

**EUROBAROMETER 52.1**

**THE EUROPEANS AND  
BIOTECHNOLOGY**

**REPORT BY**

**INRA (EUROPE) - ECOSA**

**ON BEHALF OF**

**Directorate-General for Research  
Directorate B - Quality of Life and  
Management of Living Resources Programme**

**MANAGED AND ORGANISED BY**

**Directorate-General for Education  
and Culture "Citizens' Centre"  
(Public Opinion Analysis Unit)**

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This opinion poll, managed and organised by the Directorate-General for Education and Culture's "Citizens' Centre" (Public Opinion Analysis Unit), was carried out at the request of the European Commission's Directorate-General for Research, " Life Sciences Directorate".

It was carried out in every country of the European Union, between 1 November and 15 December 1999, under the general coordination of INRA (EUROPE) - European Coordination Office, located in Brussels.

The questionnaire, the names of the institutes involved in the research and the technical specifications are included in an annex.

The European Commission is in no way responsible for this report.

The original language of this report is French.

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## Introduction

The opinion poll analysed in this report was carried out in the fifteen Member States of the European Union, between 1 November and 15 December 1999, within the framework of the Eurobarometer<sup>1</sup> 52.1, at the request of the European Commission's Directorate-General for Research, "Life Sciences Directorate". This survey is managed and organised by the "Citizens' Centre" (Public Opinion Analysis Unit) of the European Commission's Directorate-General for Education and Culture.

This report looks at Europeans' attitudes to various problems connected with biotechnology. It is divided into several chapters concerning:

- The attitude (or more precisely the attitudes) of Europeans to the development of biotechnology
- The expectations of Europeans in this field
- Europeans' knowledge of genetics
- A forecast of people's future attitudes
- The view that work carried out is provided by scientists and the other groups involved in the development of biotechnology
- The groups they trust in this field

This survey is the fourth in a series of Eurobarometer studies covering the same subject:

- The first was conducted in autumn 1991 (Eurobarometer 35.1). It was carried out in the twelve countries which then formed the European Community and covered a total sample of approximately 12 800 people. The scope of this study covered the attitude of Europeans vis-à-vis the developments of science in the field of biotechnology, but also tested their level of knowledge in this matter and highlighted the sources of information they trusted.

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<sup>1</sup> Eurobarometer surveys, or more precisely the "standard Eurobarometer surveys", have been conducted since 1973 (EB N° 0), on behalf of the former Directorate-General X of the European Commission, now the Directorate-General for Education and Culture. They have included Greece since autumn 1980, Portugal and Spain since autumn 1985, East Germany since autumn 1990, and Austria, Finland and Sweden since spring 1995.

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- The second was in spring 1993 (Eurobarometer 39.1). It was also conducted in the twelve Member States and covered a total sample of 13 032 individuals. The vast majority of the questions were the same as those in the previous study. The new questions were aimed at assessing the knowledge of those interviewed, from the point of view of the subjective difficulty of the questions included in the study, and took a new look at the attitudes and opinions of the people of Europe.
  - The third was conducted in autumn 1996 (Eurobarometer 46.1) in the fifteen Member States and 16 246 people were interviewed on the basis of a majority of new questions covering the principal topics of interest. Only some of the questions from the previous study were retained.

This opinion poll consists of six new questions, four TREND questions and two MODIFIED TREND questions from the previous survey as well as one TREND question from the question pool of the Public Opinion Analysis Unit.

It is important to point out that all the changes made to the old questions were designed to simplify or eliminate tendentious wording. Moreover, it is still possible to highlight trends provided that the framework for analysis is clearly set out. And finally, these simpler, more neutral questions constitute an excellent platform for drawing up subsequent studies.

In each country, these questions were put to a representative sample of the national population over 15 years of age. In all, 16 082 people were surveyed, that is, an average of around 1 000 people per country except for Germany (2 000: 1 000 in the new Länder and 1 000 in the old Länder), the United Kingdom (1 300: 1 000 in Great Britain and 300 in Northern Ireland) and Luxembourg (600). We must point out that the figures given in this report for the European Union as a whole are a weighted average of the national figures. For each country, the weighting used is the proportion of the national population over 15 years of age in relation to the Community population over 15 years of age (cf. technical specifications in the annex).

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The technical specifications attached provide details of the methodology involved (survey dates, selection of the sample, population covered, weighting, confidence limits, and so on). We must clarify some of the terms used in these technical specifications: marginal weighting is that which is based on one variable, such as age or sex, whilst cross weighting is based on the cross-referencing of two variables, such as age and sex. The NUTS regions are “a classification of the regions of the European Union according to a hierarchical structure of three levels”. The Eurobarometer is weighted on the basis of the NUTS 2 regions.

It is also important to note that the total percentages presented in the graphs illustrating the report and in the tables forming the annexes can add up to more than 100% where questions allow for several responses. In addition, the totals may not always add up exactly to 100%, but a number very close to it (for example, 99% or 101%), because of figures being rounded off.

The abbreviations used to designate the Member States are as follows:

B	Belgium
DK	Denmark
WD	Old Länder
D	Germany
OD	New Länder
GR	Greece
E	Spain
F	France
IRL	Ireland
I	Italy
L	Luxembourg
NL	Netherlands
A	Austria
P	Portugal
FIN	Finland
S	Sweden
UK	United Kingdom

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A comment is necessary with regard to the separation of the old and new Länder of Germany, which was justified when East Germany was included in the list of countries covered by Eurobarometer in autumn 1991. This distinction was retained following reunification as it frequently highlights clear-cut differences of opinion between these two territories.

The abbreviation used to designate the European Union as a whole is "EU15". The abbreviation "DNK" means "do not know".

In the sections devoted to sociodemographic variables, the reader will come across constructed variables, such as education level and income scale.

Given the heterogeneity of the education systems, it was decided to establish subjective education thresholds. The first level is "low", which covers those who left school at or before the age of 15, the second level is "average", which includes those who completed their education between the ages of 16 and 19 and the third level is "high", which covers those who ended their studies after the age of 19.

The same difficulty had to be overcome with regard to income scale. The solution adopted divides the scale into quartiles and groups together the results of each country in a European scale consisting of four levels, "++", "+", "-", and "--".

The references to Split Ballot A and Split Ballot B relate to the fact that the total sample by country was divided into two equal sections which were asked two similar questions, but covering different fields. For example, for Question 2.3, Split Ballot A represents those interviewed with regard to biotechnology whilst Split Ballot B represents those asked the same question with regard to genetic engineering.

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# REPORT

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# 1. Technological progress: is an improvement in our way of life in prospect?

## Overall picture (EU15 and Member States)

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The people interviewed were asked if they thought that their way of life would improve in the next twenty years, would not change or would deteriorate as a result of eight fields where new technologies are currently being developed.

The average used in this section was calculated on a scale of three points ("will improve" = 3, "will not change" = 2 and "will deteriorate" = 1, with a midpoint of 2).

The fields where new technologies are being developed which are likely to have an impact on our way of life and which obtained the highest European averages are:

- telecommunications (2.83),
- information technology (2.79),
- solar energy (2.74),
- the Internet (2.69), and
- new materials (2.68)

These fields are followed by, in this order,

- space exploration (2.51),
- biotechnology (Split Ballot A) (2.37),
- genetic engineering (Split Ballot B) (2.12) and, finally,
- nuclear energy (1.85), the only item with an average below the midpoint.

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In reading the results, it must be remembered that “biotechnology” and “genetic engineering” were not presented as separate items in the same questions put to the sample of Europeans taking part in this survey, but rather as two separate items, with one included in a questionnaire put to half of the sample and the other included in the questionnaire for the remaining half<sup>2</sup>.

As a result, it can be seen that genetic engineering receives less positive feedback than biotechnology.

The national variables are analysed below in the order in which the fields were presented in the questionnaire<sup>3</sup>.

### **Solar energy**

The first field presented to those interviewed was solar energy. The European average of 2.74 shows that, according to the citizens of the European Union, the new technologies developed in this area are quite likely to improve their way of life in the next twenty years.

The average is highest in the Netherlands (2.91), Austria (2.84), Denmark (2.83) and Finland (2.81) and lowest in Greece (2.56), Italy (2.63) and the new Länder (2.67 to give a German national average of 2.72).

### **Information technology**

Information technology achieves a similar, although slightly higher, average: 2.79, which is proof of the population's belief that it is a positive element. We should note the high averages recorded in Spain (2.94), Portugal (2.89), Ireland (2.87) and Italy (2.85). In this case, Denmark has the lowest average (2.63), just below Greece (2.64) and West Germany (2.65 to give a German national average of 2.66).

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<sup>2</sup> In other words, a “Split Ballot”.

<sup>3</sup> The questionnaire may be consulted in the annex.

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### **Biotechnology (Split Ballot A)**

In relation to the two previous items, the average for biotechnology has fallen considerably and is close to the midpoint: 2.37, despite an average of 2.65 in Sweden, 2.64 in Spain, 2.55 in Portugal and 2.51 in Belgium. Greece (1.79), the United Kingdom (2.17) and Italy (2.21) record the lowest averages.

### **Genetic engineering (Split Ballot B)**

With 2.12, genetic engineering has an even lower average. Spain (2.58), Portugal (2.46), Sweden (2.40) and the Netherlands (2.36) helped to raise the average, whilst Greece (1.56), Denmark (1.73), Austria (1.76) and Finland (1.78) did the opposite.

### **Telecommunications**

We must remember that the highest (European) average for this question is in the field of telecommunications: 2.83. Three countries even exceed 2.9 for this item: Spain (2.96), Portugal (2.93) and Ireland (2.92).

The new Länder (2.71 to give a German national average of 2.72), Denmark (also 2.71) and Austria (2.73) are at the bottom of this group. It is interesting to point out that the difference between the various national averages is relatively small (2.71-2.96), and that they are all to be found towards the upper limit.

### **New materials**

New materials obtain a European average of 2.68, thanks in particular to the Netherlands (2.88), Belgium (2.85), France (2.82), the United Kingdom (2.78) and Denmark (2.75).

Again, Greece (2.31), this time followed by Italy (2.46) and Austria (2.59), is more hesitant in this respect. The averages are however still above the midpoint, a result that supports a common view with regard to the positive effects of the development of new technologies in the field of new materials.

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## Space exploration

With 2.51, the European average for space exploration remains above the midpoint, as with the previous items. Spain (2.75), Sweden (2.60), Italy (2.58), the Netherlands (2.56) and Belgium (2.55) record the highest averages in this respect.

The new Länder (2.37 to give a German national average of 2.43) have the lowest average, just below the United Kingdom (2.38), Ireland and Finland (2.40 each). It should be noted that, once again, all the national averages are higher than the midpoint.

## The Internet

The Internet obtains a European average of 2.69 thanks, in particular, to Spain (2.91), Portugal (2.84), Ireland (2.79) and Sweden (2.76). Again, Greece (2.49), this time followed by West Germany (2.55 to give a German national average of 2.56) and Finland (2.62), shows slightly less enthusiasm.

## Nuclear energy

Finally, the lowest average of all, the only average not to reach the midpoint, is recorded for nuclear energy. Only 1.85 was recorded for the EU countries as a whole despite peaks in Spain (2.05), Sweden (2.03), France (2.02) and the United Kingdom (2). Greece (1.18), Austria (1.57) and Denmark (1.64) recorded the lowest averages for this item and by extension the whole of question 2.

## Sociodemographic variables

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As the pattern of the sociodemographic variables is exactly the same for each of the nine items in this question (eight + one, due to the Split Ballot), we will only describe it here once. The rare exceptions are highlighted later, item by item.

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In general, the average is systematically higher among men than among women: a difference of at least four points (cf. questionnaire, item Q.2.4), but sometimes a difference of seventeen points (cf. questionnaire, maximum in item 2.3. Split Ballot B).

It is also clear that although the average falls with age, it increases with both income level and level of education. The very rare exceptions to this are detailed later.

The socio-professional variables reveal that the average is highest among managers and students, two classes which monopolise the top place for the nine items in this question, above self-employed people, the unemployed, manual workers and employees.

The two classes recording the lowest averages are those who stay at home and, more particularly, pensioners.

Moreover, where this variable is of use, those who consider themselves to be most religious ("very religious", just before "extremely religious") appear to be less enthusiastic as regards the development of new technologies in the various fields than those who are anti-religious, agnostic or atheistic (recording a lower average). Finally, the more European citizens discuss modern biotechnology with others, the higher their average.

### **Solar energy**

The only notable exception to the pattern described above is that the average does not fall proportionately with age, but remains stable up to the age of 54 (2.77 for those aged between 15 and 39 and 2.75 for those aged between 40 and 54) before falling for those aged 55 and over (2.68).

### **Information technology**

The variables of religion and an interest in modern biotechnology are of no relevance for this item.

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## **Biotechnology (Split Ballot A)**

The generic pattern of this question<sup>4</sup> applies perfectly here, except for the completely atypical and very high average of 2.54 recorded among those who consider themselves to be “extremely religious”.

## **Genetic engineering (Split Ballot B)**

As far as the variables of sex, age and education level are concerned together with the socio-professional variables, the differences are still slightly more marked here than for the item on biotechnology in Split Ballot A.

However, there are several notable exceptions to the pattern described above. The first of these are the income variables: here, the lowest average is to be found among those with higher average incomes (2.05) whilst the highest average is recorded among the richest of those interviewed (2.18, just above those with lower average incomes with an average of 2.14).

Although the highest average is among anti-religious people (2.36), it should be noted that the lowest average is recorded among those who say they are “not really religious” (2.01).

Finally, the average is exactly the same for people who have never spoken about modern biotechnology, those who have spoken about it once or twice and those who have spoken about it occasionally (2.13 in each case), although it falls significantly among those who have frequently spoken about it (2.01).

## **Telecommunications**

As with the previous item, the only exception in this case is that the average falls significantly among people who have frequently spoken about modern biotechnology.

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<sup>4</sup> Cf. Questionnaire Q.2.

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## **New materials**

Here, the average rises slightly with age up to 54 years, before falling among those aged 55 or over. This is the only exception to the pattern.

## **Space exploration**

We must point out that in this instance the unemployed are in second place with an average of 2.59, below students (2.68) but above managers (2.55), which is a significant exception to the usual response to this question.

Moreover, the average is lowest (2.47) among those who have frequently spoken about modern biotechnology.

## **The Internet**

Again, the lowest average (2.64) is to be found among people who have frequently spoken about modern biotechnology. That is the only exception in this field to the pattern described above.

## **Nuclear energy**

Although the average falls with age, as the pattern above depicts, it does so only slightly up to the age of 39 (from 1.9 to 1.88), before falling more steeply among those over 40 (1.81).

Although the highest average is recorded by the richest people (1.88), the lowest average is to be found among those with higher average incomes (1.78).

Finally, the average is highest for those who have never spoken about modern biotechnology (1.89), compared to 1.8 for the three other classes of the same variable, namely those who have spoken about it once or twice, those who have spoken about it occasionally and those who have spoken about it frequently.



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## Comparison with the results of the 1996 survey

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	Percentage of answers "will improve"	
	1996	1999
<b>Telecommunications</b>	81	81
<b>Information technology</b>	76	79
<b>Solar energy</b>	73	72
<b>The Internet</b>	Not asked	68
<b>New materials</b>	64	63
<b>Space exploration</b>	49	50
<b>Biotechnology (Split Ballot A)</b>	50	45
<b>Genetic engineering (Split Ballot B)</b>	43	37
<b>Nuclear energy</b>	Not asked	28

It can be seen firstly that the order evident in 1996 for the response "will improve" remains the same despite some points being lost or gained in one or other of the fields. More particularly, information technology gains three points and space exploration only one, whilst solar energy loses one point as does new materials. The biggest losers in this new survey are biotechnology, whose "basket" of votes falls by five points, and genetic engineering, which loses six points.

Of the two new fields included in this survey, the Internet is situated from the outset towards the top of the scale, while nuclear energy sinks to the very bottom of this grouping.

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## 2. Modern biotechnology and its implications

We should explain to the reader how this question was approached. First, the people interviewed were asked to say what they thought of when modern biotechnology (including genetic engineering) was mentioned. They were then asked to say if their opinion was positive, negative or neutral in relation to each response provided.

The replies to this first question were reclassified on a European scale into five main categories: "animal cloning and human beings", "scientific research - health - technological development", "genetically modified food", "ethical or philosophical questions" and "the environment". Each of these categories was given the assessment that received most votes (positive, negative or neutral).

### 2.1 Spontaneous associations (EU15 and Member States)

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In response to the question "Could you tell me what comes to mind when you think about modern biotechnology in the broad sense, i.e. including genetic engineering?" 43% of people say "animal cloning and human beings", which is the most popular response, just ahead of "scientific research - health - technological development" (33%), the DNKs (28%) equally placed with "genetically modified food" (also 28%), "ethical or philosophical questions" (16%) and "the environment" (8%).

The response "animal cloning and human beings" is given by 87% of those interviewed in Denmark, 82% in Sweden and 81% in Italy but only by 15% in Portugal and 16% in the United Kingdom.

"Scientific research - health - technological development" is a particularly popular response in Italy (55%), Sweden (50%) and Austria (49%), while "genetically modified food" is often quoted in West Germany (49% to give a German national average of 48%), Italy (30%), a country mentioned for the third time in relation to this question, and Finland (28%).

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Finally, we should underline the high percentage of DNKs in Portugal (64%), Greece (55%), Ireland (40%), Belgium and the United Kingdom (38% each), and Luxembourg (36%).

With regard to the sociodemographic variables, 46% of men and 40% of women mention "animal cloning and human beings". This is the response given by 47% of those aged between 15 and 54 but only 35% of those aged 55 and over and one which increases significantly in line with both income levels and education. The response "scientific research - health - technological development" is given by 36% of men and 29% of women.

Managers and students (55% each) are most likely to mention "animal cloning and human beings", whilst managers (45%) are also more likely than employees (40%) to opt for "scientific research - health - technological development".

Although only 23% of men respond that they "do not know", 32% of women come into this category. The number of DNKs falls with age up to 54 before increasing significantly among those aged 55 and over (36%).

This response is less common as the education level and incomes of those interviewed increase. The people most likely to respond "do not know" are those who remain at home (39%) and pensioners (36%).

Animal cloning and human beings is chosen by 61% of agnostics (highest score) compared to 40% of those considered to be "very non-religious" (lowest score).

Finally, the number of people who mention animal cloning and human beings increases spectacularly in line with the frequency of their discussions on modern biotechnology: only 33% of people who have never spoken about modern biotechnology opt for this response compared to 50% of those who have spoken about it once or twice, 56% of those who have spoken about it occasionally and 61% of those who have spoken about it frequently.

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## 2.2 Mixed opinions (EU15 and Member States)

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As we explained in the introduction to the chapter, the people interviewed were asked whether their opinion with regard to each of the responses given was positive, negative or neutral.

On a scale of three points (positive opinion = 3, neutral opinion = 2 and negative opinion = 1, with a midpoint of 2), the average is again used on the same principle as before for each of the five categories of responses to this question.

Before analysing the national variables, the averages obtained on a European basis for each of these categories are given in decreasing order:

“Scientific research - health - technological development” (2.32) records the best average ahead of “the environment” (2.11), “genetically modified food” (1.78), “animal cloning and human beings” (1.61) and “ethical or philosophical questions” (1.49).

The national variables are next analysed, by category, in the order in which they appeared in the questionnaire.

### **Cloning**

Cloning animals and human beings obtains an average of 1.61 at EU level, thus placing it more on the negative side.

Italy and Sweden (1.82 each), Denmark, and the Netherlands (1.75 each) provide the highest averages whilst France (1.37), Greece and the United Kingdom (1.42 each), and West Germany (1.45 to give a German national average of 1.47) provide the lowest. It is important to note however that none of the national averages reach the “2” mark.

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## **Scientific research - health**

The average is much higher for “scientific research - health - technological development”: 2.32.

We should highlight the high averages in the Netherlands (2.81) ahead of West Germany (2.68 to give a German national average of 2.65), France and Portugal (2.64 each). Nevertheless, the average is low in Austria (1.67), Luxembourg (1.73), Italy (1.82), Denmark (1.87) and Sweden (1.97).

## **Genetically modified food**

Genetically modified food records a European average of 1.78, despite receiving 2.26 in the Netherlands, 2.11 in Belgium and 1.98 in Finland and Sweden. Greece (1.46), Luxembourg (1.60), and Ireland and the United Kingdom (1.61 each) provide the lowest averages here. There is thus a broad difference of opinion throughout the Member States as regards the implications of the use of biotechnology in the production of genetically modified food, with some countries viewing it optimistically, and others pessimistically.

## **The environment**

The environment obtains an average of 2.11 at EU level. It is most popular in West Germany (2.70 to give a German national average of 2.47), the Netherlands (2.58), Finland (2.55) and France (2.54) and least popular in Greece (1.11), the United Kingdom (1.59), Italy (1.61) and Denmark (1.66). The previous observation also applies here with regard to the overall position of the various Member States.

## **Ethical or philosophical questions**

The category involving ethical or philosophical questions records the lowest average of all: 1.49. However, three countries have averages above the midpoint: Luxembourg (2.27), Sweden (2.21) and Austria (2.02).

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Nonetheless, the averages are very low in Ireland (1.16), France (1.25), Finland (1.36) and Belgium (1.39).

## **Sociodemographic variables**

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For the five categories considered here, the average among men is systematically higher than that observed among women. With regard to the education variables, for each of the five categories (with the exception of the first, described below), the average rises as the level of education increases.

As regards the socio-professional variables, students and managers systematically provide the highest average (except for the environment, described below).

Those considered to be anti-religious, non-religious or agnostic provide higher averages than the "extremely religious" or the very religious, who normally have the lowest average.

Finally, those who have spoken frequently or occasionally about modern biotechnology show higher averages than those who have never spoken about it or who have spoken about it only once or twice.

The detailed sociodemographic analysis below of the five categories will therefore only refer to the variables of age and income and to the rare exceptions mentioned above.

### **Cloning**

The average here falls steadily with age. As regards education, the highest average is to be found among those with the best education (1.7) ahead of those with the lowest level of education (1.56) and those who stopped their studies between the ages of 16 and 19 (1.55) in that order. As regards income level, those with the lowest incomes record the lowest average (1.54) and those with lower average incomes record the highest average (1.69).

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### **Scientific research - health**

Of all the age groups, the people aged between 25 and 39 are most likely to support scientific research and health (2.38). The average also rises steadily as incomes increase.

### **Genetically modified food**

Genetically modified food is most likely to be quoted by people aged between 15 and 24 (1.84), followed closely by those aged between 40 and 54 (1.83). In terms of income, those with lower average incomes (1.85) are most likely to mention this aspect.

### **The environment**

People aged between 25 and 39 clearly record the highest average here (2.23). The same is true for those with higher average incomes (2.35) who mention the environment more than all the income classes. There is only one socio-professional exception for Question 3: here the unemployed (2.33) have a higher average than managers (2.3) and employees (2.2).

### **Ethical or philosophical questions**

Young people between 15 and 24 (1.56), followed by those between 25 and 39 (1.55), are far more likely to mention this aspect than the other two age groups: those aged 55 or over (1.45) and those aged between 40 and 54 (1.44).

Moreover, the highest average is to be found among the higher average incomes (1.55) compared to the richest people (1.48), who are well behind with regard to this item.

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### 3. Biotechnology quiz

#### Overall picture (EU15 and Member States)

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The citizens of the fifteen Member States were asked to answer true or false to twelve statements closely related to genetics or biotechnology.

It should be noted that nine of the twelve proposals covered here had already been included in the 1996 survey on biotechnology. The three newcomers are: "The father's genes determine whether or not the child is a girl"; "criminal tendencies are mainly inherited genetically"; and "musical ability is mainly acquired".

#### **There are some bacteria which live on waste water**

83% of Europeans believe that this statement is true. Only 4% believe that it is false.

In four countries, including the three Scandinavian countries, over 90% of people believe that this is true: the Netherlands (98%), Sweden (96%), Denmark (92%) and Finland (91%). The four countries most likely to believe that this statement is false are Germany, Greece, Austria and Portugal (6% each).

#### **Ordinary tomatoes do not contain genes, while genetically modified tomatoes do**

An equal number of people believe that this is true (35%) as those who believe it is false (35%). On a European scale, 30% said they did not know, with higher levels in Portugal (47%), Ireland (41%) and the United Kingdom (40%).

Those in Greece (51%), Germany (41%) and France (40%) are most likely to believe that this statement is true, whilst 60% of those interviewed in the Netherlands, 54% in Sweden, 51% in Denmark and 47% in Finland feel the statement is false.



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## **The cloning of human beings results in perfectly identical descendants**

In the European Union, 64% of the people feel that this statement is true, 17% feel that it is false and 18% “do not know”.

Although many people believe that this statement is true in Sweden (78%), Denmark (76%), Luxembourg (71%), Greece and the Netherlands (70% each), the highest percentage of those who believe that it is false are in the Netherlands (22%), Finland (also 22%), France (21%) and Austria (20%).

The appearance of the Netherlands under both the “true” and “false” responses can be explained of course by the very low, 8%, percentage of people answering “do not know”. This percentage increases to 41% in Portugal, 26% in Ireland and 23% in Italy.

## **If a person eats a genetically modified fruit, their genes could be modified as a result**

Only 24% of the people interviewed believe that this statement is true, compared to 42% who believe that it is false and 34% who do not know.

Nevertheless, 48% of Austrians feel that this statement is true (the only country where “true” is a more popular answer than “false”, 48% compared to 22%), as do 34% of Swedes and 31% of Danes and Greeks.

Those who do not believe this statement form the majority in four countries: the Netherlands (70%), Belgium (54%), Finland and Sweden (52% each). Finally, there are three countries where over 40% of people do not know if the statement is true or false: Portugal (46%), Ireland (45%) and the United Kingdom (42%).

## **The father's genes determine whether the child is a girl**

Of the people interviewed, 44% think that this statement is true, while 29% think that it is false and 26% do not know.

In three countries, over 50% of people feel that this statement is true: Greece, France (51% each) and Ireland (50%), just ahead of Luxembourg, Finland (48%) and the new Länder (also 48%, to give a German national average of 41%).

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The smallest proportion of people believe this statement in the Netherlands (the only country where more people believe it is false (42%) than true (38%)), followed by Denmark and Sweden (38% each), and Finland (35%). Finally, there is still a high percentage of DNKs in Portugal (39%), Spain (32%) and Ireland (31%).

### **The yeast used to make beer contains living organisms**

66% of the Europeans interviewed consider this statement to be true, 12% believe it is false and 23% do not know.

A very high proportion believe that it is true in Denmark (90%), Sweden (89%), the United Kingdom (76%), Germany and Ireland (69% each). The countries most likely to believe that it is false are Greece and Portugal (17% each), Finland (16%), Spain and the Netherlands (15% each). Again, the appearance of the Netherlands for both the "true" and "false" responses can be explained by the very low rate of 19%. This percentage rises to 46% in Portugal, 35% in Spain and 27% in Italy.

### **Down's Syndrome can be detected in the first months of pregnancy**

79% of the people interviewed believe that it is indeed possible to determine whether or not a child will be affected by Down's Syndrome in the first months of pregnancy, while only 6% do not think that this is possible.

In two countries, over 90% answer "true" to this statement - the Netherlands (91%) and Sweden (90%) - just ahead of France (86%) and Denmark (85%). Only in Portugal (14%) do more than one tenth of those interviewed believe that this is false, followed by Belgium (10%) and Luxembourg (8%).

### **Genetically modified animals are always larger than ordinary animals**

Only 28% of the citizens of the European Union answer "true" to this statement whilst 34% believe that it is false. It is however a statement Europeans are not sure of since 38% prefer to answer "do not know".

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Those answering “true” are most common in Greece, where they are the absolute majority (51%), followed by Finland and Sweden (37% each), and Ireland (35%).

Most people answer “false” in the Netherlands (61%), Sweden and Denmark (51% each), Finland (42%) and the former West Germany (42% to give a German national average of 38%).

Nevertheless, for the first time, several countries depart significantly from the European pattern. Indeed, although more people answer “false” than “true” Europe-wide, this is not the case in Luxembourg (where the same percentage answer both) and, more particularly, in six countries where more people answer “true” than “false”: Greece, Ireland, Portugal, Italy, France and Spain.

Again, there are many DNKs in Portugal (50%), followed closely by the United Kingdom (46%) and Ireland (44%).

### **More than half of the genes of human beings are identical to those of chimpanzees**

48% of those interviewed think that this statement is true, while only 15% think that it is false.

Most people feel that it is true in Sweden (73%), followed by Denmark (65%), the United Kingdom (56%) and the Netherlands (55%).

In Finland, 21% believe that this is false, as do 19% in Belgium and Greece.

Finally, there is a large proportion of DNKs in Europe as a whole (37%) with extremely high peaks in Italy (45%), Germany (44%) and Austria (43%).

### **It is impossible to transfer animal genes to plants**

The number of people responding “do not know” are clearly in the majority for this statement (47%), and this percentage forms the majority in Portugal (57%), Spain and Ireland (55% each), and the United Kingdom (51%).

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The number of people answering “true” on a European scale (27%) is similar to those answering “false” (26%). The very low proportion of people answering “do not know” in Sweden (only 20%, the lowest rate in the European Union) means that this country records the highest percentage for both “true” (39%) and “false” (41%).

Finally, there are only three countries where more people answer “false” than “true”: Finland (32% answering “true” compared with 40% answering “false”), France (30% answering “true” compared with 33% answering “false”) and Sweden (39% answering “true” compared with 41% answering “false”).

### **Criminal tendencies are mainly inherited genetically**

This statement is believed to be true by only 29% of the citizens of the European Union whilst 48% believe that it is false and 24% do not know.

However, many people feel that it is true in Greece (42%), Luxembourg (35%) and Belgium (33%), while most feel that it is false in Sweden (68%), Finland (66%), Denmark and the Netherlands (59% each).

Only one country does not follow the European pattern, namely Greece (42% answering “true” with only 41% answering “false”).

Again, there are a high proportion of DNKs in Portugal and Spain (30% each), closely followed by the former West Germany (29% to given a German national average of 27%).

### **Musical ability is mainly acquired**

46% of Europeans believe that this statement is true, whilst 35% believe that it is false and 19% do not know.

The number of those answering “true” is very high in Greece (60%), followed by the United Kingdom (55%), the new Länder (also 55% to give a German national average of only 44%) and France (52%).

Those answering false represent the majority in four countries, including the three Scandinavian countries: Sweden (64%), Finland (62%), the Netherlands (59%) and Denmark (50%).

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But it must be noted in particular, that for the second time, several countries depart significantly from the European average. Indeed, although more people believe that this statement is true than false in Europe as a whole, this is not the case in five countries where more people feel that it is false than true: this involves the four countries which have the highest percentage of people answering "false" (Sweden, Finland, the Netherlands and Denmark), together with Italy (37% answering "true" compared with 39% answering "false").

Again, there is a large percentage of DNKs in Portugal (26%), followed closely by Spain and Italy (24% each).

## **Sociodemographic variables**

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Two paradoxical patterns emerge from the analysis of the sociodemographic variables of the twelve items in this knowledge quiz.

The first pattern, P 1, relates to the following four statements (items 1, 3, 6 and 9 of the questionnaire):

- There are some bacteria which live on waste water;
- The cloning of human beings results in perfectly identical descendants;
- The yeast used to make beer contains living organisms;
- More than half of the genes of human beings are identical to those of chimpanzees.

The second pattern, P 2, relates to the following four statements (items 2, 4, 8 and 11 of the questionnaire):

- Ordinary tomatoes do not contain genes, while genetically modified tomatoes do;
- If a person eats a genetically modified fruit, their genes could be modified as a result;
- Genetically modified animals are always larger than ordinary animals;
- Criminal tendencies are mainly inherited genetically.

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Only the statements in the list do not correspond to either pattern and they will therefore be analysed individually later:

- The father's genes determine whether or not the child is a girl;
- Down's syndrome can be detected in the first months of pregnancy;
- It is impossible to transfer animal genes to plants;
- Musical ability is mainly acquired.

### **Pattern " P 1 "**

For all these items, more people believe that they are true than false and men systematically record slightly higher "true" answers than women.

As far as the age variables are concerned, the level of support for these statements falls systematically among those aged 55 and over. The only exception to this, and it relates to the statement that it is impossible to transfer animal genes to plants, is described below.

The proportion of those answering "true" rises steadily as education and income levels increase. Managers, employees and students record the highest levels, together with self-employed people in some cases.

Those who are "very religious" or "extremely religious" are systematically less likely to answer "true" than agnostics, atheists, the non-religious or the anti-religious.

Finally, the proportion of people answering "true" increases in line with the frequency with which they discuss modern biotechnology.

### **Pattern "P 2"**

Pattern P 2 is a mirror of Pattern P 1. Indeed, in this case, "false" is a more common response than "true". Here, men are slightly more likely to systematically answer "false" than women. There is a steady fall in the level of "false" responses as age decreases, with no exception observed.

The number of those answering "false" rises systematically as education and incomes increase. Managers, employees, students record the highest responses, occasionally the self-employed.

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Those who are “very religious” or “extremely religious” are systematically less likely to answer “false” than agnostics, atheists, the non-religious or the anti-religious. Finally, the proportion of people answering “false” increases in line with the frequency with which they discuss modern biotechnology.

**There are some bacteria which live on waste water**

See Pattern P 1.

**Ordinary tomatoes do not contain genes, while genetically modified tomatoes do**

See Pattern P 2.

**The cloning of human beings results in perfectly identical descendants**

See Pattern P 1.

**If a person eats a genetically modified fruit, their genes could be modified as a result**

See Pattern P 2.

**The father's genes determine whether the child is a girl**

The number of women answering “true” in this case (47%) is higher than that of men (41%). Of all the age groups, those aged between 25 and 39 are most likely to believe that this statement is true (49%). This percentage rises as both incomes and education increase.

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Self-employed people (51% answering “true”) record higher levels than managers (49%) and employees (48%). Agnostics and atheists are most likely to support this statement (51% each), compared with the “extremely religious” and those who are “not really religious” (41% each). Finally, those who have previously discussed modern biotechnology record higher percentages of “true” responses.

### **The yeast used to make beer contains living organisms**

See Pattern P 1. The only exception to Pattern P 1 is the analysis of the age variables which reveals that the intermediate age brackets are most likely to answer “true”: 69% for those between 25 and 39 and 70% for those between 40 and 54, compared with 60% for those between 15 and 24 and 63% for those aged 55 and over.

### **Down’s Syndrome can be detected in the first months of pregnancy**

See the pattern for the statement “The father's genes determine whether or not the child is a girl” which fully applies here.

### **Genetically modified animals are always larger than ordinary animals**

See Pattern P 2.

### **More than half of the genes of human beings are identical to those of chimpanzees**

See Pattern P 1.

### **It is impossible to transfer animal genes to plants**

The “true” and “false” responses are so similar for this statement that the sociodemographic variables do not enable us to draw any conclusions.



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## **Criminal tendencies are mainly inherited genetically**

See Pattern P 2.

## **Musical ability is mainly acquired**

More men (48%) believe this statement than women (44%) and the percentages fall steadily with age.

Those who completed their studies between the ages of 16 and 19 are most likely to answer "true" to this statement (47%) compared with the other education categories, whilst the people with higher average incomes are least likely to support this statement (44%) in comparison with the other income categories.

The unemployed record the highest number of "true" responses (52% answering "true") followed by manual workers and students (49% each). The least likely to answer "true" are the "extremely religious" (38%) and the most likely are agnostics (56%). Finally, people who have frequently discussed modern biotechnology record the highest level of support for this statement (50%) within this variable.

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## Comparison between the results of the 1999, 1996 and 1993 surveys

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As can be seen in the table below, Europeans' knowledge of genetics seems to have improved only slightly in the space of almost three years. The only notable change, the level of correct responses to the statement "The cloning of human beings results in perfectly identical descendants", which records a surprising jump of almost twenty points. Whereas the proportion of incorrect answers remains the same, the number of people answering "do not know" falls by almost half (from 35% to 18%).

Another movement, this time in the opposite direction, should be highlighted. People seem to be more uncertain with regard to the potential of biotechnology, since today more of them believe that a person's genes could be modified by eating a genetically modified fruit.

	Correct			Incorrect			DNK		
	1993	1996	1999	1993	1996	1999	1993	1996	1999
Bacteria	82	83	83	3	4	4	15	13	13
Down's Syndrome	75	81	79	7	7	6	17	12	15
Yeast	67	68	66	9	12	12	24	19	23
Chimpanzees		51	48		14	15		35	37
Fruit		48	42		23	24		29	34
Cloning	32	46	64	18	19	17	50	35	18
Animals		36	34		35	28		30	38
Tomatoes		35	35		30	35		35	30
Gene transfer		27	26		29	27		44	47

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## 4. Perceptions of the various applications of biotechnology

### 4.1 How well known are they? (EU15 and Member States)

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In response to the question "Which of the following applications of biotechnology had you heard of before this interview?", the most common answer was "Using modern biotechnology in the production of foods, for example to give them a higher protein content, to be able to keep them longer or to change the taste": 65%.

This application is followed by, in this order:

- taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests - (56%) (included in the table under "gene transfer"),
- using genetic testing to detect diseases we might have inherited from our parents, such as cystic fibrosis, mucoviscidosis, thalassaemia - *according to the most widely-known example in each country* - (53%) (included under "detecting hereditary diseases"),
- cloning animals such as sheep whose milk can be used to produce medicines and vaccines - (52%) ("cloning animals"),
- cloning human cells or tissue to replace sick cells in a patient which are not functioning properly - (49%) ("cloning human tissue"),
- introducing human genes into bacteria to produce medicines or vaccines, for example to produce insulin for diabetics - (44%) ("human genes in bacteria") and, finally,
- developing genetically modified bacteria to clean spillages of oil or dangerous chemicals - (28%) (included in the table under "developing GM bacteria").

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## **4.2 Are they useful, risky or morally acceptable and should they be encouraged? (EU15 and Member States)**

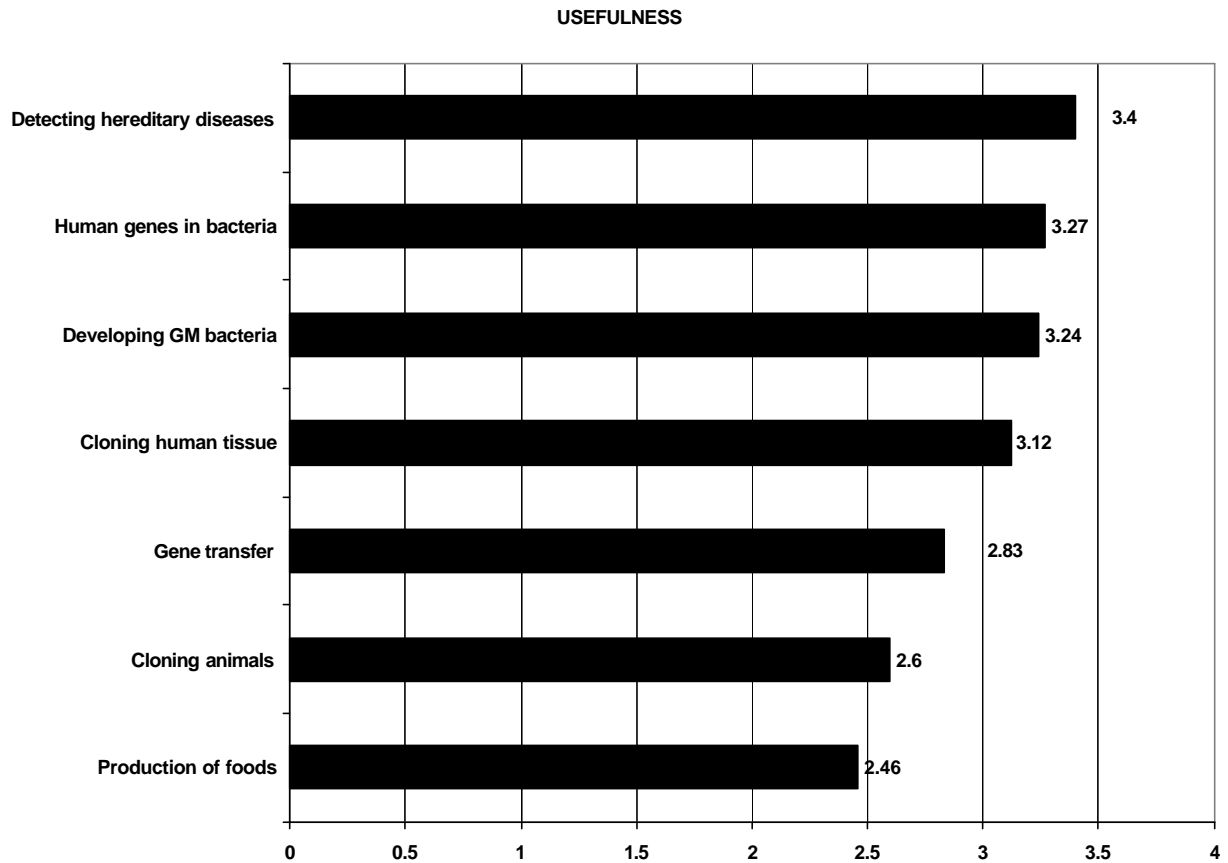
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The various applications reviewed are classified below according to their average for each aspect considered: their usefulness, risks, moral acceptability, and whether or not their development should be encouraged. This average is calculated on the basis of a weighting allocated to each category of answers ("Totally agree" = 4, "Mostly agree" = 3, "Mostly disagree" = 2 and "Totally disagree" = 1, midpoint = 2.5).

### **Useful applications?**

The only application that does not exceed the midpoint of 2.5 in this respect is the use of modern biotechnology in the production of foods, for example to give them a higher protein content, to keep them longer or change the taste. Europeans would instead tend to slightly disagree with this.

The usefulness of all the other applications is either less ambiguous (cloning animals and gene transfer) or better known.



At Member State level, it can be seen that Spain records the highest average (always close to “mostly agree”) for four of the seven applications, namely:

- Using modern biotechnology in the production of foods, for example to give them a higher protein content, to keep them longer or to change the taste – an average of 2.94
- Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests – an average of 3.28
- Cloning human cells or tissue to replace sick cells in a patient which are not functioning properly – an average of 3.45
- Cloning animals such as sheep whose milk can be used to produce medicines and vaccines – an average of 3.10

---

Denmark is at the top of the table for “Introducing human genes into bacteria to produce medicines or vaccines, for example to produce insulin for diabetics” – average of 3.54.

France takes over this position and is just slightly above Denmark with regard to “ Using genetic testing to detect diseases we might have inherited from our parents, such as cystic fibrosis, mucoviscidosis, thalassaemia - *according to the most widely-known example in each country*” – average of 3.55 for France and 3.54 for Denmark.

Germans are most likely to opt for “Developing genetically modified bacteria to clean spillages of oil or dangerous chemicals” – average of 3.45.

At the same time, Greece is situated at the lower limit for four of the seven applications reviewed, namely the production of foods (1.96), cloning animals (2.27), introducing human genes into bacteria (2.97) and cloning human tissue (2.70). Greece’s predominant opinion is close to “mostly disagree” for the first two applications and close to “mostly agree” for the other two.

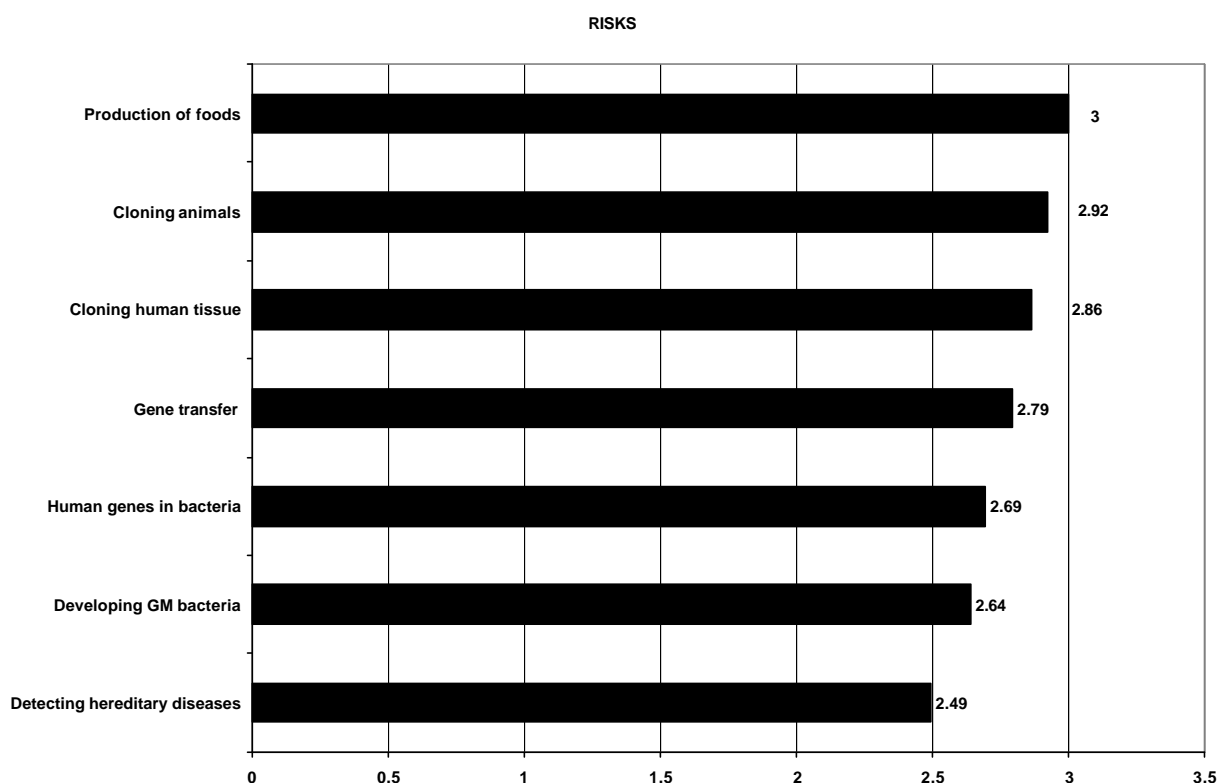
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Austria takes over Greece's position at the bottom of the table for gene transfer – an average of 2.28 (close to “mostly disagree”) – as well as for the detection of hereditary diseases – 3.0 (close to “mostly agree”).

Finally, Luxembourg, together with Greece and Sweden, is at the bottom of the table for the development of genetically modified bacteria to clean spillages of oil or dangerous chemicals – 2.84, 2.90 and 2.92 respectively.

### Risky applications?

Virtually all the applications are situated between the midpoint and “3” (“mostly agree”), so none of them truly escapes the critical eye of Europeans, even the use of genetic testing to detect hereditary diseases.



At Member State level, Luxembourg and France seem to be more aware than others of the risks associated with these applications of biotechnology.

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This is true for gene transfer (Luxembourg, 3.20), using human genes in bacteria (Luxembourg, 3.07, France, 3.04), cloning human tissue (Luxembourg, 3.12, France, 3.09), cloning animals (France, 3.19), detecting hereditary diseases (Luxembourg, 2.93) and developing GM bacteria (France, 2.97, Luxembourg, 2.94).

They are however replaced by Greece with regard to the production of foods (3.28).

We should also note that the average recorded by Denmark is very close to that recorded by France for the detection of hereditary diseases (3.54).

In contrast, the lowest averages are recorded in Finland for the production of foods (2.55), gene transfer (2.41), using human genes in bacteria (Finland, 2.38, together with the new Länder), cloning human tissue (2.55), cloning animals (2.68) and detecting hereditary diseases (Finland, 2.14, together with Greece). The new Länder register the lowest average for the use of GM bacteria.

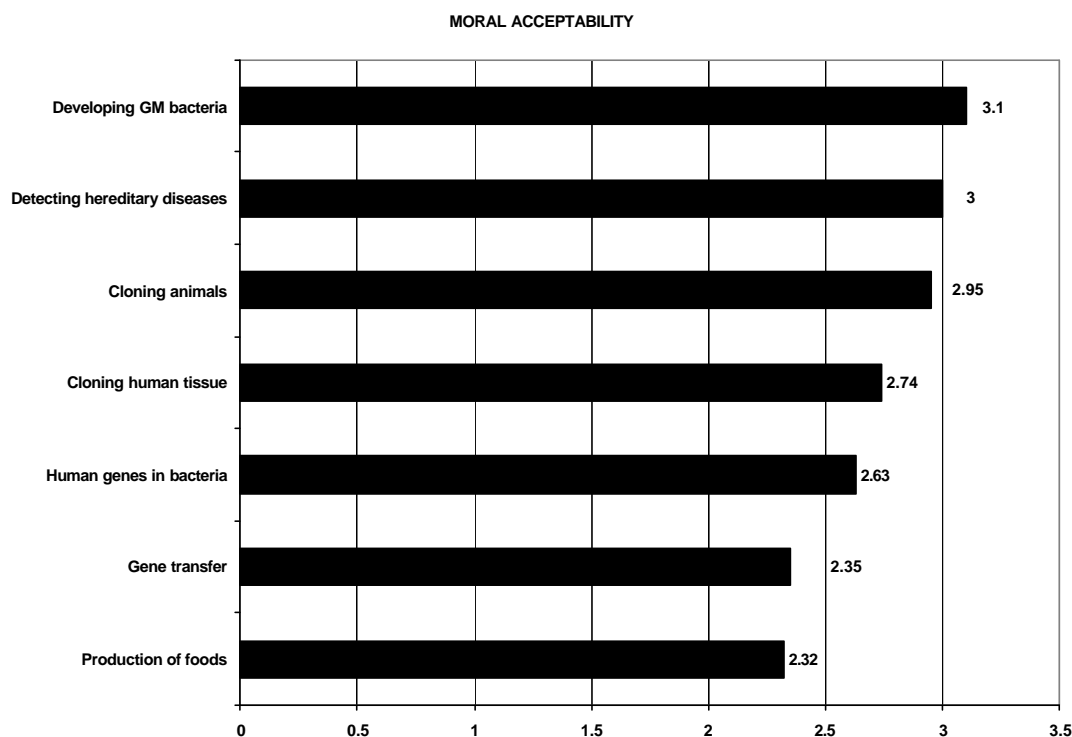
### **Morally acceptable applications?**

When asked to come to a conclusion with regard to the moral acceptability of these seven applications, Europeans demonstrate a somewhat positive attitude towards three of them: detecting hereditary diseases, developing GM bacteria to clean spillages of oil or dangerous chemicals and introducing human genes into bacteria to produce medicines or vaccines.

Two other applications are situated slightly above the midpoint, on the positive side but less marked than those previously mentioned: cloning human tissue and transferring genes from plant species to crop plants to make them more resistant.

The last two applications do not reach the midpoint and are more likely to be considered morally unacceptable: using biotechnology in the production of foods and cloning animals.





At Member State level, Spain is more likely than the other countries to see these applications as morally acceptable.

In fact, it is at the head of the table for six of the seven applications. It loses first position and moves into second for the cloning of human tissue, behind Portugal (3.10; Spain, 3.07), shares first position with Greece and the Netherlands for the detection of hereditary diseases (3.23), and with the new Länder for the development of GM bacteria (3.17), and is closely followed by Denmark and Sweden for the introduction of human genes into bacteria, both of these countries having the same result.

In contrast, Greece records the lowest average (often close to "2", "mostly disagree") for five of the seven proposals. The two exceptions are the transfer of genes from plant species to crop plants, where it is replaced by Austria (2.18; Greece, 2.16), and the detection of hereditary diseases, where it is replaced by Luxembourg (2.93).

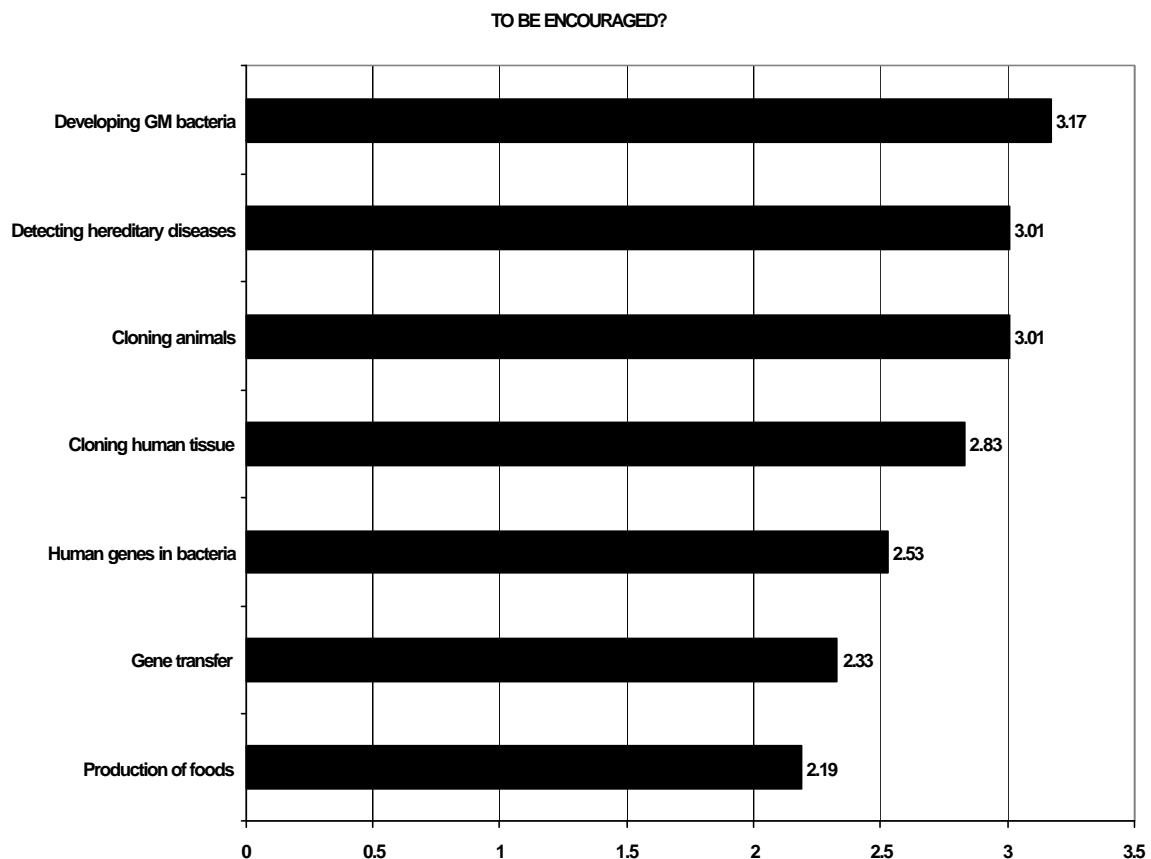
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It is also important to point out that the average achieved for the application of “developing GM bacteria” is close to “3” (2.63), which is equivalent to the response “mostly agree” and the average recorded for the use of human genes in bacteria is 2.55 (near the midpoint).

### **Applications to be encouraged?**

Three of the seven applications receive a somewhat positive score at European level (equal to or above “3”, “mostly agree”), namely the detection of hereditary diseases, the development of GM bacteria and the use of human genes in bacteria to produce medicines or vaccines.

The cloning of human tissue receives similar support (2.83), whilst people are less convinced of the benefits of transferring genes from plant species to crop plants (2.53). The development of animal cloning and the use of biotechnology in food production would be viewed rather negatively by the people of Europe.



At Member State level, Spain systematically registers the highest scores for agreement (close to “mostly agree” irrespective of the application concerned). Here is a breakdown of the results obtained:

<b>Applications</b>	<b>Average</b>
Using modern biotechnology in the production of foods	2.64
Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests	3.02
Introducing human genes into bacteria to produce medicines or vaccines	3.26
Cloning human cells or tissue to replace sick cells in a patient which are not functioning properly	3.20
Cloning animals such as sheep whose milk can be used to produce medicines and vaccines	2.76
Using genetic testing to detect hereditary diseases	3.38
Developing genetically modified bacteria to clean spillages of oil or dangerous chemicals	3.20

Greece records the lowest averages for four of the seven applications under consideration (generally close to “mostly disagree” except for the production of vaccines, cf. table below). The four applications are:

<b>Applications</b>	<b>Average</b>
Using modern biotechnology in the production of foods	1.74
Introducing human genes into bacteria to produce medicines or vaccines	2.67
Cloning human cells or tissue to replace sick cells in a patient which are not functioning properly	2.34
Cloning animals such as sheep whose milk can be used to produce medicines and vaccines	2.0

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Austria takes over its top position with regard to “Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests” – 1.99, while Luxembourg records the highest scores for the detection of hereditary diseases (2.94) and the use of genetically modified bacteria for environmental purposes (2.67). It should be noted that Greece and Sweden follow close behind Luxembourg with regard to the latter application (Greece, 2.66; Sweden 2.63).

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### 4.3 Comparison with the results of the 1996 survey

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Only four of the six applications included in the 1996 study were retained. They are included in the table below, which also shows the combined results of “mostly or totally agree” for 1996 and 1999.

A general comment should be made here: all the percentages relating to the aspects under consideration fell sharply, except for the risks of the various applications. We could put forward the hypothesis that, in relation to the 1996 study, an additional variable was introduced since the people interviewed were asked if they had previously heard of any of the seven applications in question. However, the slight decrease in the scores, relating to the risks involved in the applications, reduces the potential validity of this hypothesis.

#### Useful applications?

Applications	1996	1999	Diff.
Using modern biotechnology in the production of foods	54	43	- 11
Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests	69	55	- 14
Introducing human genes into bacteria to produce medicines or vaccines	80	68	- 12
Using genetic testing to detect hereditary diseases	83	72	- 11

The percentages fell by between 11 and 14 points for all the “comparable” applications. The number of those who agree on the usefulness of the first item no longer even exceeds the 50% mark.

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### Risky applications?

Applications	1996	1999	Diff.
Using modern biotechnology in the production of foods	61	59	- 2
Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests	48	49	+1
Introducing human genes into bacteria to produce medicines or vaccines	47	44	- 3
Using genetic testing to detect hereditary diseases	40	38	- 2

As highlighted in the introduction to this section, the differences here are very slight, irrespective of whether they are positive or negative.

### Morally acceptable applications?

Applications	1996	1999	Diff.
Using modern biotechnology in the production of foods	50	37	- 13
Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests	62	47	- 15
Introducing human genes into bacteria to produce medicines or vaccines	70	57	- 13
Using genetic testing to detect hereditary diseases	74	63	- 11

Again, as for the first of the four aspects considered, there are significant differences here since the percentages fell by between 11 and 15 points.

At present, two applications do not exceed the 50% mark: the use of modern biotechnology in food production and the transfer of genes into crop plants.

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### Applications to be encouraged?

Applications	1996	1999	Diff.
Using modern biotechnology in the production of foods	44	31	- 13
Taking genes from plant species and transferring them into crop plants to make them more resistant to insect pests	58	42	- 16
Introducing human genes into bacteria to produce medicines or vaccines	71	57	- 14
Using genetic testing to detect hereditary diseases	75	63	- 12

The differences here are again remarkable, with all the applications considered falling by between 12 and 16 points. Once again, the first two items do not reach the 50% mark.

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## 5. To what extent are various aspects of animal cloning and modern biotechnology acceptable?

The people of Europe were asked to say if they totally agreed, mostly agreed, neither agreed nor disagreed, mostly disagreed or totally disagreed with two sets of thirteen statements. In fact, this question was divided into a Split Ballot A, i.e. half of those interviewed, who were presented with thirteen statements concerning animal cloning, and a Split Ballot B, i.e. the other half of those interviewed, who were presented with the same thirteen statements but this time concerning genetically modified food (GM food). This question therefore calls for the analysis of twenty-six statements in all.

On a scale of five points ("totally agree" = 5, "mostly agree" = 4, "neither agree nor disagree" = 3, "mostly disagree" = 2 and "totally disagree" = 1, with a midpoint of 3), the average is again used on the same principle as before for each of the thirteen items in this question.

### 5.1 Animal cloning (Split Ballot A) (EU15 and Member States)

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Before analysing the results on a national level, below in descending order are the averages for Europe as a whole for each of the statements concerning animal cloning.

Most support was recorded for the statement "even if animal cloning has advantages, it is basically against nature" (4.24), followed, in order, by these statements:

- animal cloning threatens the natural order of things (4.12),
- animal cloning is simply not necessary (3.85),
- if something went wrong with animal cloning, it would be a global disaster (3.8),
- the idea of animal cloning causes me great alarm (3.73),
- whatever the risks involved in animal cloning, we can avoid them if we really want to (3.15),



- 
- even if it means doing without some of its advantages, cloning should be introduced in a more progressive manner (3.03),
  - taking a decision on the issue of animal cloning is so complicated that it is a waste of time to consult the public on this subject (2.72),
  - of all the risks we have to face at the moment, that of animal cloning is rather insignificant (2.71),
  - animal cloning will benefit many people (2.54),
  - if a majority of people were in favour of animal cloning, it should be permitted (2.5),
  - the risks involved in animal cloning are acceptable (2.28) and, finally,
  - animal cloning presents no danger for future generations (2.19).

Again, the results are analysed at national level below, item by item, in the order in which they appeared in the questionnaire.

### **Animal cloning will benefit many people**

This statement obtains a European average of 2.54, close to both “mostly disagree” and “neither agree nor disagree”.

In Spain (3.14), Sweden (2.87), Denmark (2.75) and Finland (2.71), it is close to the latter response, while in Greece (1.79), Austria (2.21) and Luxembourg (2.23), the average borders the response “mostly disagree”.

### **Taking a decision on the issue of animal cloning is so complicated that it is a waste of time to consult the public on this subject**

The average of all the fifteen Member States increases slightly for this statement: 2.72, an average closer to the opinion “neither agree nor disagree” than the opinion “mostly disagree”.

Four Member States are close to the midpoint (equivalent to “neither agree nor disagree”), namely Spain (3.16), Italy (3.12), Portugal (2.98) and Ireland (2.84). Three others are less in agreement with this statement: the Netherlands (2.28), Belgium (2.44) and France (2.46). The other Member States are situated between these two positions.

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### **Animal cloning threatens the natural order of things**

A high European average is recorded for this statement: 4.12, close to the response “mostly agree”.

The averages recorded in Greece (4.45), Sweden (4.37), Ireland (4.30) and France (4.28) are closest to the European average.

The average is only (slightly) below four in Spain (3.71) and in the new Länder (3.92 to give a German national average of 4).

### **If a majority of people were in favour of animal cloning, it should be permitted**

This statement obtains a European average of 2.5, situated between “mostly disagree” and “neither agree nor disagree”.

Spain (2.97), Portugal (2.90), the new Länder (2.68 to give a German national average of 2.41) and the Netherlands (2.63) have the highest averages, representing a neutral point of view, compared with Austria (2.21), Greece (2.25) and France (2.27), which have the lowest averages, close to “mostly disagree”.

### **Animal cloning is simply not necessary**

This opinion recorded an average of 3.85, close to “mostly agree”.

Greece (4.29), Finland (4.14) Sweden (4.1) and Ireland (4.04) are most likely to agree with this statement, closely followed by the other Member States.

The lowest averages are recorded in Spain (3.59), Portugal (3.74) and the new Länder (also 3.74 to give a German national average of 3.86). Indeed, even these relatively low averages are close to the “mostly agree” response; Europeans thus do not see animal cloning as useful.

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### **The risks involved in animal cloning are acceptable**

The average of all the fifteen Member States falls significantly for this statement – 2.28 – and is around the “mostly disagree” level.

This opinion is very evident in Ireland (2.03), the United Kingdom (2.04), Austria and Finland (2.08 each), but less so in Greece (2.75), Spain (2.74), Portugal (2.61) and the Netherlands (2.42).

### **Whatever the risks involved in animal cloning, we can avoid them if we really want to**

This statement registers an average that is slightly higher than the midpoint: 3.15, which is therefore close to the neutral opinion “neither agree nor disagree” with the views of the Member States spread out to a certain extent.

In fact, while Spain, Portugal (3.56 each), France (3.52) and Luxembourg (3.42) are situated between this neutral point and “mostly agree”, Finland (2.64), Greece (2.66), Austria (2.8) and Denmark (2.87) are situated between the neutral point and “mostly disagree”.

### **Even if animal cloning has advantages, it is basically against nature**

This statement obtains a high European average (4.24), closest to “mostly agree”.

Sweden (4.69), Denmark (4.61), Greece (4.52) and Luxembourg (4.5) record the highest averages, thereby reinforcing their support for this statement.

The countries with the lowest averages are situated around the more moderate “mostly agree”: Spain (3.77), Portugal (4.05) and Italy (4.15).

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### **If something went wrong with animal cloning, it would be a global disaster**

This statement registers an average of 3.8, close to “mostly agree”.

Greece (4.31), Austria (3.93), the United Kingdom (3.91) and Ireland (3.9) have the highest averages whilst Belgium (3.3), the Netherlands (3.39), Spain and Finland (3.62 each) have the lowest, although they are still above the midpoint.

### **The idea of animal cloning causes me great alarm**

The opinion of the fifteen Member States falls very slightly for this statement in relation to the previous one: 3.73 (thus near “mostly agree”).

However, the national variables reveal more marked differences since in this case there are high averages in Denmark (4.07), Greece (4.04), Sweden (4.02) and Ireland (3.93).

Although Belgium once again has the lowest average (3.3), Spain (3.46), Luxembourg (3.58) and West Germany (3.6 to give a German national average of 3.75) are close behind.

### **Animal cloning presents no danger for future generations**

This statement has a low average: 2.19, close to the opinion “mostly disagree”, with a small spread of national results.

Although it reaches 2.59 in Spain, 2.48 in the new Länder (to give a German national average of 2.3), 2.4 in the Netherlands and 2.36 in Portugal, it is below (but very close to) “2” in three countries: Greece (1.86), France (1.93) and Denmark (1.97).

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**Of all the risks we have to face at the moment, that of animal cloning is rather insignificant**

This statement achieves a European average of 2.71, between “mostly disagree” and the neutral opinion “neither agree nor disagree”.

The Netherlands (3.07), Finland (3), Spain (2.96) and Belgium (2.92) record the highest averages, close to the midpoint, while Austria (2.37), Greece (2.48) and the old Länder (2.55 to give a German national average of 2.6), record the lowest, closer to “mostly disagree”.

**Even if it means doing without some of its advantages, cloning should be introduced in a more progressive manner**

Finally, this last statement registers an average of 3.03, almost at the midpoint.

The highest averages are in Ireland and Italy (3.44 each), Spain (3.24), Finland and the United Kingdom (3.16 each), with the lowest in Luxembourg (1.98), Belgium (2.3) and West Germany (2.73 to give a German national average of 2.78). The difference between the highest and lowest averages is fairly small, highlighting the relatively high degree of approval among Europeans as a whole in relation to this statement. Their choice of the midpoint seems to show how difficult it is for them to make a decision in this case.

## **Sociodemographic variables**

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As far as the sociodemographic variables are concerned, two opposing patterns recur. The first pattern, “ P 1”<sup>5</sup> relates to the following statements:

- Animal cloning will benefit many people;
- The risks involved in animal cloning are acceptable;
- Of all the risks we have to face at the moment, that of animal cloning is rather insignificant;

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<sup>5</sup> This is of course in no way related to Pattern P 1 in the “quiz”.

- 
- Even if it means doing without some of its advantages, cloning should be introduced in a more progressive manner.

The second pattern, "P 2", relates to the following statements:

- Taking a decision on the issue of animal cloning is so complicated that it is a waste of time to consult the public on this subject;
- Animal cloning threatens the natural order of things;
- Animal cloning is simply not necessary;
- If something went wrong with animal cloning, it would be a global disaster;
- The idea of animal cloning causes me great alarm.

The other statements, which follow neither pattern, are analysed in detail below.

### **Pattern "P 1"**

*( Note: sex variables are not included in Patterns 1 and 2)*

The average falls systematically with age but rises as the education and income levels of the people interviewed increase. Four socio-professional classes share the first four places for the highest averages: students, managers, manual workers and employees. The four other socio-professional classes record lower averages: self-employed people, the unemployed and, in particular, those who stay at home and pensioners. Those who consider themselves to be "extremely religious", "very religious" or religious record lower averages than agnostics, atheists or the anti-religious.

Finally, it is clear that the averages rise in line with the frequency with which those interviewed have discussed modern biotechnology, (from "once or twice" to " occasionally" to "frequently").

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## **Pattern "P 2"**

*( Note: sex variables are not included in Patterns 1 and 2)*

Pattern P 2 is the complete opposite of P 1. Therefore, the average here increases systematically with age but falls as education and income levels increase. Four socio-professional classes share the first four places for the highest averages: self-employed people, the unemployed and, in particular, those who stay at home and pensioners. The four other socio-professional classes record lower averages: students, managers, manual workers and employees. Those who consider themselves to be "extremely religious", "very religious" or religious record higher averages than agnostics, atheists or the anti-religious. Finally, it is clear that the averages fall among those who have discussed modern biotechnology most frequently ("once or twice", " occasionally" or "frequently").

### **Animal cloning will benefit many people**

The average for men (2.67) is higher than that for women (2.42) – women are therefore a little less likely than men to support this statement. Aside from this, Pattern P 1 applies perfectly here.

### **Taking a decision on the issue of animal cloning is so complicated that it is a waste of time to consult the public on this subject**

The average for men (2.73) is similar to that of women (2.72). Pattern P 2 applies perfectly here.

### **Animal cloning threatens the natural order of things**

The average for men in this case (4.02) is lower than that for women (4.21), women thus adopting a more distinct position than men. Pattern P 2 applies perfectly to this statement.

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### **If a majority of people were in favour of animal cloning, it should be permitted**

The average here is higher for men (2.59) than for women (2.41) - women again proving less likely to support animal cloning.

The average falls somewhat with age (2.69 for those aged 15-24 years, 2.49 for those aged 25-39 years, 2.5 for those aged 40-54 years and 2.41 for those aged 55 years and over).

People who left education at 19 or younger record an average of 2.51 compared with 2.38 for those who continued their studies until over the age of 20. Those with the highest level of education are thus more assertive in their opinion.

The averages are highest for people at both extremes of the income variable (2.59 for the richest and 2.55 for the poorest, compared with 2.5 for higher average incomes and 2.4 for lower average incomes).

Students (2.69) are ahead of the unemployed (2.6) in terms of the highest averages. Those who consider themselves to be extremely non-religious (2.7) have a significantly higher average than the extremely religious (2.17). Finally, the more people discuss modern biotechnology, the lower their average for this statement.

### **Animal cloning is simply not necessary**

Men's average (3.74) is here lower than that of women (3.95) - women adopting, again, a more distinct opinion than that of men (more near to « completely in favour »). Pattern P 2 again applies perfectly for this fifth item.

### **The risks involved in animal cloning are acceptable**

Men's average (2.37) in this case is higher than that of women (2.2), with women closer than men to "mostly disagree". Pattern P 1 applies fully here.



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**Whatever the risks involved in animal cloning, we can avoid them if we really want to**

Men (3.15) and women (3.16) record the same average for this statement.

The lowest average is recorded by people aged between 25 and 39 (3.06) with the highest being recorded by people aged 55 and over (3.22) – both however are close to the midpoint “neither agree nor disagree”.

People who finished their education between the ages of 16 and 19 have a higher average (3.22) than the other two education categories (3.19 for people with the lowest level of education and 3.01 for those with the highest level of education).

Those at the very bottom of the income scale are most likely to support this statement (3.26) compared with those with higher average incomes (2.92). The highest averages are to be found among the unemployed (3.25), closely followed by those who stay at home and manual workers (3.24 each).

Atheists record the highest average in this instance (3.26), compared with the “extremely religious” (3.07). Finally, people who have never spoken about modern biotechnology record the highest average for this variable by far (3.31).

**Even if animal cloning has advantages, it is basically against nature**

Men (4.17) record a lower average here than women (4.31) – women continuing to register more clear-cut positions than men.

The average falls steadily with age and, in a less marked manner, with the level of education. The higher and lower average incomes (4.29) are most likely to support this statement, although the reverse is true for those at the top of the income scale (4.14).

With an average of 4.38, pensioners are most in agreement with this statement, followed closely by those who stay at home (4.3). Agnostics record the lowest average (4.01), compared with those who are extremely or quite religious (4.31 each).

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Finally, the average is lowest for people who have frequently discussed modern biotechnology (4.12, compared with 4.24, 4.25 and 4.26 for the other three categories within this variable).

### **If something went wrong with animal cloning, it would be a global disaster**

Men's average here (3.73) is lower than that of women (3.88) – women again proving that they are more apprehensive than men with regard to animal cloning. Aside from this, Pattern P 2 applies to this statement.

### **The idea of animal cloning causes me great alarm**

Again, the average here for men (3.53) is lower than that for women (3.93), thus confirming the views of women as mentioned earlier. In the same way, Pattern P 2 applies fully here.

### **Animal cloning presents no danger for future generations**

Men's average (2.27) is higher than that of women (2.1), although both are close to “mostly disagree”.

Though the average falls steadily with the level of education, this is not true for age (2.18 for those aged 25-39 and 2.21 for those aged 40-54). It is stable up to the higher average incomes (2.17, 2.16 and 2.17), but suddenly increases among the wealthiest (2.32).

Self-employed people (2.28) are slightly more supportive of this statement than students (2.26) and managers (2.25). The religion variable highlights few differences for this item. Finally, those who have never discussed modern biotechnology record the highest average (2.23), followed closely by those who have discussed it occasionally (2.17)

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**Of all the risks we have to face at the moment, that of animal cloning is rather insignificant**

Men's support for this statement (2.79) is slightly higher than women's (2.63), although both are close to the neutral opinion included in the survey. Pattern P 1 fully applies here.

**Even if it means doing without some of its advantages, cloning should be introduced in a more progressive manner**

Once more, the average here for men (3.10) is higher than that for women (2.97), although again only slightly. Pattern P 1 again applies fully here.

## **5.2 GM Food (Split Ballot B) (EU15 and Member States)**

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As for Split Ballot A, before analysing the national results, here again in descending order are the averages recorded on a European scale for each statement relating to genetically modified food.

There is most support for the statement "even if GM food has advantages, it is basically against nature" (4.08) followed, in order, by these statements:

- GM food threatens the natural order of things (3.96),
- if something went wrong with GM food, it would be a global disaster (3.88),
- GM food is simply not necessary (3.72),
- the idea of GM food causes me great concern (3.57),
- even if it means doing without some of its advantages, GM food should be introduced in a more progressive manner (3.13),
- whatever the risks involved in GM food, we can avoid them if we really want to (3.11),
- GM food will benefit many people (2.73),
- of all the risks we have to face at the moment, that of GM food is rather insignificant (also 2.73),

- 
- if a majority of people were in favour of GM food, it should be permitted (2.73 again),
  - taking a decision on the issue of GM food is so complicated that it is a waste of time to consult the public on this subject (2.6),
  - the risks involved in GM food are acceptable (2.35) and, finally,
  - GM food presents no danger for future generations (2.22).

Again, the results are analysed at national level below in the order in which the statements appeared on the questionnaire.

### **GM food will benefit many people**

This statement has a European average of 2.73, close to the midpoint (but leaning towards “mostly disagree”). Spain (3.07) is the only country where the average is above the midpoint – close to “neither agree nor disagree”.

However, the results recorded in the Netherlands (2.97), Sweden (2.92) and Italy (2.8) are extremely close to the midpoint, which would appear to indicate that Europeans do not feel sufficiently informed about this subject to come to a conclusion. Opinions in Greece (1.79) and Austria (2.34) are closer to “mostly disagree”.

### **Taking a decision on the issue of GM food is so complicated that it is a waste of time to consult the public on this subject**

The average for this statement, 2.6, is between “mostly disagree” and the neutral viewpoint.

Once again, Spain (3.13) is the only country to exceed the midpoint. In this case it is followed by Italy (2.93), Portugal (2.89) and Finland (2.82). These four countries thus have a fairly moderate opinion in this respect.

Least support for this statement is to be found in the Netherlands (2.19), Denmark (2.23) and France (2.31).

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### **GM food threatens the natural order of things**

This statement has a European average of 3.96, close to “mostly agree”.

Nine countries record an average higher than four, including Greece (4.39), Sweden (4.28), Denmark (4.23) and France (4.21). The least support for this statement is to be found in Spain (3.69), the new Länder (3.75 to give a German national average of 3.8) and the Netherlands (also 3.8).

### **If a majority of people were in favour of GM food, it should be permitted**

This statement has an average of 2.73 – closer to the neutral opinion than to “mostly disagree”. Support in Spain (3.05), Portugal (3.01), the United Kingdom (3) and the Netherlands (2.99) is closest to the midpoint. The least support is in Denmark and Greece (2.36 each), as well as Luxembourg (2.37) and France (2.4) – where the dominant opinion is close to “mostly disagree”.

### **GM food is simply not necessary**

With an average of 3.72 (near “mostly agree”), the European Union seems to be against genetically modified food. This opinion is most evident in Greece (4.15), Luxembourg (4.14), Sweden (4.11) and Finland (4.08), and less so in the Netherlands (3.47), Portugal (3.51), Spain and the United Kingdom (3.59 each).

### **The risks involved in GM food are acceptable**

Given a European average of 2.35 (near “mostly disagree”), we should highlight the peaks in Greece (2.81), the Netherlands (2.7), Portugal (2.6) and Spain (2.59). In these countries, the predominant opinions are therefore situated around the midpoint whilst people in Denmark (2.02), in Luxembourg (2.07), in Ireland (2.09) and in France (2.12) are more likely to “mostly disagree”.

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### **Whatever the risks involved in GM food, we can avoid them if we really want to**

This statement has an average of 3.11 at European level – a sign of the uncertainty in Europe in this respect.

Portugal (3.66), Spain (3.46), the Netherlands (3.35) and France (3.31) show most support for this statement, averaging close to “mostly agree”. However, it has least support in Greece (2.76), Denmark (2.82), the United Kingdom (2.83) and Finland (2.87) – although these averages are closer to “neither agree nor disagree” than “mostly disagree”.

### **Even if GM food has advantages, it is basically against nature**

This statement has an average of 4.08 (“mostly agree”) at European level, with a relatively small difference between the countries.

Sweden (4.59), Denmark (4.48), Greece (4.4) and Luxembourg (4.36) are most supportive of this statement, compared with Spain (3.73), Portugal (3.81), the United Kingdom (3.98) and the Netherlands (3.99), the only four countries with an average below four.

### **If something went wrong with GM food, it would be a global disaster**

This statement also has an average close to 4 (3.88).

Three countries are above the “4” mark: Greece (4.26), Luxembourg (4.04) and France (4.01), followed closely by Denmark and Austria (3.97 each). The lowest averages are to be found in the Netherlands (3.57), Finland (3.69), Belgium (3.71) and Spain (3.72) – although all are closer to “mostly agree” than “neither agree nor disagree”.

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### **The idea of GM food causes me great alarm**

The European average for this statement is 3.57 - between the midpoint and "mostly agree".

Denmark (4), Greece (3.98), Sweden (3.87) and France (3.86) have the highest averages – they are closest therefore to approval (at the lower level of support).

However, the averages are lowest in the Netherlands (3.16), the United Kingdom (3.26) and Luxembourg (3.41) and are closer to "neither agree nor disagree".

### **GM food presents no danger for future generations**

Of all the statements put forward, this one records the lowest average since it barely reaches 2.22 – the equivalent of "mostly agree".

The Netherlands (2.55) has the highest average, just ahead of Spain (2.4), the new Länder (2.39 to give a German national average of 2.33) and Portugal (2.34). Four countries have an average of less than two (although they are close to it) : Greece (1.84), Denmark (1.87), Luxembourg (1.92) and France (1.97).

### **Of all the risks we have to face at the moment, that of GM food is rather insignificant**

This statement has a European average of 2.73, between neutral and "mostly disagree".

The Netherlands (3.2), the United Kingdom (2.93), Finland (2.9) and the new Länder (2.89 to give a German national average of 2.76) are neutral on this issue whilst Greece (2.38), Denmark (2.4) and, to a lesser extent, Austria (2.46) are more likely to "mostly disagree".

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**Even if it means doing without some of its advantages, GM food should be introduced in a more progressive manner**

Finally, the European average for this last statement is 3.13, also around the neutral opinion.

In this case, Italy (3.45), Ireland (3.42), the United Kingdom (3.37), the Netherlands and Portugal (3.19 each) record most support, verging towards “mostly agree”.

Nevertheless, the lowest scores for this statement are to be found in Luxembourg (2), Belgium (2.4) and, to a lesser extent, Denmark (2.7) – close to “mostly disagree”.

We cannot dispel the ambiguity in the interpretation of this position since it could mean either “no, GM food should be introduced more rapidly”, or “no, GM food should not be introduced”.

## **Sociodemographic variables**

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### **GM food will benefit many people**

Men have a higher average here (2.85) than women (2.61) – which signifies that they have a less distinct opinion on the subject. Just as with the statement “animal cloning will benefit many people” (cf. Split Ballot A), Pattern P 1 also applies here.

### **Taking a decision on the issue of GM food is so complicated that it is a waste of time to consult the public on this subject**

A slight difference separates men (2.62) and women (2.59). The upper and lower age brackets have the highest averages in this instance (2.73 for those aged 55 and over and 2.59 for those aged between 15 and 24) and therefore find it more difficult to form a definite opinion on this subject.



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The average falls steadily in line with a decrease in education and income levels, thus moving away from the midpoint. Pensioners (2.78) and those who stay at home (2.68) record the highest averages.

People who consider themselves to be extremely religious (3.12) record significantly higher averages than atheists (2.32), the first category having a neutral opinion and the second more likely to “mostly disagree”.

Finally, those who have spoken occasionally about modern biotechnology (2.37) show least support for this statement, followed closely by those who have spoken about it frequently (2.44).

### **GM food threatens the natural order of things**

A slightly lower average here is recorded among men (3.86) than women (4.05). Pattern P 2 applies for this item.

### **If a majority of people were in favour of GM food, it should be permitted**

Once more, the average for men (2.82) is slightly higher than that for women (2.64).

Although there is most support for this statement among those aged 15-24 years, the average is lowest among those aged 40-54 years, thus indicating stronger opposition. People who have completed their studies between the ages of 16 and 19 record the highest average of the education categories (2.75), indicating a greater degree of uncertainty in relation to this question.

The average increases with the level of income of those interviewed. The unemployed (2.87), students (2.85) and manual workers (2.83) record the highest averages (closest to the neutral response).

Those who are “not really religious” have the highest average (2.88) compared to agnostics (2.6). Finally, the average falls as the frequency of conversations on modern biotechnology increases.

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### **GM food is simply not necessary**

There is a considerable difference between the average for men (3.61) and for women (3.82), although both groups are likely to “mostly agree”. Pattern P 2 can be applied fully here except with regard to the income variables. In fact, the two highest averages are to be found among those with the lowest incomes (3.84) and those with higher average incomes (3.81).

### **The risks involved in GM food are acceptable**

The average for men here (2.47) is higher than that for women (2.23), although their responses are both close to “mostly disagree”.

As with the equivalent statement in Split Ballot A (the risks involved in cloning are acceptable), Pattern P 1 also applies perfectly here, except with regard to the education variables, since there is least support for this statement among people who have completed their studies between the ages of 16 and 19 (2.31).

### **Whatever the risks involved in GM food, we can avoid them if we really want to**

Men (3.14) are only slightly ahead of women (3.08) in this respect, and their responses are closest to the neutral “neither agree nor disagree”. The average falls with both age and the level of education. The lower average incomes (3.16) record the highest average contrary to the higher average incomes (3.04). Manual workers (3.23) and students (3.21) have the highest averages among the socio-professional categories.

People who are “extremely religious” show least support for this statement (2.95), compared to the “very non-religious” (3.24). However, we must not lose sight of the fact that the opinions expressed by these two groups are all close to the midpoint. Finally, the average falls as the frequency with which those interviewed have discussed modern biotechnology increases.

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### **Even if GM food has advantages, it is basically against nature**

Men have a slightly lower average in this instance (3.97) than women (4.17), although both responses are close to “mostly agree”. Pattern P 2 applies fully here.

### **If something went wrong with GM food, it would be a global disaster**

Again, men have a somewhat lower average (3.81) than women (3.95), although their respective answers are very close to “mostly agree”. Pattern P 2 also applies for this statement. The only exception to Pattern P 2 is the high average (and therefore stronger opinion) recorded among those who have frequently discussed modern biotechnology (3.93).

### **The idea of GM food causes me great alarm**

Men's average here (3.39) is lower than that of women (3.74), the latter expressing greater fear in this respect. Pattern P 2 applies here without any exception.

### **GM food presents no danger for future generations**

The average in this instance for men (2.3) is slightly higher than that for women (2.15), although both scores correspond to “mostly disagree”. Although the average falls steadily with age, it does so less distinctly with the level of education. The extremes of income show most support for this statement (2.52 for the wealthiest and 2.24 for the poorest). Students (2.37) are slightly more in agreement with the statement than the unemployed (2.33) and manual workers (2.32).

Agnostics (2.38) record the highest average here, compared with those who are “quite religious” (2.18). Finally, those who have never discussed modern biotechnology are most likely to disagree with the statement within that variable(2.3).

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**Of all the risks we have to deal with at the moment, that of GM food is rather insignificant**

The average for men in this case (2.84) is somewhat higher than that for women (2.61), although both sets of answers approach the neutral position. Pattern P 1 applies here, despite two exceptions: people having completed their studies between the ages of 16 and 19 record the highest average (2.75), and although the average increases substantially with income as in Pattern P 1, there is one minor reversal: 2.72 for the poorest people, 2.78 for the lower average incomes and 2.69 for the higher average incomes.

**Even if it means doing without some of its advantages, GM food should be introduced in a more progressive manner**

Finally, the average for men (3.21) is for the last time higher than the average for women (3.07), although both sets of responses are close to "neither agree nor disagree".

Pattern P 1 applies here with one exception: those who have discussed modern biotechnology "occasionally" record the highest average within this variable (3.17).

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## 6. Future attitudes

### Overall picture (EU15 and Member States)

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Europeans were asked whether they mostly agreed or mostly disagreed with nine proposals set out below. It should be noted that the order of these items was alternated when the suggestions for possible attitudes were read out to those interviewed.

We should point out initially that although the “do not know” rate varies for the general average according to the proposals, it is systematically highest in five countries: Portugal, Italy, Spain, Ireland and the United Kingdom. Having stressed this, the analysis that follows will therefore not concentrate on the DNK rate since the pattern is exactly the same for each item.

#### **I would buy genetically modified fruit if it tasted better**

22% of the people interviewed are most likely to agree with this proposal, compared to 66% who do not share this opinion. The DNK rate is only 11% for this statement.

In only three countries do at least a quarter of the population respond “mostly agree”: the Netherlands (30%), Germany (27%) and the United Kingdom (26%).

On the other hand, four countries reach and exceed the three-quarter mark for “mostly disagree”: Greece (88%), Denmark (77%), Luxembourg (76%) and Austria (75%).

#### **I would pay more for non-GM food**

53% of Europeans “mostly agree” with this statement and 36% “mostly disagree”, whilst 11% again “do not know”. Those most likely to agree are Greece (83%), Denmark (74%), Sweden (69%) and Luxembourg (67%). However, the highest scores for “mostly disagree” are to be found in the United Kingdom (51%), Belgium (44%) and the Netherlands (43%). We should point out that the British are the only people to record a higher score for “mostly disagree” (51%) than “mostly agree” (40%).

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### **I would sign a petition against biotechnology**

This statement divides the people of the European Union: 39% are more likely to agree, compared to 38% who are more likely to disagree, with a higher DNK rate than for the other statements (23%).

66% mostly agree in Greece, 51% in Austria, 46% in France and 45% in the former West Germany (to give a German national average of 44%). However, the majority are likely to disagree in the Netherlands (51%), followed by Sweden (50%), Denmark and Finland (47% each).

### **I would be willing to participate in public debates or hearings concerning biotechnology**

Exactly the same percentage of those interviewed opt for “mostly agree” or “mostly disagree” in relation to this statement (41%), with 17% who “do not know”.

The response “mostly agree” is chosen by the absolute majority in Greece (55%), Austria (54%), Denmark (53%), France (51%) and the new Länder (51% to give a German national average of 50%). The response “mostly disagree” has very high scores in the Netherlands and Sweden (62% each), followed by Belgium (59%), Spain (52%) and Finland (47%).

### **I would take time to read articles or watch television programmes on the advantages and disadvantages of the advances in biotechnology**

72% of those interviewed say that they “mostly agree” with this proposal, compared to 19% who “mostly disagree” and only 9% who “do not know”.

People are most likely to agree with this in Denmark and Sweden (83% each), France (82%) and Luxembourg (80%), whilst they are most likely to disagree in Spain (27%), Portugal (26%), Belgium (24%) and Greece (23%).

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### **I feel that I am adequately informed on biotechnology**

The reverse is true for this statement: only 11% say that they “mostly agree” whilst 81% are likely to disagree, with 9% unsure either way.

Nonetheless, the response “mostly agree” is chosen by 20% in the Netherlands, 19% in Austria, 15% in Denmark and 14% in Luxembourg. However, the response “mostly disagree” records peak scores in Sweden (96%), France and Finland (88% each), and Greece (87%).

### **I would be willing to buy cooking oil containing a little genetically modified soya**

Only 22% respond “mostly agree” to this statement, compared with 62% who “mostly disagree” and 16% who “do not know”.

The Netherlands (37%), Denmark (32%), Finland and the United Kingdom (27% each) are most likely to agree with the statement.

In four countries, more than two thirds of those interviewed are likely to disagree: Greece (88%), France (71%), Luxembourg (70%) and Sweden (67%).

### **If all traces of genetic modification were eliminated from GM sugar cane, I would be happy to eat this sugar**

33% of those interviewed “mostly agree” with this statement, 42% “mostly disagree” and 25% are unsure.

Those most likely to agree are in Sweden (51%), the United Kingdom (46%), the Netherlands (44%) and Denmark (41%).

In four countries, the absolute majority is most likely to disagree with this statement: Greece (62%), Finland (56%), Luxembourg (52%) and Austria (51%).

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## **I would be willing to eat the eggs of hens fed on GM maize**

Finally, 19% of those interviewed “mostly agree” with this last statement, whilst 66% “mostly disagree” and 15% “do not know”.

The Netherlands (33%), Sweden (27%), Denmark and Finland (25% each), and the United Kingdom (23%) are most likely to agree, whilst Greece (85%), followed by France and Luxembourg (77% each), and Austria (72%) are most likely to disagree.

## **Sociodemographic variables**

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Aside from the sex and age variables, which will be analysed in detail item by item, a recurring pattern emerges for seven of the nine statements on future attitudes.

These seven proposals are as follows:

- I would buy genetically modified fruit if it tasted better;
- I would be willing to participate in public debates or hearings concerning biotechnology;
- I would take time to read articles or watch television programmes on the advantages and disadvantages of the advances in biotechnology;
- I feel that I am adequately informed on biotechnology;
- I would be willing to buy cooking oil containing a little genetically modified soya;
- If all traces of genetic modification were eliminated from GM sugar cane, I would be happy to eat this sugar;
- I would be willing to eat the eggs of hens fed on GM maize.

The two proposals which do not follow this pattern and which will therefore each be analysed below in detail are as follows:

- I would pay more for non-GM food;
- I would sign a petition against biotechnology.



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## **Pattern of attitudes**

*( Note: the pattern described here does not relate to the sex and age variables)*

For the seven items concerned, the percentages for “mostly agree” increase steadily in line with the level of income and education.

Students, managers and often employees are more likely to respond “mostly agree” than the other socio-professional categories. The “extremely religious”, “very religious” and religious are much less likely to respond “mostly agree” than the non-religious, the anti-religious, agnostics or atheists.

Finally, without any exception for the seven items concerned, the more frequently people discuss modern biotechnology, the more likely they are to say that they “mostly agree”.

## **Exceptions to the Pattern of attitudes**

### **I would buy genetically modified fruit if it tasted better**

25% of men compared with 19% of women “mostly agree” with this statement, a response that falls as the age of those interviewed rises. Apart from this, the pattern described above applies fully.

### **I would pay more for non-GM food**

50% of men and 56% of women “mostly agree” in this case.

People aged between 40 and 54 are at the top of the scale here among the age categories (56% “mostly agree”) followed by those aged 55 and over (55%). Although those with the highest level of education are most likely to support this statement, so too are those with lower and higher average incomes (56% “mostly agree”).

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Among the socio-professional classes, the highest rates for “mostly agree” are to be found among those who stay at home (57%), self-employed people (56%) and managers (55%). The religion variables are inconclusive for this item, while those who have spoken occasionally about modern biotechnology are at the top of the scale for this variable (57%).

### **I would sign a petition against biotechnology**

35% of men “mostly agree” with this statement but this percentage rises to 43% among women.

The level of support for this statement rises steadily with age, but falls, first a little and then significantly, with the level of income and education. Among the socio-professional classes, the greatest support is from those who stay at home (46%), the unemployed and pensioners (42% each).

The very religious are most in agreement with this statement (44%), compared with agnostics (32%), whilst support increases in line with the frequency with which the people interviewed have discussed modern biotechnology.

### **I would be willing to participate in public debates or hearings concerning biotechnology**

44% of men compared with 39% of women opt for “mostly agree” and this response is most frequent among people aged between 25 and 39 (46%). Aside from this, the generic pattern described above applies fully here.

### **I would take time to read articles or watch television programmes on the advantages and disadvantages of the advances in biotechnology**

73% of men compared with 70% of women opt for “mostly agree” in this instance, a response that is once again most common among those aged between 25 and 39 (76%). Aside from this, the generic pattern described above again applies fully here.

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### **I feel that I am adequately informed on biotechnology**

13% of men compared with only 9% of women agree with this statement while those most likely to agree with it are in the intermediate age categories: 12% for people between the ages of 25 and 54. Apart from this, the generic pattern applies in relation to the other sociodemographic variables.

### **I would be willing to buy cooking oil containing a little genetically modified soya**

26% of men here compared with 18% of women opt for “mostly agree”, a response which is less and less popular as the age of those interviewed increases. The generic pattern applies as far as the other variables are concerned.

### **If all traces of genetic modification were eliminated from GM sugar cane, I would be happy to eat this sugar**

35% of men compared with 32% of women agree with this statement while those also most likely to agree with it are aged between 25 and 39. For the other variables, the generic pattern serves as a reference.

### **I would be willing to eat the eggs of hens fed on GM maize**

24% of men compared with 15% of women “mostly agree” with this statement, a response which falls steadily as the age of those interviewed increases. The generic pattern again applies fully.

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## 7. Are the protagonists well perceived?

### Overall picture (EU15 and Member States)

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Europeans were asked if they thought that the groups of people and other protagonists involved in the various applications of modern biotechnology and genetic engineering did good work for society.

We should once more point out that although the DNK rate varies for the general average according to the groups put forward, it is systematically highest in the same five countries as mentioned before: Portugal, Italy, Spain, Ireland and the United Kingdom. Again, we will not focus on an analysis of the “do not know” responses, since the pattern is exactly the same for each item.

### The newspapers and magazines which report on biotechnology

The newspapers and magazines which report on biotechnology do good work for society according to 59% of Europeans, while 18% of them think the opposite and 23% are unsure.

In four countries, more than three-quarters of those interviewed feel that “they do good work for society”: the Netherlands (92%), Finland (86%), Greece (80%) and Austria (75%).

Those most likely to answer “they do not do good work for society” are the United Kingdom (30%), Sweden (27%), France (25%) and Ireland (22%).

### The industry developing new products through the use of biotechnology

Only 30% of Europeans believe that the industry developing new products through the use of biotechnology does good work for society, compared to 38% who believe the opposite and 32% who do not know.

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The countries most likely to believe “that it does do good work for society” are Finland (52%), the Netherlands (50%), the new Länder (39% to give a German national average of 37%) and Belgium (38%).

On the other hand, the countries which believe “that it does not good work for society” are Greece and Sweden (58% each), France (51%) and Denmark (47%).

In addition, six countries (the Netherlands, Finland, Portugal, Belgium, Germany and Spain) do not follow the pattern for EU15. Indeed, they are more likely to state that “it does good work for society” than “it does not do good work for society”.

### **The ethics committees responsible for the moral aspects of biotechnology**

These ethics committees do good work for society as far as 53% of those interviewed are concerned, compared with 18% who believe the opposite and 29% who are unsure.

These committees receive most support in the Netherlands (82%), Finland (81%), Greece (75%) and Denmark (70%) whilst the countries most likely to say that “they do not do good work for society” are France (23%), Ireland and the United Kingdom (21% each), and Italy (20%).

### **The consumer organisations which check biotechnology products**

According to 70% of Europeans, these organisations do good work for society. Only 12% believe the opposite whilst 19% cannot decide.

They receive most support in the Netherlands (96%), Finland (91%), Greece (89%) and Denmark (83%). In no country is the opposite response, “they do not do good work for society”, supported by at least one fifth of those interviewed, despite averaging 19% in Ireland, 18% in Luxembourg, 16% in the United Kingdom and 15% in Italy and Sweden.

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## **The environmental protection organisations campaigning against biotechnology**

According to 58% of the people interviewed, these organisations do good work society, whilst 18% feel that they do not (24% “do not know”).

Greece (86%), followed after a considerable gap by Denmark and Austria (67% each), France (66%) and Finland (65%) are most likely to support these organisations.

There are only three countries where more than one fifth of the population believes that “they do not do good work for society”: Sweden (25%), Belgium and the Netherlands (21% each).

## **Our government which regulates biotechnology**

45% of EU citizens believe that our government does good work for society, insofar as the regulation of biotechnology is part of its remit, compared with 29% who think the opposite and 26% who are unsure.

There are spectacular differences in the national variables with regard to the percentages who respond “it does good work for society”, since the scores for this response are 88% in the Netherlands, 80% in Greece and Finland, before falling to 65% for the fourth country in this classification, Austria (65%), which precedes Portugal (53%) and then Belgium (51%).

The countries most likely to respond “it does not do good work for society” are France (39%), Sweden and the United Kingdom (38% each), Denmark (35%) and Luxembourg (31%).

Finally, only the United Kingdom does not fit in with the resulting general average. Indeed, it is the only country where the response rate for “it does good work for society” (34%) is lower than that for “it does not do good work for society” (38%).

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### **The companies responsible for food safety**

These companies do good work for society according to 59% of European citizens. Only 21% believe that the opposite is true whilst 20% do not know.

They receive most support in the Netherlands (93%), Finland (89%), Greece (87%) and Austria (75%). On the other hand, there are only four countries where more than a quarter of those interviewed support the statement "they do not do good work for society": France (35%), Sweden (34%), Ireland (30%) and Luxembourg (29%).

### **The farmers who decide which types of plants to grow**

According to 55% of those interviewed, farmers do good work for society; 20% believe that the opposite is true and 25% are unsure.

Greece (86%), Finland (77%), Austria (71%) and the new Länder (69% to give a German national average of 63%) are most supportive of farmers. There are only three countries where more than a quarter of the people interviewed do not believe that the farmers' work is beneficial: Sweden (36%), Ireland (29%) and France (27%).

### **The churches which give opinions on biotechnology**

Only 33% of Europeans believe that churches giving opinions on biotechnology are benefiting society, whilst 31% believe the opposite and 35% are undecided.

The countries most likely to believe that "they do good work for society" are Greece (80%), Austria (50%), Portugal (48%) and Finland (46%). On the other hand, those which believe that "they do not do good work for society" are Belgium and France (44%), Sweden and Luxembourg (39%), and Denmark (38%).

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We should point out, in particular, that eight countries (Sweden, the United Kingdom, Denmark, Ireland, Finland, Belgium, Luxembourg and Spain) do not fit in with the general average. Indeed, they are less likely to respond “they do good work for society” than “they do not do good work for society”.

### **The doctors who monitor the influence of biotechnology on health**

Finally, doctors do good work for society according to 69% of European citizens. Only 11% disagree with this whilst 20% are undecided.

They receive most support in Greece and the Netherlands (95% each), Finland (92%), Austria (83%) and Denmark (79%).

There is not a single country where over one fifth of those interviewed respond that these doctors “do not do good work for society”, although this statement is most popular in Ireland (19%), the United Kingdom (16%), France (15%), Luxembourg and Sweden (14% each).

### **Sociodemographic variables**

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Apart from the sex and age variables, which will be analysed in detail group by group, there is a recurring pattern for eight of the items.

They are as follows:

- The newspapers and magazines which report on biotechnology;
- The industry developing new products through the use of biotechnology;
- The ethics committees responsible for the moral aspects of biotechnology;
- The consumer organisations which check biotechnology products;
- Our government which regulates biotechnology;
- The companies responsible for food safety;
- The farmers who decide which type of plants to grow;
- The doctors who monitor the influence of biotechnology on health.



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The two items which do not follow this pattern, and which will therefore be analysed in detail individually, are:

- The environmental protection organisations campaigning against biotechnology,
- The churches which give opinions on biotechnology.

### **Pattern of protagonists**

*( Note: the pattern described here does not relate to the sex and age variables)*

For eight of the groups proposed, support increases steadily with both income and education.

Students, managers and often employees, followed by self-employed people and manual workers (mainly in this order) are more likely than the other socio-professional categories to opt for “they do good work for society”.

People who are “extremely religious”, “very religious” or “religious” are much less likely to say “they do good work for society” than the “extremely non-religious”, the anti-religious, agnostics or atheists.

Finally, for all eight items, the more the people have discussed modern biotechnology, the more likely they are to respond “they do good work for society”.

We should remember that the pattern for protagonists acts as a reference here. Any exceptions are mentioned item by item in the analysis below.

### **The newspapers and magazines which report on biotechnology**

60% of men and 57% of women believe that “they do good work for society”. Support for this group decreases as the age of those interviewed increases.

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### **The industry developing new products through the use of biotechnology**

33% of men and 27% of women believe that “they do good work for society”. Once again, support for this industry decreases as the age of those interviewed increases.

There is only one exception to the pattern for this group: the inversion between the lower average incomes (33% believe that “they do good work for society”) and higher average incomes (only 32%).

### **The ethics committees responsible for the moral aspects of biotechnology**

53% of both men and women believe that these committees “do good work for society”. In addition, those aged between 25 and 39 are most likely to support them (56% respond that “they do good work for society”) compared with those aged 55 and over (only 49%).

### **The consumer organisations which check biotechnology products**

71% of men and 69% of women support the work of these organisations. Again, those between the ages of 25 and 39 record the highest percentages of the age categories (73% feel that “they do good work for society”) with those over 55 once more recording the lowest percentages (only 66%).

### **The environmental protection organisations campaigning against biotechnology**

We should point out that the generic pattern does not apply in this case. 58% of men and 59% of women feel that “they do good work for society”. Within the age categories, those aged between 40 and 54 record the highest scores (61% support the work of these organisations) with those over 55 again demonstrating least support (only 56%).

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Although support for these organisations increases with the level of education, the higher average incomes are most likely to state that “they do good work for society” (65%), in contrast to those with the lowest incomes (only 58%). Support is also greatest among manual workers (61%) followed closely by managers (60%).

The religion variables are not very conclusive here. Finally, support for these organisations is most evident among those who have “occasionally” discussed modern biotechnology (64% respond that “they do good work for society”).

### **Our government which regulates biotechnology**

46% of men and 44% of women believe that the government’s work benefits society.

As far as the age variable is concerned, those between the ages of 25 and 54 show greatest support (46%) in contrast once more to those over 55 (only 43%). Again, the religion variables are not at all conclusive.

### **The companies responsible for food safety**

58% of men and 59% of women feel that “they do good work for society”, although support for them decreases as the age of the people interviewed increases. Again, the religion variables are inconclusive.

### **The farmers who decide which types of plants to grow**

55% of both men and women believe that the farmers’ work benefits society. Once again, support falls steadily as the age of those interviewed rises. There is only one exception to the pattern for this group: the inversion between the higher average incomes (60% believe that “they do good work for society”) and the highest incomes (only 59%).

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## **The churches which give opinions on biotechnology**

As with the environmental protection organisations, the generic pattern does not apply in the case of churches.

32% of men and 35% of women believe that this work is good for society. For the age variable, there is a new development here: support for the work of the churches actually increases steadily in line with the age of those interviewed.

Although the number of people stating that “they do good work for society” decreases in line with their level of education (which is also a new development), the higher average incomes are most likely to support this statement (39%) in contrast to the lowest and highest incomes (only 34% each). Self-employed people, pensioners and those who stay at home all demonstrate most support among the socio-professional categories (37% in each category feel that “they do good work for society”).

The anti-religious (only 14%), atheists (20%) and agnostics (21%) record much lower support for the work of the churches than the extremely religious (50%) and the very religious (49%).

Finally, the more often those interviewed have discussed modern biotechnology, the more likely they are to state that “they do good work for society”.

## **The doctors monitoring the influence of biotechnology on health**

69% of men and 68% of women feel that “they do good work for society”. As the age of those interviewed increases, support for the work of doctors decreases. There is one exception to the generic pattern: those who have “occasionally” spoken about modern biotechnology are most likely within this variable to believe that “they do good work for society” (75%).

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## 8. Which source(s) of information do Europeans trust?

Europeans were asked to say which of twelve possible sources of information on modern biotechnology they trusted most (Cf. Questionnaire Q.9.a). They were then asked to name the other sources they trusted (Q.9.b).

### 8.1 The source Europeans trust most (EU15 and Member States)

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Of all the sources of information suggested, the consumer organisations record the best result (26%), just ahead of the medical profession (24%) and environmental protection organisations (14%).

These three sources of information were a great deal more popular than universities (7%), the responses “none of the sources suggested” or “do not know” (6% each), television and newspapers (4%), international institutions (also 4%), animal protection organisations (4% once again), farmers’ associations (3%), national public authorities (also 3%) or religious organisations (2%).

The other suggestions are below one half of a percent.

Although consumer organisations are the most popular in terms of the general European average, this is not the case in eight countries.

Belgium, Spain, Ireland, Austria, Portugal, Finland and the United Kingdom, i.e. seven countries, put this in second position, opting instead for “the medical profession”.

The only atypical country is Greece since it puts “consumer organisations” in third position with only 11%, behind the medical profession (33%) and environmental protection organisations (12%).

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Consumer organisations are most popular in the Netherlands (36%), France (34%), the new Länder (34% to give a German national average of 29%) and Denmark (31%).

The medical profession receives most support in Greece (33%), followed closely by France and Finland (31% each), Spain (29%), Ireland (28%) and the United Kingdom (26%).

The best results for environmental protection organisations are in Austria (24%), Ireland (21%), Luxembourg (20%), Spain and Sweden (18% each).

We should also point out the high percentages for “universities” in Finland (19%), the Netherlands (15%), and Sweden and Belgium (14%).

Finally, three countries in southern Europe contribute largely to the 2% average at European level for “religious organisations”: Greece (7%), Portugal (5%) and Italy (4%).

## **Sociodemographic variables**

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27% of men and 24% of women choose consumer organisations, 22% of men and 25% of women opt for the medical profession, while 13% of men and 15% of women trust environmental protection organisations most.

As far as the age variables are concerned, those aged between 25 and 39 years are the most likely to trust “consumer organisations” (28%) and “environmental protection organisations” (15%), but they are least likely to trust “the medical profession” (22%).

As regards education, trust in “the medical profession” falls in line with the level of education of those interviewed. The opposite is true for the other two most popular responses in this respect (environmental protection organisations and universities): support for them increases in parallel with the level of education of those interviewed.

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As far as income is concerned, those with higher average incomes put most trust in “consumer organisations” (28%), those with the lowest incomes trust “the medical profession” (26%) and, finally, people with higher average incomes, once again, are those most likely to support “environmental protection organisations” (15%).

Employees (29%), closely followed by manual workers (28%), put most trust in consumer organisations; those who stay at home (27%), followed by students (26%), trust “the medical profession”; and, finally, students, the unemployed and managers (16% each) are most likely to trust “environmental protection organisations”.

We should note that “religious organisations” are quite logically chosen by 16% of the “extremely religious” and by 7% of the “very religious” (to give a general average of only 2% for this response). Nevertheless, the religious variables are inconclusive with regard to the three most popular responses analysed here.

Finally, people who have frequently discussed modern biotechnology record the lowest percentage for “consumer organisations” (19%). Moreover, trust in “the medical profession” falls as the frequency of discussions on modern biotechnology increases. Exactly the reverse is true for “environmental protection organisations”: the degree of trust in them rises consistently in parallel with the frequency of discussions on modern biotechnology.

## **8.2 The other sources Europeans also trust (EU15 and Member States)**

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Here, “environmental protection organisations” record the highest results (31%), followed closely by the two most popular sources of information from the first section, which have equal rating in this case: consumer organisations (29%) and the medical profession (also 29%).

“Animal protection organisations” (21%) are the fourth most popular source of information, followed by universities (19%), television and newspapers (16%), international institutions (13%), and then three other responses which each record 12%: farmers’ associations, national public authorities and “do not know”. All of the other suggestions record less than 8%.

### **8.3 The combined responses to both sections: the overall classification of the sources of information trusted by Europeans**

	<b>1st</b>	<b>Others</b>	<b>Total</b>	<b>Classification</b>
Consumer organisations	26	29	55	<b>1</b>
Environmental organisations	14	31	45	<b>3</b>
Animal protection organisations	4	21	25	<b>5</b>
The medical profession	24	29	53	<b>2</b>
Farmers’ associations	3	12	15	<b>9</b>
Religious organisations	2	7	9	<b>11</b>
National public authorities	3	12	15	<b>9</b>
International institutions (not private companies)	4	13	17	<b>8</b>
A specific industry	0	3	3	<b>12</b>
Universities	7	19	26	<b>4</b>
Political parties	0	3	3	<b>12</b>
Television and newspapers	4	16	20	<b>6</b>
None of these (SPONTANEOUS)	6	5	11	<b>10</b>
Do not know	6	12	18	<b>7</b>



## 8.4 Comparison with the results of the 1996 survey

It is difficult to make comparisons with the results of the previous study owing to the different wording of the questions. There were two separate versions in 1996. Each one ("Split Ballot A" and "Split Ballot B") was used for half the sample:

Split Ballot A	Split Ballot B
<i>I would now like to ask you what sources of information, in your opinion, tell the truth with regard to modern biotechnology.</i>	
<i>a) Please choose from this list the source you trust most (ONLY ONE ANSWER)</i>	<i>a) I would now like to ask you which of the following organisations you trust most when it comes to telling the truth with regard to modern biotechnology? (ONLY ONE ANSWER)</i>
<i>b) Please also indicate which other sources, in your view, tell the truth with regard to modern biotechnology (SEVERAL ANSWERS POSSIBLE)</i>	<i>b) And when it comes to telling the truth with regard to genetically modified food crops grown outdoors? (ONLY ONE ANSWER)</i>
	<i>c) And when it comes to telling the truth with regard to the introduction of human genes into animals to produce organs for human organ transplants? (ONLY ONE ANSWER)</i>
	<ul style="list-style-type: none"> <li>• Consumer organisations</li> </ul>
	<ul style="list-style-type: none"> <li>• Environmental protection organisations</li> </ul>
	<ul style="list-style-type: none"> <li>• Animal protection organisations</li> </ul>
<ul style="list-style-type: none"> <li>• Political organisations</li> </ul>	<ul style="list-style-type: none"> <li>• The medical profession</li> </ul>
<ul style="list-style-type: none"> <li>• Trade unions</li> </ul>	<ul style="list-style-type: none"> <li>• Farmers' associations</li> </ul>
	<ul style="list-style-type: none"> <li>• Religious organisations</li> </ul>
<ul style="list-style-type: none"> <li>• Public authorities</li> </ul>	<ul style="list-style-type: none"> <li>• National public authorities</li> </ul>
	<ul style="list-style-type: none"> <li>• International public authorities</li> </ul>
	<ul style="list-style-type: none"> <li>• Industry</li> </ul>
<ul style="list-style-type: none"> <li>• Schools or universities</li> </ul>	<ul style="list-style-type: none"> <li>• Universities</li> </ul>
	<ul style="list-style-type: none"> <li>• Political parties</li> </ul>
	<ul style="list-style-type: none"> <li>• Television and newspapers</li> </ul>
	<ul style="list-style-type: none"> <li>• None of these organisations (SPONTANEOUS)</li> </ul>
<i>Do not know</i>	

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The questions in the 1999 survey are based on these two versions. It is set out below:

*"I would now like to ask you which of the following sources of information you trust to tell the truth with regard to modern biotechnology.*

a) *Please choose from this list the source you trust most. (SHOW CARD - ONLY ONE ANSWER)*

b) *Please also indicate if there are any other sources you trust to tell the truth with regard to modern biotechnology. (SHOW SAME CARD - SEVERAL ANSWERS POSSIBLE)*

- *Consumer organisations*
- *Environmental protection organisations*
- *Animal protection organisations*
- *The medical profession*
- *Farmers' associations*
- *Religious organisations*
- *National public authorities*
- *International institutions (not companies)*
- *A specific industry*
- *Universities*
- *Political parties*
- *Television and newspapers*
- *None of these (SPONTANEOUS)*
- *Do not know"*

Despite these broad differences, it is possible to spot certain trends. However, we will simply compare the results of sub-question b) from 1999 and Split Ballot B from 1996:

	1996	1999
Consumer organisations	20	26
Environmental protection organisations	17	14
Animal protection organisations	4	4
The medical profession	16	24
Farmers' associations	2	3
Religious organisations	2	2
National public authorities	4	3
International institutions (not companies)	4	4
A specific industry	1	0
Universities	9	7
Political parties	0	0
Television and newspapers	4	4
None of these (SPONTANEOUS)	7	6
Do not know	9	6

On the basis of this information, the two most trusted of these groups on a European scale are the medical profession and consumer organisations. Environmental protection organisations drop three points and the other groups do not record any significant difference.

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## 9. Biotechnology: a topic of discussion?

### Overall picture (EU15 and Member States)

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Finally, those interviewed were asked if, before this interview, they had ever discussed modern biotechnology with anyone, and, if so, whether they had done so frequently, occasionally or only once or twice.

Half of those interviewed (50%) replied “No, never” to this question, a percentage which climbs to 75% in Portugal, 63% in Greece, 62% in Spain and the Netherlands, and 61% in Belgium. The lowest percentages for this answer are recorded in Germany (31%), Denmark (36%), Austria (40%), Finland (43%) and Sweden (44%).

Support for the other responses on a European scale is divided as follows: 24% for “Yes, occasionally”, 18% for “Yes, only once or twice” and 6% for “Yes, frequently”.

Finland (37%), Denmark (36%), the new Länder (also 36%, to give a German national average of 33%) and Austria (25%) are most likely to respond “Yes, occasionally”.

Results for “Yes, only once or twice” reach 27% in Sweden, 25% in West Germany (to give a German national average of 24%), 22% in Greece and 20% in France and Ireland.

Finally, the response “Yes, frequently” is most popular in Austria (17%), far ahead of Denmark (11%), Luxembourg (8%), Finland, Germany and the United Kingdom (7% each), and France (6%).

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## Sociodemographic variables

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Women are much more likely than men to have never discussed modern biotechnology (54% compared to 47%), as are the oldest sections of the population (59% for people over 55, compared to between 45% and 48% for the other age groups). The frequency of discussions falls dramatically with the level of education and income.

Thus, those who left school earliest are most likely to respond "No, never", 68%, with 48% for those who left between 16 and 19 and only 33% for those who left at 20 or over. In parallel, the lower income bracket records 60%, the lower average income bracket 52%, the higher average income bracket 44%, and the highest income bracket 35%.

Those least likely to give a negative response are managers and students, with those who stay at home and pensioners at the other end of the scale.

The religious variable is quite interesting. With a few exceptions, the percentage of negative responses falls in line with the degree of religious inclination, with the extremely religious most likely to respond "No, never" and agnostics least likely.

"Religious inclination"	%
Extremely religious	66
Very religious	56
Quite religious	53
Neither religious nor non-religious	50
Quite non-religious	48
Very non-religious	49
Extremely non-religious	43
Agnostics	26
Atheists	41
Anti-religious	44

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## Comparison with the results of the 1996 survey

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There are very few differences between the results of the 1996 survey and those of the 1999 survey. Therefore, Europeans do not seem to discuss biotechnology any more now than they did three years ago.

	1996	1999
No, never	51	50
Yes, once or twice	15	18
Yes, occasionally	26	24
Yes, frequently	6	6
<b>"Yes" total</b>	<b>47</b>	<b>48</b>
Do not know	2	2