soya was required by European regulations (7). In addition, Dutch NGOs (including Biologica) were becoming more critical of GM-food and of governmental policy in this area.

In 2000, the government therefore decided to organise a public debate on gene technology in food. An interdepartmental report was published in 2000 and, based on this, in 2001 a national

public debate about GM food called *Eten en Genen* (“Food and genes”) was organised (2). It aimed to exchange and increase the level of information on biotechnology and food among as many people as possible, and to identify the conditions under which food biotechnology is acceptable for society. Critiques indicated that in effect it missed in its aims because the debate started with the wrong questions and was not properly organised and presented in the media (8, 9). *Anno 2006 coexistence* was the topic of debate, not so much in Parliament as between different NGOs, universities, research centres and biotechnology companies.

In May 2006, the Ministry of Environment approved several field experiments with GM-maize in the central region of The Netherlands which were then destroyed by Greenpeace. As noted above, Government prescribes and checks the rules concerning biotechnology, leaving it to other parties to act. Nowadays agricultural organisations together with plant breeders and consumer organisations have agreed on guidelines for growing GM-crops (10). The guidelines were designed to keep adventitious mixing of GM and conventional agricultural products to an absolute minimum, thereby guaranteeing coexistence and ensuring consumers’ freedom of choice.

At the end of April 2007 Greenpeace discovered that, under false notifications, unapproved varieties of rice and maize were imported into Europe via the harbour of Rotterdam. This gave rise to a discussion on the differences in regulations between the US and the EU, and how this should be resolved and by whom. The discovery also led to criticism of the Consumer Product Safety Authority, the public body responsible for the paper trail as well as for sample testing of containers entering The Netherlands and the rest of Europe via Rotterdam.

Political landscape

The Netherlands has a multi-party coalition system. The Cabinet of Ministers, consisting of a coalition of parties together constituting a majority in Parliament, sets policy for The Netherlands. The opposition comprises other parties not in the Cabinet; Parliament has a total of 150 members. In general The Netherlands is against the genetic modification of animals for fun and sport (11). Each party has its own opinion regarding GM-plants and microorganisms and the application of the precautionary approach, ranging from a “yes, unless” policy to “unacceptable until proven absolutely safe”. Within government, seven ministries deal with biotechnology-related issues (12). The Ministry of Health is the most important concerning food labelling. One of its aims is that products containing GMOs are safe and clearly labelled so that consumers can choose whether or not to buy them. The competent authority in The Netherlands concerning the safety of GM-products is the Consumer Product Safety Authority under the of the Ministry of Agriculture. They are responsible for product and crop testing.

Since 2000, the Dutch Integral Document on Biotechnology (16) has prescribed guidelines for the government on how to handle issues concerning biotechnology, including GM-food and -organisms. The government takes a rather favourable position toward modern biotechnology in line with the “yes, unless” policy; it is willing to support and finance potentially beneficial applications and research but at the same time it considers the possible risks. Laws, regulations and policies regarding all aspects of modern biotechnology and its applications are mainly defined by international treaties, EU guidelines and regulations. The Dutch government’s role is only to implement and maintain these guidelines and regulations for those who handle biotechnology or GMOs. Despite the interdepartmental report and the

government's position, the actions undertaken by the Dutch Government are modest with regard to the stimulation of biotechnological innovations. Governmental research centres were privatised and expenditures on R&D in The Netherlands are low compared with the surrounding countries. This relative lack of investment by industry may be due to an anticipation of a change of view by the Dutch government (6). To stimulate genomics research, The Netherlands Genomics Initiative (NGI) was established in 2001, initially funded by the Dutch government (14). Ministers are advised by a committee (COGEM) for the field releases of crops, other GMOs and related issues. The prolonged reluctance of one of the former Ministers of Housing, Spatial Planning and Environment (Minister Pronk, who is responsible for legislation on GM-crops) to allow field tests has influenced the general view of the public. At the present time, Minister Cramer, newly appointed to the position, takes a more favourable view of GM; this has resulted in a marked increase in the number of trials.

Further details are provided in Appendix 1 (page 11-16).

The present situation

Public opinion

During the course of the CONSUMERCHOICE project (July 2006 until February 2008), only one poll was held in The Netherlands that specifically addressed GM food. It was commissioned by RTL news and run by TNS/NIPO (15). The general findings were broadcast on national television and picked up by newspapers. Despite the large coverage by many newspapers and the different types of media, further reactions to the outcome of the poll were minimal.

RTL news claimed that 56% of the participants stated they would buy products labelled as containing GM and 73% would buy these GM-labelled products if they were healthier. They concluded that most Dutch consumers were willing to put aside their objections to GM. It is argued however that they did not measure people's opinions but created them because of the design of the questionnaire (16). In the first few questions the level of knowledge on GM-food was tested. It appeared that only one third of all participants had any knowledge of GM and food. Before the actual poll started, all participants, including the ones who had no idea what GM-food was, were given an explanation of what GM is about so they could complete the rest of the questionnaire.

The participants were also questioned about GM-products and their intentions of buying them in supermarkets. RTL reported that 39% said they knew how to tell if a product contains GM-ingredients; almost all participants said that it was indicated on the package. However only 0.5% could describe correctly how one could tell GM-labelled products apart from regular ones. Only 7% of the people who are responsible for the daily shopping know what genetic modification is and take that into account while shopping; 76% said they never took GM into account while shopping.

Compared with earlier studies and polls (2, 3), these data show an increasing acceptance of GM-foods. However, knowing how these statements of opinion were obtained puts the results in a different perspective. But the RTL poll certainly did show that in general the participants had a low level of knowledge on genetic modification.

The most recent Eurobarometer suggests that the Dutch are very familiar with the technology

of GM-food and, indeed,, 89% said they heard something about it (3). This does not mean they have a good understanding or that they are aware that GM-foods are for sale as suggested by the RTL poll. We therefore undertook a more focused investigation to find what kind of information on GM and food is available for the Dutch public in supermarkets and on the internet.

Information for consumers and the public in general is quite limited. None could be found in any of the supermarkets and what there was on their websites was very limited. In 2006 a few supermarkets had a statement about GM-food on their websites but by early 2008 they had disappeared.

Attempting to find any information on GM-food on the internet as a consumer might do revealed several websites in the Dutch language that provide information on genetic modification, GM in food and labelling. However, most of the websites just displayed information arranged by larger overall topics (food, medicine or industry) on the concept of GM. These topics were discussed in greater detail as soon as one followed the relevant link. There were also websites that focussed solely on one specific topic. Thus, Voedingscentrum (17) has a website where one could order a special package with more information about GM-labels on food. The tone of voice or attitude varied from website to website, ranging from neutral, from simply providing information to being very negative. This framing of news or information on GM has also been found in another study (18). The way the information is framed inevitably influences people's opinions towards GM and food.

Media survey analyses

It is not only specific information on GM and food that has an influence on people's opinions on the issue. What is published in the mass media, the newspapers, radio or television, is also likely to have an effect or influence on people's opinion and possibly their behaviour. To obtain a sense of what issues were published in the media and how much was published we undertook two different media analyses. The first collection of clippings and the results to be described were part of the CONSUMERCHOICE project programme. The second clipping collection was carried out to explore the wider context of the many articles on genetic modification and other relevant material published in Dutch newspapers before the start of the CONSUMERCHOICE project.

Clipping collection NIABA (Dutch Biotechnology Industry Organisation; <http://www.niaba.nl>)

A total of 311 items on GM and food related issues was selected from the broader NIABA clipping service between 1 July 2006 and 1 March 2008. From these 311 items, 164 articles came from *Agrarisch Dagblad* (29) while 148 articles originated from the general newspapers. (Note that *Argarisch Dagblad* is a specialist newspaper aimed at people working in agriculture and related areas. Their entries were not taken into account in this media analyses as most consumers normally would not have seen them.) The national newspapers showed a slight decrease in the number of published articles of interest for this topic over time. Overall, most articles were found in May and June 2007.

Most were news items and hence event driven rather than led by opinion. Using the methodology agreed by the CONSUMERCHOICE partners, only ten comments and two letters were found in the clipping collection. The tone of most articles toward genetic modification was neutral (88%). The newspapers simply wrote about what had happened

without any judgement about gene technology. Many articles were found to cover an unfavourable event but were neutral towards GM.

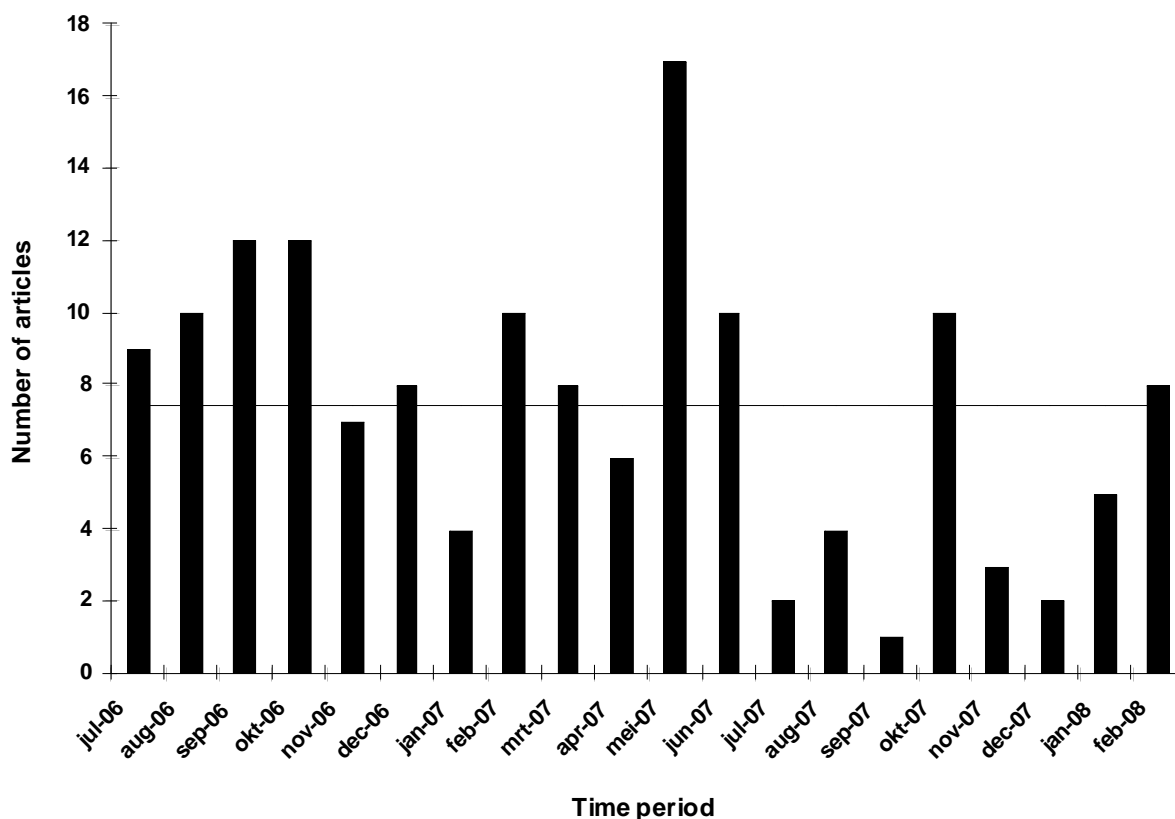


Fig 1: Total number of newspaper articles on genetic modification and food topics in Dutch national newspapers (1.7.06 - 29.2.08) by month. The horizontal line indicates the average number of articles per month (7.4) Data from the NIABA clipping service.

On average, 7.4 articles per month were found in the clipping service for the duration of the project. The peaks with more articles than average suggest there was a story at that time about GM and food covered by the newspapers. The most important of those stories in the Dutch media are discussed below:

From August 2006 to October 2006, media coverage on GM and food was fed mainly by two incidents. The first story was about the import from the United States of unapproved and therefore illegal GM-rice varieties into Europe. The second was similar to the first but this time it concerned GM-rice being imported from China.

The newspapers reported on the very late notification by the US to Brussels on the import of a shipment of into Europe containing traces of the unapproved GM-rice, Bayer having discovered that a large shipment of rice from the US was contaminated with the LL Rice 601 variety. Newspapers reported that it was a very controversial variety as it could cause severe allergic reactions. Bayer notified the US authorities who failed immediately to inform Brussels about the possible arrival of the ship. This was followed by many media articles, with irritated reactions coming from Brussels. It was further reported that this episode led to a discussion in Parliament on how to improve regulation and check what kinds of goods are imported into Europe. A regulation resulted requiring traders to prove by some sort safety

certificate what the shipment contained.

A few weeks later the newspapers reported on a shipment with the same unapproved rice originating from China. This discovery restarted the debate on safety checks and who is responsible for preventing the illegal import of GM-crops into Europe, again broadly covered in the media. This time round media reports were also fed with input from several NGOs. The newspapers eventually reported that the EU had decided to test all shipments of imported rice and maize to ensure consumer safety. Later the media reported EFSA as saying they expected more of these incidents to happen over time.

In February 2007 the media covered the outcome of the one opinion poll on GM held in The Netherlands during the CONSUMERCHOICE project.

In May and June 2007, the media covered widely a discovery by Greenpeace in Rotterdam harbour of an illegal import of GM-maize from the US. This was followed by a more restricted media discussion on the ability of the Dutch Food and Consumer Product Safety Authority to check every incoming shipment for illegal GMOs.

In October 2007 the media was captivated by two other different stories. The first was about Austria which declared itself a GM-free zone by banning all GM-maize. Newspapers reported that as controversial because the ban would apply to EU approved-varieties. It was reported that the Environmental Council was unable to change the situation due to a lack of majority and that the European Court of Justice would have to deal with the issue. The second story was that the EU had just approved the import of three new GM-varieties bringing the total number of GM products allowed onto the market to fifteen. Newspapers reported that farmers and companies are not allowed to grow or produce these varieties but they can be imported from the US.

- *Total newspaper selection Lexis Nexis*

As a cross-check on the NIABA media collection and for a better understanding of the total number of articles published in Dutch newspapers over a longer period of time, a second media search was performed with GM keywords using the Lexis Nexis database for 1989 to 2006. The search criteria were: “Genetic modified with wildcard, Genetic manipulated with wildcard, Genetic modified food, Genetic manipulated food & GM food”. This search included the main Dutch national newspapers and magazines only (*AD, De Tijd, Financieel Dagblad, NRC Handelsblad, Parool, De Telegraaf, Trouw and de Volkskrant*).

Fig. 2 shows that most articles on genetic modification/manipulation were published around 1999 – 2000 when the public debate on *Eten en Genen* (Food and Genes) took place. The results show that, on average, only one third of all the items published is on GM and food. Not all GM-related articles deal with food issues. Furthermore, the results suggest the media prefer using the term “manipulation” rather than “modification”. The reason may be because issues and controversies dealing with GM are often initiated by NGOs antagonistic to GM who seem to prefer the term manipulation, perhaps because they feel it has greater impact for their cause (6).

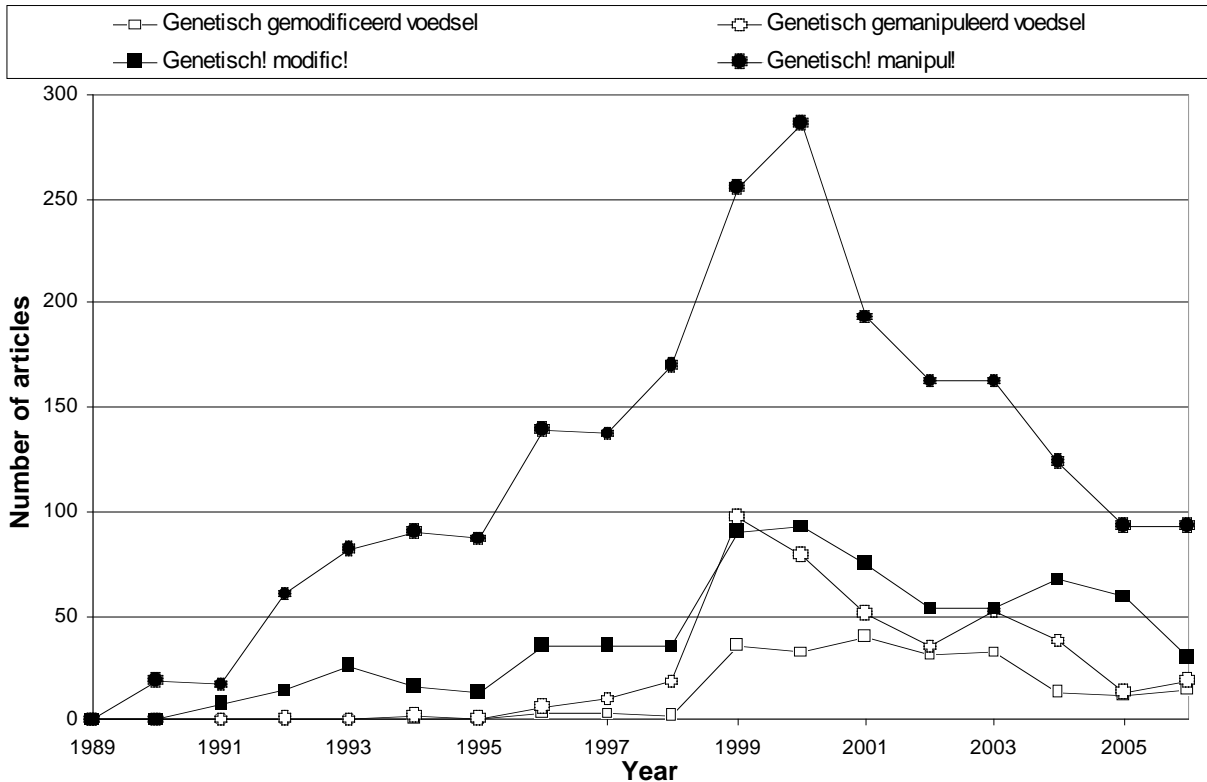


Fig. 2: Total numbers GM articles per year in Dutch national newspapers (1989-2006). Genetic modification (-□-); manipulation of food (-○-); wildcard options for both categories (both black series).

From 1990 onwards, all selection criteria show a gradual increase in the number of publications over time with a peak in the year 2000 followed by a gradual decrease thereafter. The numbers of publications on any of the GM plus food criteria show a rapid increase from 1998 to 2000. The interest in GM in the political sphere was also decreasing. The number of articles in the NIABA clipping collection confirms a further decrease of media attention on GM and food. In 2007 there were only 77 articles in the Dutch national press. This decrease of media interest in GM has also been found in other studies (181).

Further details about the media survey are given in Appendix 3 (page 11-21).

Food store surveys

Surveys were conducted to obtain an overview of the kinds of GM-labelled products on sale in supermarkets and how likely it is for a consumer to buy GM-labelled products.

Store surveys were first carried out on the basis of a GM shopping list (19) published on the Dutch Greenpeace website. Once all shops with GM-products were identified, the search was expanded to other products in those supermarkets. Producers or wholesalers were identified for GM-labelled products because, it was reasoned, what wholesalers sell to one supermarket they also sell to others. For instance, Goldsun Salad Oil (a GM-labelled product) was found in different supermarkets. Based on this approach we were able to create an overview of the relationships between and among different supermarket chains (Fig 3). It lists all trade organisations in the Netherlands in descending order of their market penetration, given in

percentages. The boxes indicate the different supermarkets supplied by the same trade organisation. The boxes with the dotted lines indicate supermarkets likely to be supplied with GM-labelled food. However this does not necessarily mean that all supermarkets in the same box will actually sell them: while they often have the same supermarket private label or lesser-brand products supplied by the same wholesaler, depending on their product range they might or might not offer the same GM-labelled products.

Based on this overview of trade organisations, supermarkets offering GM-labelled products were identified (in the boxes with dotted lines) and their websites checked for relevant policy statements. Because The Netherlands has so many supermarket chains, just a few were selected for regular shop inspections: Albert Heijn (AH), Nettorama, C1000, Jumbo, Aldi (for further details about supermarkets see Appendix 2 (page 11-18)).

In total, 18 products labelled as containing GM were found (see Appendix 2, page 11-20). All were labelled according to EU Regulations (EC) 1829/2003 and 1830/2003. All GM-labelled products were shelved within their own product ranges, GM-labelled oils together with other oils, etc. It soon became clear that there were no special GM departments in any of the supermarkets monitored in marked contrast to organic products which did have their own special shelves or departments within the different product categories and were easy to recognise because of the mainly green layout. Only one product was found with a GM-free label: free range eggs. This was strange as, according to Dutch law, “GM-free” labelling is forbidden in The Netherlands (21). The term “GM-free” may not be used to label products. Products to be indicated as not containing GM-ingredients have to carry the rubric “produced without gene technology”. It is not feasible to label all conventional products in this way so only when there is a GM alternative on the market may a conventional product can be labelled as produced without gene technology.

With help from the GfK consumer panel, we were able to calculate the market penetration of all the GM-products found in the store surveys (see Chapter 6). The determination of market penetration is based on all members of the consumer panel who bought any of the GM-labelled products at least once in the 12-month period under review. Together they had a market penetration of 11% with the GfK consumer panel. Most were oil-derived products with soya as the GM-component. A few products contained GM-maize. Seven different soya oils, one salad sauce, five different crisp-cracker-like products, two types of margarine, two types of halvarine, and one type of maize oil was found. All the GM-containing products were either supermarket private label or lesser (B)-brand products.

In most supermarkets the GM-soya oil was the only soya oil available. If one wanted a non-GM-soy oil one had to go to elsewhere. In one supermarket we found two kinds of soy oil, both GM-labelled. The five different crisp-cracker-like products (two being private label) could be traced back to two manufacturers who both use GM-maize. For one type of crisp-cracker-like product the manufacturer used both GM-maize and -soya. Five of the eighteen GM-labelled products were to be found in one supermarket, sold under the supermarket's private label.

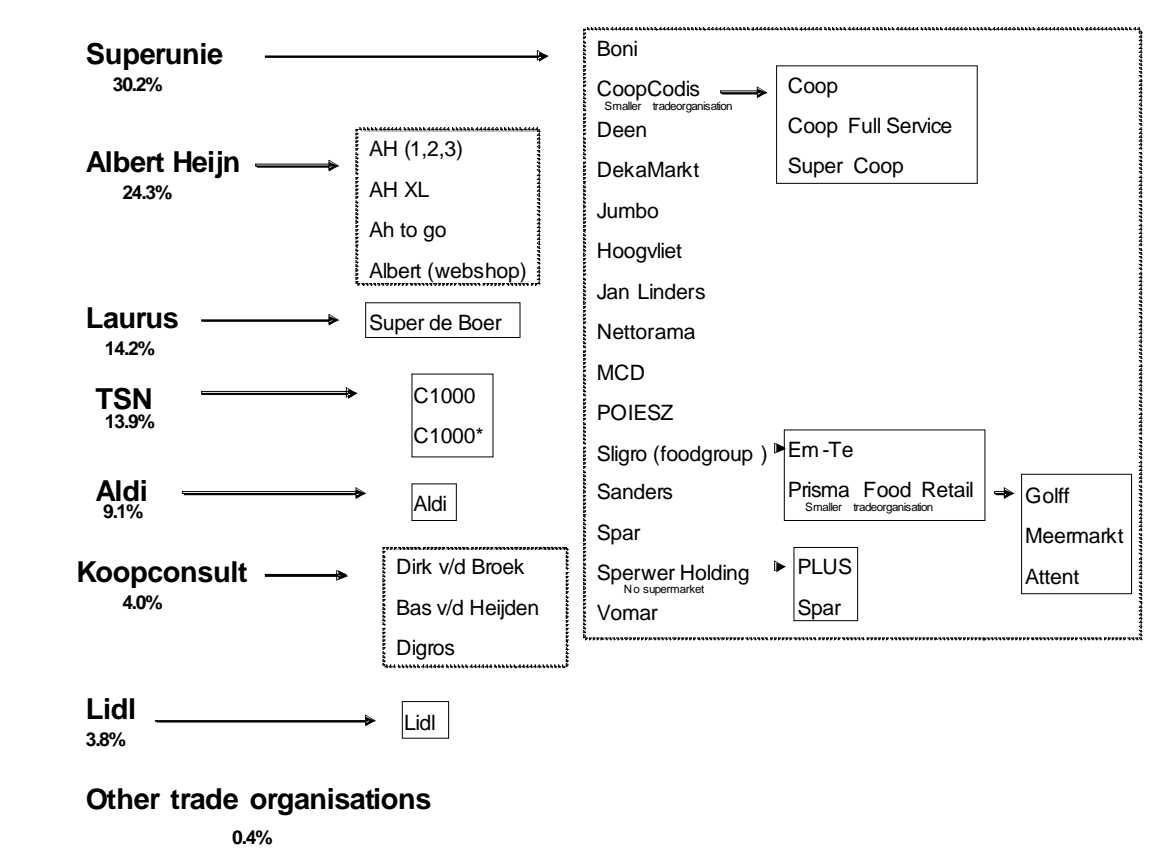


Fig. 3: Overview of supermarkets and their supplying trade organisations in The Netherlands. The market share of the trade organisations is given in percentages (20). The boxes within the dotted lines indicate wholesalers supplying supermarkets with GM-labelled products.

During the *Eten en Genen* (Food and Genes) debate on GM and food, and before the EU regulations for labelling GM-food products in supermarkets came into effect, the number of products known to contain more than 0.9% GM decreased dramatically (18). From the 130 known products that presumably were labelled to contain GM voluntarily before the debate, only 18 different GM-labelled products are still present in the shops (22). They all remained on sale throughout the CONSUMERCHOICE project which indicates that they are still being bought by Dutch consumers. Some argue that the tone of the debate made supermarkets change their position which they based on consumer’s perceived attitudes towards GM-food (23). The decrease of the number of products might have even been larger because, before labelling became mandatory, more products might have contained GM-ingredients. There are no premium brand GM-products left. The remaining GM-products carry mainly the supermarkets private label or B-brand which are the cheaper product ranges. With soya being the most widely grown GM-crop worldwide it is not surprising most GM-labelled products contained GM-soya (24).

Focus groups

Four focus group discussions were held in Delft in January and February 2008 to obtain a more qualitative understanding of consumer attitudes and behaviour to GM-food and GM-labelled products. The methodology was as described in Chapter 5. However, because in The Netherlands there are GM-labelled products for sale, an additional experiment was included. See Appendix 4 (page 11-24) for a description of the Dutch focus groups.

Shopping criteria

To explore the criteria consumers use in their purchase decisions when shopping for food we asked the participants to give account of what they consider important while shopping and information on which they base their decisions. Do they take into account the possibility of a product containing GM?

Content analyses of the discussions resulted in elucidation of factors the participants use in their decision of what to buy (Table 1). The possibility of a product containing GM-ingredients was not one of them. This was also demonstrated by a choice experiment performed during the focus groups in which participants were asked to indicate which product they would buy and give reasons for their choices. Our findings correspond with the findings of the Eurobarometer on risk issues (25); there, too, quality and price were the most influential criteria for consumers' choice.

to buy	not to buy
price	expiry date
need	environmental aspects
appeal	health

Table 1: Most important consumer shopping criteria

For information on what or what not to buy, hearsay from friends or family was most important, followed by a variety of commercial sources including flyers, brochures or signs in supermarkets. Information derived from NGOs or newspapers was largely ignored. Hardly anybody read package labels (26) which were mainly taken into account when consumers had special dietary requirements, confirming another Dutch study (27). Participants claimed they bought the same products every time they went shopping and were not much influenced by stories in the media of possible food risk. Overall, the GM-label was not noticed and not taken into account in participants' selection processes.

Knowledge and awareness

When the participants were confronted with the fact that there were a few GM-containing products on the table at the discussion they were all eager to learn which they were. They were surprised to learn that such products are on sale in supermarkets and that they have to be labelled. They said they themselves had never come across products that were labelled. Although all the participants in the discussion had some general idea of genetic modification, they claimed to be lacking information. Such a low level of knowledge has been clear in other studies (19, 28).

Attitudes

The participants felt that, because they lacked sufficient knowledge and understanding of GM, they found it difficult to discuss the issues at hand and to justify their arguments and opinions; as a result their opinions tend to be based on intuition. Although they had a negative image of GM, they could also see possible benefits for farmers and the environment; this had a marked impact on their opinion and generated overall more positive attitude towards GM-ingredients in consumer products than that with which they had begun the focus group session. They argued: “some of these products were healthier than conventional products so they can’t be bad for your health” and “if the products are for sale in the supermarkets they must be safe for consumption so why not.”

A change from a negative view to a more positive one was also found in the 2004 Dutch study (28). GM in food is not considered to be a safety issue, especially not while shopping. The Dutch people consider retailers to be one of the most trusted sources for food safety (3). The 2006 Eurobarometer results on risk issues further showed that the Dutch are the least worried (55% do not worry) about genetic modified products in their food or drinks of all the EU countries (25).

Willingness to buy

At the end of the discussion the participants were asked if they would have a problem with buying GM-products: were they willing to buy if they knew about the GM-ingredients? Most of them said “no”; they would not have a problem. They used the same types of motivation for buying GM-products as they already used for their attitudes as stated above. The 2005 Eurobarometer on Europeans and Biotechnology (3) also showed that The Netherlands is one of the EU countries least likely completely to reject GM-foods under all circumstances (only 12% would do so). Some participants still considered they lacked the knowledge to make the decision. The few participants who wished to avoid GM-products were pleased to learn that they could in future see for themselves if a product contains GM and not buy it.

Conclusion and discussion

Our study shows that after a long history of debate on genetic modification and food, and notwithstanding the fact that most political parties had a publicly stated policy on GM, it was not an issue during the last elections and no longer seems to be a pressing political matter in The Netherlands. All stakeholders involved in the political and public debates on GM and food have settled into their positions and attitudes towards genetic modification, and regulations and guidelines have been into place to facilitate choice if consumers wish to exercise it.

GM is no longer a top-line story for the media nor has it been since 2000. The number of newspaper articles per month continually decreases, with most of them on GM-crops and their regulation. As a proportion of total media activity, GM-issues – and specifically GM-food – constituted on average a very small proportion of the total number of news items. Almost all items were event-driven in the form of news reports and so very neutral in their attitudes.

The recent opinion poll by TNS NIPO (19) demonstrated that the overall knowledge among the public remains very low, possibly because there is so little public information on GM and food available. What there was on the internet was often inadequate and one sided, failing to

paint the whole picture.

This low level of knowledge was also apparent in the focus group discussions so participants found it difficult to express their attitudes. What they did say tended to be based on emotion and intuition.

Participants' overall attitude was positive with most expressing a willingness to buy GM-labelled products. But their opportunities are limited by the small number of products available, with no more than 18 GM-labelled products on sale in Dutch supermarkets, mainly products containing soya oil. However, the fact that these products have remained on sale during the whole of the project period and are still there must mean that they are being bought by Dutch consumers – grocery store shelf space is valuable and products not in demand are quickly withdrawn.

The focus group discussions showed that the availability of GM-labelled products in supermarkets is not considered to be a problem by Dutch consumers; they all expressed their willingness to buy them. Reasons for the absence of a problem might follow from consumers' low level of knowledge and awareness plus the fact they encounter few such products. Nevertheless, it was clear from the discussions that other shopping criteria were much more important than GM in their purchasing decisions.

The aim of this study was to compare actual consumer behaviour towards GM-labelled products with purchasing intentions of GM-food expressed in response to opinion polls and questionnaires. Our findings show that the relation between people's perceived behaviour and their expressed intentions by no means always correlate to their actual behaviour. *There is a clear difference between what people offer as an opinion or perceived behaviour and what they actually do.*

According to the Eurobarometer (3), only 25% of the Dutch population overtly support GM as a technology and GM-food. One might therefore expect that the public's overall attitude to GM-food would be negative and they would avoid buying GM-labelled products. But our data show that this negative opinion is overestimated as expressed by consumers' actual willingness to buy GM-food which in turn supports the Eurobarometer conclusion (3) that The Netherlands has the highest percentage of potential buyers of GM-foods. Our results also correlate with the Eurobarometer conclusion that GM-ingredients in food are not considered to be an issue when choosing food products (3) and indicates a real market opportunity for more GM-labelled products.

Finally, the Eurobarometer stated that 95% of the Dutch said they have heard something about GM (3). This suggests that the level of awareness amongst the Dutch of GM and food-related issues is significant but our own results suggest that consumers' level of knowledge was limited, resulting in opinions being expressed based mainly on gut feelings.

References

1. Gaskell, G., Allum, N., Bauer, M., Durant, J., Allansdottir, A., Bonfadelli, H., Boy, D., de Cheveigné, S., Fjaestad, B., Gutteling, J.M., Hampel, J., Jelsøe, E., Correia Jesuino, J., Kohring, M., Kronberger, N., Midden, C., Nielsen, T.H., Przystalski, A., Rusanen, T., Sakellaris, G., Torgersen, H., Twardowski, T. & Wagner, W. (2000) *Biotechnology and the European public*. Nature Biotechnology, **18**, 935-938.

2. Terlouw, J.C. *Eten en Genen: een publiek debat over biotechnologie en voedsel* Rapport 9 januari 2002
3. Special Eurobarometer: *Europeans and Biotechnology in 2005*, 244b, July 2006 Wave 64.3
4. Cheftel, J. C. (2005), *Food and nutrition labelling in the European Union*, Food Chemistry, **93**(3), 531-550.
5. CoGem (2004) *Achtergrond studies Trendanalyse Biotechnologie 2004*. Gezamenlijke notitie van de Commissie Biotechnologie bij Dieren (CBD), de Centrale Commissie Mensgebonden Onderzoek (CCMO) en de Commissie voor Genetische Modificatie, juli 2004, Den Haag
6. Stichting Voedingscentrum Nederland (2001) *Eten van de biologische landbouw deel II: biologische producten*, Den Haag
7. Gutteling, J. (2002) *Biotechnology in the Netherlands: controversy or consensus?* Public Understanding of Science, **11**, 131-142.
8. Hanssen, L., Gutteling, J.M., Lagerwerf, L., Bartels, J. and Roeterdink, W. (2001) *In the Margins of the Public Debate on "Food and Genes": Research under Commission of the Committee Biotechnology and Food*. Enschede: Twente University (in Dutch)
9. Gutteling, J., Hansen, L., Veer, van den N. & Seydel, E. (2006) *Trust in governance and the acceptance of genetically modified food in The Netherlands*. Public Understanding of Science, **15**, 103-112
10. GMO Compass, Imprint, September 2006, http://www.gmo-compass.org/eng/regulation/coexistence/135.netherlands_coexistence_consensus.html
11. *Verlag Algemeen overleg Tweede Kamer inzake Biotechnologie 15/11*, Ref.nr. 07/0, vrijdag 16 november 2007
12. Ministerie van Binnenlandse zaken en Koninkrijksrelaties, Overheid.nl, oktober 2006, <http://www.overheid.nl/themas/biotechnologie/>
13. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, VROM, oktober 2007, http://www.vrom.nl/Docs/milieu/nota_biotechnologie_def.pdf
14. CoGem (2007) *Trendanalyse Biotechnologie 2007, Kansen en Keuzes*. Gezamenlijke notitie van de Commissie Biotechnologie bij Dieren (CBD), de Centrale Commissie Mensgebonden Onderzoek (CCMO) en de Commissie voor Genetische Modificatie, May 2007, Den Haag.
15. RTL Nederland Interactief, RTL Nieuws.nl, 25 februari 2007, [http://www.rtl.nl/\(actueel/rtlnieuws\)/components/actueel/rtlnieuws/2007/02_februari/25/binnenland/0225_1900_gen_voedsel.xml](http://www.rtl.nl/(actueel/rtlnieuws)/components/actueel/rtlnieuws/2007/02_februari/25/binnenland/0225_1900_gen_voedsel.xml)
16. W.L. Tiemeijer (2008) *Wat 93.7 procent van de Nederlanders moet weten over opiniepeilingen*. Askant, Amsterdam
17. Stichting Voedingcentrum Nederland, Voedingscentrum, Eerlijk over Eten, May 2007, <http://www.voedingscentrum.nl> , (In Dutch)
18. Cook, G. Robbins, P.T., Pieri, E. (2006) *"Words of mass destruction": British newspaper coverage of the genetically modified food debate, expert and non-expert reactions*. Public Understanding of Science, **15**, 5-29.

19. Greenpeace, Greenpeace Nederland, 23 March 2007, <http://www.greenpeaceweb.org/ezine/bonnetje.htm>
20. European Marketing Distribution, Dr P. Hampl, 21 December 2006, <http://www.emd-ag.com>
21. *Warenwet besluit nieuwe voedingsmiddelen*, 1997, Den Haag.
22. De Telegraaf 16 September 1999 and De Volkskrant 2 Oktober 1999
23. Consumentenbond (2003) *Geworstel met Gentech*. Consumentengids december 2003: 32-34
24. The International Service for the Acquisition of Agri-biotech Applications, February 2008, www.isaaa.org
25. European Commission (2006) *Special Issue Eurobarometer 238/Wave 64.1, Risk Issues*, February 2006
26. Hanning, C. & Veen, van der G. (1999) *Effectiviteit van levensmiddelenetiketten volgens consumenten, Eindrapport. SWOKA, in opdracht van Ministerie van VROM en LNV, Leiden, 5 maart, 1999.*
27. Vriend, de H.C. (2005) *Evaluatie Europese GGO-regelgeving: keuzevrijheid voor de consumenten. LIS Consult*
28. Vriend, de H.C. (2004) *Burgers en trends in biotechnologie: onderzoek naar warden en doelen*. Bijlage 1 bij kabinetsreactie op trendanalyse Biotechnologie 2004. VROM.

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APPENDIX 1: POLITICAL LANDSCAPE

This appendix presents the methodological considerations underlying the Dutch study and amplifies some of the information presented in the main body of this chapter.

For an explanation of general approaches see Chapter 3 (Products, sales), Chapter 4 (Analysis of the European media) and Chapter 5 (Focus groups). We present here data additional to those in the overview chapters.

Political landscape:

- Ministries that deal with biotechnology-related issues:

- Ministry of Health, Welfare and Sports (VWS)
- Ministry of Agriculture, Nature and Food Quality (LNV)
- Ministry of Housing, Spatial Planning and Environment (VROM)
- Ministry of Economic Affairs (EZ)
- Ministry of Foreign Affairs (BZ)
- Ministry of Education, Culture and Science (OCW)
- Ministry of Justice.

- Positions of the main political parties regarding GM and food (production) (numbers of seats are those following the November 2006 election):

- **CDA** (Christian Democrats) (41 seats)

Genetic modifications of animals are non-negotiable. For plants it is agreed only under strict conditions if and when it contributes to more sustainable agriculture and does not affect biodiversity.

- **PvdA** (Social Democrats) (33 seats)

Biotechnology or GM as an issue is not in their actual election programme although on their website though they do have a general statement. For food the party prefers GM-free food and food production. They use the “yes, unless” principle for crops under strict conditions and regulations, and they want GM-products to be labelled for easy recognition by consumers in stores.

- **SP** (Socialists) (25 seats)

Very much against genetic modification. The Dutch government should not invest in GM unless there is a very urgent social need for it.

- **VVD** (Liberals) (22 seats)

They support research in the agribusiness aimed at sustainable production with more attention to the well-being of animals and care for our landscape. Nothing in their election programme mentions GM.

- **Christen Unie** (Christian Conservatives) (6 seats)

There should be no experimental or commercial release of GM-crops to the environment.

Remain critical towards the genetic modification of crops considering that there are unknown effects on the environment and biodiversity.

The governmental policy on GM should not be extended

Government should stimulate alternatives for GM and guarantee GM-free food production.

- **D66** (Liberal Democrats) (3 seats)

See great opportunities for biotechnology in agriculture, environment, third world countries and health. They also see economic opportunities for innovation.

Want a broader application of the technique, especially now it is clear there are hardly any problem associated with growing GM-crops.

Consumer choice on buying GM-food should remain.

- **PvdD** (Issue party for the rights of animals) (2 seats)

Against GM, especially towards animals.

APPENDIX 2: STORE VISITS

Attempts were made to contact all the retailers for insight information but only one agreed to a personal interview. In conversation that retailer was not willing to share sales information for their GM labelled products but confirmed orally that there were no decrease in sales when GM-labelling became mandatory.

Stores visited

1. *Albert Heijn (AH)* (<http://www.ah.nl>)

Albert Heijn operates stores in a number of formats: small supermarkets, larger Albert Heijn XL for the weekly groceries (4,000 square meters), general stores AH and an internet delivery service Albert.nl. All stores stand for quality, a broad choice, a good cost/quality relation, inspiration and innovation.

The chain used to be one of the most expensive supermarkets in the Netherlands but for the past two years they have been trying to change that image by price war between supermarkets and reducing many of their prices. Currently AH occupies the middle of the market.

The AH supermarket chain is well known: it is the founding father of supermarkets in the Netherlands with shops and other outlets throughout the country. It attempts to be a complete supermarket where people can buy everything with no need to shop anywhere else.

AH was the first supermarket in the Netherlands that started to sell biological/organic products with the widest range of products under their biological private label.

In October 2006 AH had the following statement on GM-food on their website:

All our ingredients have to be safe and approved in the EU. This is checked by the Dutch government. In addition to that AH wants to offer their customers a choice. Therefore we attach great significance to clear information, preferably on the packages. If a product contains soya or maize derived ingredients in any form it is indicated on the package whether or not it is genetically modified. However you will no longer often come across this indication; many of our suppliers have altered their formulations and no longer use genetically modified ingredients. For those who prefer products without these ingredients, AH offers excellent alternatives in our regular assortment. For eco products it is by law forbidden to use genetically modified ingredients. This also includes AH organic.

AH Bron: AH website 26-10-2006

The company wants want to inform their customers whether a product contains GM and they want them to have a free choice in buying products that do or do not contain GM-ingredient (1). The Greenpeace report on GM-labelled food in European supermarkets also shows that Ahold does not have a GM-free policy for their products (19). However, in 2007 the AH website was changed and that statement can no longer be found.

C1000 (<http://www.c1000.nl>)

C1000 is one of the two the supermarkets owned by the Schuitema Wholesaler. It is a customer-friendly, full service supermarket that constantly adjusts and responds to the wishes

and needs of their customers. They claim to have a strong and successful formula for their supermarkets in which they combine a price-aggressive character with good quality, high standard products. Schuitema wants to be the reliable model for entrepreneurs who wish to run their own supermarket and who know the local situation. C1000 also want to be a supermarket that helps their customers with their daily shopping by providing them with the best products for the lowest possible price in an orderly store.

They also had a statement on their website assuring their customers that they try to keep their supermarket label products GM-free (25). However, C1000 and Schuitema are partially owned by Ahold and no doubt subscribe to the AH policy.

Nettorama (<http://www.nettorama.nl>)

A Nettorama supermarket can be best described as a trend-setting, premium brand discount supermarket. They offer a wide range of premium brand products for the lowest possible prices and complete their portfolio with a strong private label. They are a self-service innovative supermarket with very high standards for their fresh products, including vegetables, meat, bread, etc. Their price levels for most of their products are 10-15% below that of their competitors, claiming to pass on the advantages of their purchase policies directly to their customers. For that they need no customer loyalty service. Nettorama have 26 supermarkets situated all over the Netherlands but not in Rotterdam, The Hague or Amsterdam

Jumbo (<http://www.jumbosupermarkten.nl>)

Jumbo aims to please their consumers a full 100%. They distinguish themselves from other supermarkets through their excellent and clear communication with their customers. They have seven rules as guarantees for their customers by which they hope improve the supermarket together. For instance, they want to assure their customers that shopping at Jumbo is always at the lowest possible price. If you as a customer know (and can prove) that another supermarket has the same product for a lower price, you can take the product home for free. They want also to be the most efficient supermarket, saving time for their customers. So if there are more than four people in the queue to pay, not all the tills are open and there is no shorter queue to join, you can have all your shopping for free.

For neither Nettorama nor Jumbo have we been able to find any policy statement on GMOs in their products in their stores or in the corporate documents on their websites or on that of their major supplying wholesaler.

Aldi (<http://www.aldi.nl>)

Aldi is a well known German retailer with supermarkets all over The Netherlands and with well-known policies. Aldi was the first supermarket with a discount image. Their stores are always located at cheaper locations to reduce rent and other location-related costs. They have a sober display for their products, a modest range of products, and the individual stores are relatively small. They only sell their own products of the highest possible quality as they purchase directly from the suppliers. Aldi has issued a GM-free undertaking about their products (2).

-GM labelled products on sale

Table 2 lists all the GM-products on sale in the Netherlands.

Table 2. GM-products on sale in the Netherlands

product name	packet	barcode	manufacturer	€	place on the shelf
AH Halvarine/De Zaanse hoeven	500 g	8710400361015	Albert Heijn BV	0.35	low/ floor level
SU Ruitjes Halvarine	500 g	8710624512453	CIV Super Unie BA	0.35	low/ floor level
AH Slaolie	1 Liter	8710400009832	Albert Heijn BV	0.69	low/ floor level
AH Slasaus	750 ml	8710454060063	Van Dijk Food Products (Lopik) BV	0.44	low/ floor level
Markant merk Slaolie	1 Liter	8710458002182	CIV Super Unie BA	0.89	eye level
O'Lacy Slaolie	1 Liter	8710933082708	O'Lacy's International BV	0.69	knee level
Perfect Slaolie	1 Liter	8710624529116	CIV Super Unie BA	0.85	eye level
Goldsun Slaolie (Jumbo)	1 Liter	8710624519568	CIV Super Unie BA	0.52	knee level
Goldsun Slaolie (Plus)	1 Liter	8710624519568	CIV Super Unie BA	0.53	knee level
Bon Appetit Mexicaantjes	115 g	8710624013073	CIV Super Unie BA	0.99	eye level
Jumbo zoutjes Mexciaantjes	115 g	8711299951028	Menken Orlando BV	1.39	eye level
AH Mexicaantjes	90 g	8710400225997	Albert Heijn BV	1.39	high/top shelf
AH Pikantjes	200 g	8710400280736	Albert Heijn BV	2.29	low/ floor level
Osaka Chili Crackers	125 g	8711299000429	Menken Orlando BV	1.55	knee level
Grand Cru Mexicaantjes	115 g	8711299001082	Menken Orlando BV	1.39	knee level
Perfect Maiskiemolie	1 Liter	8710624529130	CIV Super Unie BA		
Plus Slaolie	1 Liter	8710624868284	CIV Super Unie BA	0.59	knee level
SU Ruitjes margarine	250 g	8710624011024	CIV Super Unie BA	0.22	low/ floor level
Rilanto Margarine	500 g	8722100010506	Van Dijk Food Products (Lopik) BV	0.3	eye level

APPENDIX 3: MEDIA SURVEY

Profile of Dutch newspapers

The following profile offers a view of the readership percentages and target readerships for each title. Descriptions of the individual publications are from their websites.

The latest National Media Research (NOM) print monitor data for 2007 were used as circulation and scope indicators. Each year, NOM asks 24,900 respondents in the Netherlands aged 13 years and older which of the more than 200 available newspapers and magazines they read. Based on those data, NOM calculates the percentage of the Dutch citizens who read each particular title. This sample is used as an indicator for the whole Dutch population of 13,597,000 citizens aged 13 years and older.

Agrarisch Dagblad and *het Financieel Dagblad* were not included in the NOM survey, probably because they are too specialised. For them we have therefore used the average total number of copies per issue for 2006, the last complete year at the time we made the survey.

There follow short descriptions of the media from which articles and items were collected for this survey.

Agrarisch Dagblad (<http://www.agd.nl>) – 2006 average 11,319 copies per edition. Aims for news, business development, background stories, political/governmental and financial/economic stories in the agricultural sector. Widely read in the Netherlands.

Algemeen Dagblad (<http://www.ad.nl>) – 2007: percentage = 11.5%. National and (in seven regions) regional daily newspaper, one of the main newspapers in the Randstad, the western part of The Netherlands.

Brabants Dagblad (<http://www.brabantsdagblad.nl>) – 2007: percentage = 3.4%. Daily regional newspaper with 13 editions; read by 55% of the population aged 13 and older in its distribution area.

de Volkskrant (<http://www.volkskrant.nl>) – 2007 percentage = 6.2%. One of the largest circulation national newspapers. The typical reader is better-off than average and most highly educated of the national newspaper readerships.

Het Financieel Dagblad (<http://www.fd.nl/home>) – 2006: average 58,366 copies per edition. Main specialist Dutch source for financial and economic information: national and international coverage business, economics, financial markets and all relevant developments.

Het Parool (<http://www.parool.nl>) – 2007 percentage = 1.8%. Main and most widely read local newspaper in Amsterdam and its surroundings.

NRC Handelsblad (<http://www.nrc.nl>) – 2007 percentage = 4.2%. The only Dutch Monday-Friday afternoon newspaper with an additional a Saturday edition. One of the larger national newspapers which asks something for extra from its readers. It aims to keep its readers sharp or to get them even sharper.

de Telegraaf (<http://www.telegraaf.nl>) –2007 percentage = 16%. Most widely read national newspaper, wishing to write news and insight articles that are comprehensible for everyone. Their target group is everyone who can read Dutch.

de Trouw (<http://www.trouw.nl>) – 2007 percentage = 2.5%. Places high value on depth and personal development; a paper for people with an ideology.

Metro (<http://www.metronieuws.nl>) – 2007 percentage = 14.3%. One of four free Monday-Friday newspapers in the Netherlands, distributed at railway stations, in the Rotterdam metro system, on certain bus routes, in 160 post offices, 222 Mc Donald's restaurants, airplanes, hospitals etc. The typical reader is young (46% less than 35 years old), well educated (74%); most (58%) are employed or students (23%).

De Pers (<http://www.depers.nl>) – 2007 percentage = 6%. Third free newspaper, distributed at railway stations, shopping centres and petrol stations Monday-Friday, with a special Saturday edition. Wants to convey a mood of optimism.

HP de Tijd (<http://www.hpdetijd.nl>) –2007 percentage = 2.2%. Weekly opinion magazine that tries to sketch social dilemmas and to place them in a broader picture.; readers mostly interested in economics and investments.

Elsevier (<http://www.elsevier.nl>) –2007 percentage = 6.1%. Weekly opinion magazine wanting to create order in the information chaos. Readers are well educated, higher class and working people, many occupying in decision-making positions.

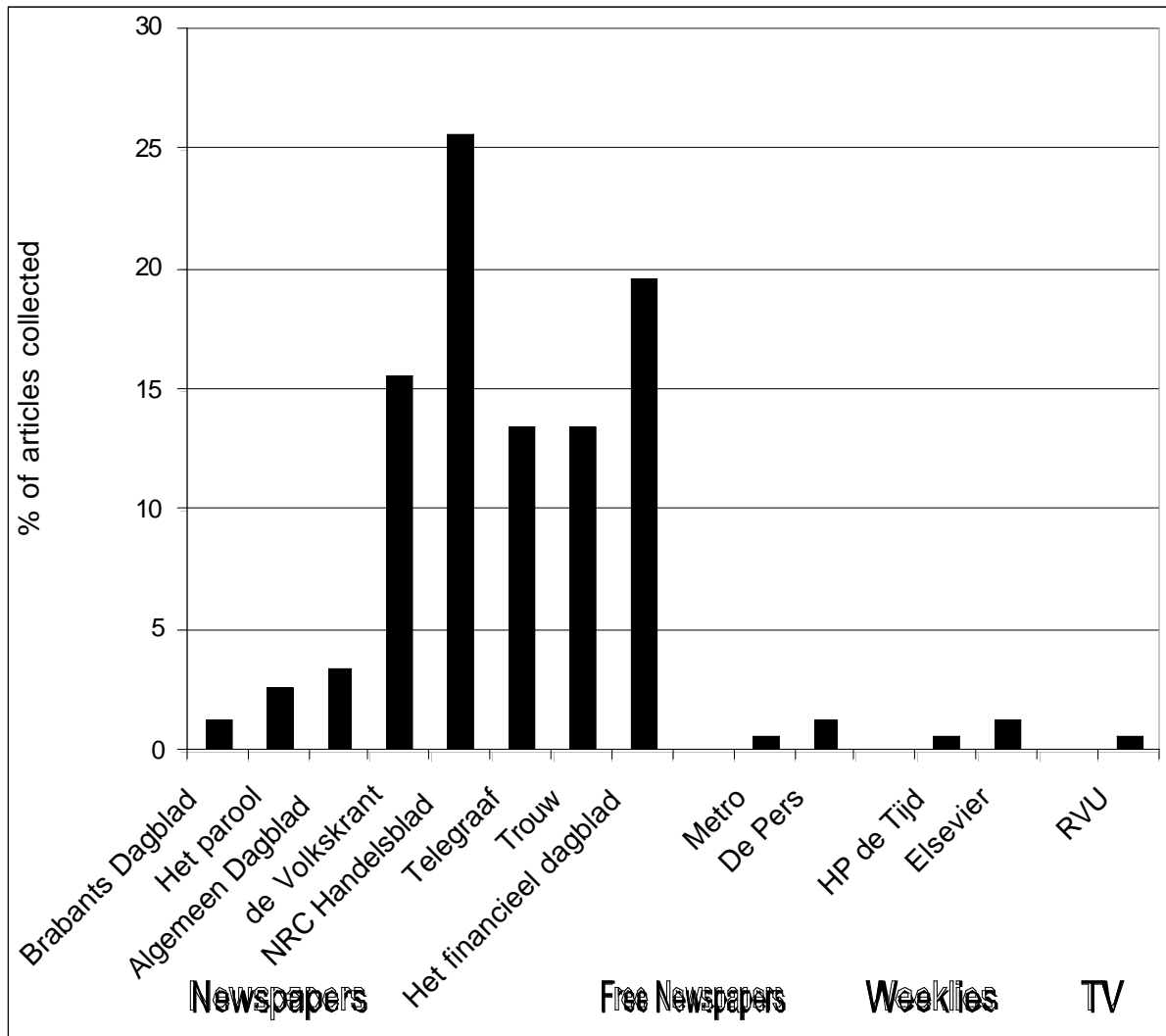


Fig. 4. GM-related articles in the Dutch press. Of all the national newspapers the *NRC Handelsblad* publishes the most followed by *Financieel Dagblad* and *de Volkskrant*. The regional newspapers *Brabants Dagblad*, *het Parool* and *Algemeen Dagblad*, and the free newspapers *Metro* and *De Pers* publish fewer articles. Not many articles appeared found in the weeklies *HP de Tijd* and *Elsevier*; all of their items were opinion pieces.

APPENDIX 4: FOCUS GROUPS IN THE NETHERLANDS

The first criterion for selecting people for the focus groups was that they had to be directly or indirectly involved in food purchases: these are the people who would come across a GM-label in supermarkets. Additional candidates might be those who have a say in what is been bought without doing the shopping themselves; they are more indirectly involved with food purchases. This omits younger children (who rely on their parents) and old or infirm people living in institutions people who are usually provided with food by others.

People were chosen on the basis of age and level of education. Using levels of education had two purposes: (i) to avoid hierarchies and possible clashes between participants' social status, and (ii) more educated people might intimidate those with less education by a more skilled use of language while knowledgeable people might dominate the discussion. The division based on age addressed the likelihood that very different age groups might have different eating and shopping habits.

Table 2: Age, education level, gender, number of participants for each of the four focus groups

Age	Education level	Number/gender
Group 1, 30-60	High School	1 man 4 women
Group 2, 20-30	High School	3 men 1 woman
Group 3, 20-30	University	3 men 2 women
Group 4, 30-60	University	2 men 2 women

The basis for the invitation was to discuss doing the weekly shopping and product labels. Any mention of GM in the invitation was avoided as it might have attracted opinionated people to join the discussion solely to express their negative or positive views. Mentioning GM-labelling could also be a trigger for them to be prepared about what is in the food stores and so influence their opinion before the discussion.

Each focus group had two moderators enabling us to comment on the discussion and to also make notes for later use. With the permission of all the participants, all the sessions were recorded for subsequent transcription verbatim and further data analyses. Each session lasted about 90 minutes.

Overlapping speech, emphasis and pauses were noted. Personal names and names of towns were not transcribed to preserve participants' anonymity. The quotations below were translated into English and adapted to the conventions of the written language.

A horizontal strategy was used for the data analyses, looking for reoccurring themes in the discussions rather than for similarities and differences between the different groups.

Questions and assignments

The discussion was structured on the basis of a few questions and assignments:

- what are your important criteria while shopping, and why?
- can you cluster all your criteria and give the groups a name?
- do you also have important criteria about not buying a product?
- how do you find out what to buy? What are important sources of information and why?
- what kind of information should be written on a product label, and why? Do you often read labels? Why?
- what are the top three points that should be on a package label.
- please indicate which product you would buy and why (participants were asked to write a short note on their choices before they were discussed)?
- have you ever bought one of these products?
- one of these products contains GM-ingredients; do you know what GM is?
- what are your views about GM-food?
- is it important for you to take GM-food into account?
- now that you know, would you make another choice? Why?

Making a choice

The participants were next asked to choose between several types of halvarine (a low-fat butter substitute for spreading on bread) and, when time allowed, they were also asked to choose between several types of salad sauce.

The participants were presented with four different types of halvarine all of which could be bought from Albert Heijn (AH). The choices lay between Zaanse Hoeve Halvarine (which contains GM-soya), AH private label halvarine, Blue Band as a premium brand and AH organic butter (there was no organic halvarine available). The GM-version (€ 0.35) was the cheapest followed by the AH own brand (€ 0.75), Blue Band (€ 0.94) and the organic butter (€ 1.49). For information, the price of each product was written on the underside of the container. All the halvarines were in similarly-sized packs of 500 g.; the butter was 250 g.



Participants were invited to have a good look at all the products and to take into account all the criteria they had mentioned earlier. They could hold the packages and turn them upside down, just as they could in a supermarket.

When there was enough time, a similar exercise was repeated with natural flavoured salad sauce. They could choose between AH euroshopper salad sauce (which contains GM), Gouda's Glorie salad sauce as the premium brand and "Perfect" as the supermarket's private label although it was not from Albert Heijn as the euroshopper was the only natural salad sauce available. The GM-version was again the cheapest (€ 0.44) and had the largest volume (750 ml) followed by the supermarket private label (€ 0.79) and the premium label (€ 1.05), both 500 ml.

The participants were asked to make a choice about whether or not they would normally buy halvarine or salad sauce.



The products were labelled A, B, C or D; participants were asked to write down for themselves which product they would buy. Once everyone had made their choice, the participants were asked which product they would buy and why.

References

1. Stichting Natuur en Milieu, December 2003
(http://www.snm.nl/pdf/0003_database_mvactiviteiten_negen_nederlandse_supermarkten_2003.pdf)
2. EU Markets: *No market for GM labeled food in Europe*. Greenpeace report, 2005