

## AGRICULTURAL BIOTECHNOLOGY: WHY DO EUROPEANS HAVE DIFFICULTY ACCEPTING IT?

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Agricultural experts expect "massive changes in agribusiness" when biotechnological methods and products finally penetrate the market place, as Professor Burke reminded us recently in London (Consumer acceptance, 1998). He also mentioned concern about the way in which this penetration will be carried out, "...consumers feel that they have lost control and they do not know where the control lies." Politicians, apparently, do not know how to handle the questions posed by genetically modified organisms (GMOs) either (*ibid.*). Yet genetically modified crops have already arrived.

This year, the world area planted with genetically modified crops will increase to 35 million hectares, up from 14.2 million in 1997. Of the 35 million hectares planted in 1998, 88 percent will be planted in North America, 6 percent in Latin America, 6 percent in Asia, and perhaps one thousand hectares in France (Cultures transgéniques, 1998). Europe's area is not expected to exceed one percent of the total area planted by the year 2000; representing a tiny part of the \$2 billion market expected by then (GM crops, 1998).

How is it possible that Europe, with its strong life sciences research, and powerful agrofood industry, can be trailing so far behind the United States (U.S.) and soon behind China as well? Is negative consumer response to blame for such a lagging position? Hoban reviews evidence from key surveys in the U.S. and Europe. A key finding emerging from these surveys is that differences between U.S. and European consumers, in terms of their perceptions about biotechnology, are not as substantial as expected. The perception of the risks associated with biotechnology and an overall awareness of biotechnology are somewhat lower with U.S. respondents. Acceptance of the technology in the U.S. is slightly higher.

Sure, environmental groups, such as Greenpeace, have applied political pressure on government and industry while anonymous activists have destroyed field trials. Over-regulation by national administrations has also been a deterrent to investment in the development of transgenic crops (Studer, 1994). For example, last year several European countries authorized approximately 900

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field trials (Germany authorized 61, Great Britain 148, France 333, Belgium 91, Italy 159, and the Netherlands 90). During the same year, the U.S. conducted 3,000 trials, for which only notification of the Environmental Protection Agency (EPA) was required. Applicants in Europe have had to go through lengthy procedures (Dr. Rüttgers, 1998). These observations, however, do not provide a sufficient explanation of such an important gap. Activists and over-regulation are part of deeper-lying cultural differences.

### **National Differences In Europe**

When aggregate U.S. and European figures are cited, they tend to obscure existing national differences. Variations in behavior and culture among different regions of the U.S. are not very large. In Europe, such variations do matter. Several authors have stated that opinion polls show a cultural cleavage between the Northern and Southern countries of Europe (Hamstra, 1991; Hoban & Kendall, 1992). Two former Eurobarometer surveys confirm this view (Zechendorf, 1994). In many respects, Germanic countries show similar attitudes about the facts of life as Romanic countries do. Irish attitudes strongly mirror those found in Southern Europe, as do Greek attitudes. France, in many respects, is a country in-between the two extremes, and is close to the European average. Also Finnish attitudes, however, can be quite different from Scandinavians.

How do cultural differences translate into differences in the public perception of biotechnology? Knowledge and awareness of biotechnology issues are quite high in the Northern countries (the five leading countries are the Netherlands, Denmark, Sweden, the UK, and Finland). Knowledge and awareness are low in the Southern countries (Greece, Portugal, and Spain, but also Austria and Ireland). Germany and France are close to the average. The countries most convinced of the benefits of modified plants and food are three of the Northern countries -- the Netherlands, Finland, and the United Kingdom. These countries are followed by Portugal, Italy, and Spain. The countries least convinced of the benefits are other Northern countries, namely, Austria, Sweden, Luxembourg, and Germany. In addition, Greece and France are also countries less convinced of the benefits.

The risks associated with genetically modified food and plants are mostly perceived by people from Northern Europe, namely, by the Netherlands, Denmark, Sweden, the UK, and France. Finland, Belgium, Spain, Greece, and Austria are less wary of the risks, with Germany being closer to the European average. A high percentage (16 to 20 percent) of Austrians do not have an opinion on the risks or benefits of biotechnology. This result corresponds to the low level of knowledge about biotechnology observed in Austria.

Genetically modified food and plants are morally acceptable to the majority of the Dutch, Finnish, Portuguese, Italian, and Belgium people, but unacceptable to most Austrians, Germans, Danes, Swedes, and Luxembourgers. French people are close to the European average, while the Irish are the most indecisive (European Commission, 1997).

In conclusion, the 1996 Eurobarometer does not fully confirm the hypothesis that cultural differences in Europe influence attitudes towards biotechnology. However, a clear trend does exist. Southern countries tend to accept biotechnology, while Northern countries are more cautious. The notable exceptions are the Netherlands and Finland, which are both strongly in favor of biotechnology. Likewise, the Dutch are the most concerned about the potential risks involved. One explanation of these apparent differences can be found in the preferences for different information sources. Northerners trust information from alternative sources, such as, consumer organizations and environmental groups. They have considerably less faith in established sources, such as, public

authorities and universities. Exceptions are the Netherlands, Austria, and Italy. The extreme attitude of Austrians may be explained by their dominant conservatism which is expressed as an attachment to traditional methods and religion (Catholicism). As a result, Austrians are poorly informed of the challenges of biotechnology (*ibid.*). The recent ban of the U.S. imported *bacillus thuringiensis* (Bt) maize has to be considered a reaction to the delayed onset of public debate.

## Religious And Cultural Differences

How can the considerable differences in attitude between Northern and Southern Europe be explained? If we look at religion as a possible explanation, the results are not conclusive. Scandinavian countries are overwhelmingly Protestant, while the Mediterranean countries (including France) are Catholic or Orthodox (Greece). The United Kingdom is mainly Anglican, while Ireland is strongly Catholic. In the Netherlands and Northern Germany, Protestantism prevails, while in Belgium, Luxembourg, Southern Germany, Switzerland, and Austria, the majority of people are Catholic. Despite some common patterns, a line can not be drawn between the North and the South in terms of religion.

Cultural differences match the separation between Germanic and Romanic people a lot better. European nations are inhabited by an age-old mixture of ethnic groups, defying any attempt at classification along national lines. The discrepancies observed in the surveys are rooted in cultural rather than ethnic or religious differences. The Germanic-Romanic division coincides with the boundaries of the Roman Empire. This is best observed in Belgium, where the cultural divide literally exists along the old Roman frontier. The civilized Gallo-Roman area in the South became the Wallonian region, while the “barbarian” North became the Flemish region. The exceptions to this division of countries are Southern Germany, Switzerland, and Austria, which became thoroughly Germanic while still belonging to the Roman Catholic church. Also, Ireland is an exception. Ireland was never colonized by the Romans but still observed Roman culture inside Christian religion beyond the Roman empire’s existence.

Geert Hofstede (1980) has developed an interesting theory of this Post-Roman split. He has postulated four types of socio-cultural behavior which form a matrix within which each nation falls. His theory is based on a survey of the attitudes of 120,000 people in 40 countries. He distinguishes the following dimensions (1980, p. 123):

- *Individualism versus collectivism.* This dimension describes the degree to which individuals in a society are integrated into groups;
- *Masculinity versus femininity.* This dimension reflects the distribution of values between the sexes;
- *Power distance.* The extent to which less powerful members of organizations and institutions accept, and expect, that power will be distributed unequally;
- *Uncertainty avoidance.* This dimension reflects a society's fear of the unknown. The extent to which its members feel uncomfortable in situations where no standard rules of behavior exist.

According to Hofstede's findings, typical individualist countries are Italy, Great Britain, and the Netherlands, while Portugal, Greece and Spain are collectivist. Individualism has developed in countries that have experienced wealth over the centuries. In terms of attitudes about biotechnology,

people from these countries tend to believe in their capacity to understand biotechnology, judge biotechnology applications as having lower potential benefits, and are morally opposed to animal biotechnology.

In countries where masculine authority dominates (Finland, Spain, and Italy), the perception of the risks associated with biotechnology is lower. Understanding of biotechnology is, in general, lower in these countries than in countries with more feminine authority, such as the Netherlands, Denmark, and Germany. Furthermore, Hofstede found that a preference for television as a prime source of information is correlated with strong uncertainty avoidance. Countries exhibiting uncertainty avoidance include Portugal, Greece, Spain, and France. Newspaper readers tend to be less bothered by uncertain events. Countries which tolerate uncertain outcomes include the United Kingdom, Ireland, the Netherlands, and Denmark (Hofstede, 1992).

## **Geography**

Europeans also live in different geographic environments under the influence of very different climates which tend to influence attitudes and behavior. Northern Europe's harsh climatic conditions make nature an enemy against which solidarity is most important for survival. In contrast, Southern Europe benefits from a benign climate where everything grows effortlessly. Here, human competition is the limiting factor, and strong authority is important for survival.

These geographic conditions have led to remarkable differences between the North and the South. Northern countries are concerned about nature which is no longer seen as a threat but threatened by man and technology. Northern countries are concerned about protecting the whole biosphere, and the relationship between animals and man. This influence of geography is also reflected in the concern over novel foods. Southern countries are more concerned with human issues, focusing on abortion or euthanasia. These countries are concerned more about the quality of traditional foods and embrace technology as a means to using nature. The preponderant influence of the Catholic church has reinforced the ancient Roman attitude towards man's relationship with animals. This has resulted in a considerable distance between man and nature. While a Northerner is likely to spend his leisure time walking through the woods, a Southerner prefers relaxing in the refreshing atmosphere of a patio.

The production and distribution of biotechnologically processed foods has to take into account the different attitudes of the North and South. Northern European people have to be convinced that a novel food has a beneficial purpose, such as reducing pesticide and herbicide use, or it will not be accepted. In the North there is a strong preference for "natural" food because naturalness is linked to health, quality, and taste (Hamstra, 1991). The long shelf-life of genetically modified tomatoes has been greeted by Steve Emmott of Genetic Forum in the United Kingdom as, "...a food trend which we don't like. It fakes freshness. Consumers are getting a dressed up old tomato." (Studer, 1994). The release of genetically modified organisms into the environment is considered a potential threat to nature by environmental groups, such as Greenpeace. "This is ecological madness" said Isabelle Meister of Greenpeace. Meister suggested that genetically modified organisms can spread from the designated plant to the rest of the environment, threatening local fauna, causing diseases, and poisoning ecosystems (*ibid.*).

In contrast, for Southerners taste always comes first, ahead of quality and safety. Concern over the health aspect of food is fairly low. The lack of information on biotechnology, combined with the culturally inherent distance from nature, leads to a strong acceptance of the dissemination of genetically modified organisms. For example, in Spain 81 percent of respondents accept the possibility of

genetically modified plants, while 61 percent accept the possibility of genetically modified animals (Moreno, Lemkow, & Lizon, 1992). Until now, neither the Catholic church, nor the consumer organizations have publicly addressed biotechnology issues in Spain and Italy. This is especially the case for applications in agriculture (Smink & Hamstra, 1994).

In order to have a reasonable and efficient public debate on biotechnology, communication between the main players in society is very important. There are countries where good communication exists. The Netherlands benefits from a dense network of information and the exchange of opinion. For example, Unilever established a platform on which it could bring consumers, scientists, managers, and administrators together. In 1993 the first Dutch consensus conference was organized about the acceptability of genetically modified animals. Such communication lines are almost absent in Spain and Italy (*ibid.*).

## **Conclusions**

What can be said about the differences between Americans and Europeans in terms of their understanding and attitude towards biotechnology? Hofstede has found that in terms of socio-cultural attitudes, countries fall into distinct clusters which do not always coincide with geographic regions. European countries belong to at least four different clusters (Hofstede, 1991). First, Germany, Switzerland, Finland, and, at the extreme, Austria form a cluster characterized by a small power distance and a strong uncertainty avoidance. These countries respect rules, are well organized, and tend to keep power on a low political level.

Most Southern countries, Italy, Spain, Portugal, Greece, France, and Belgium, belong to a large cluster defined by a broad power distance and strong uncertainty avoidance. They share these attitudes with Latin American countries, Yugoslavia, Turkey, Japan, and Korea; all hierarchical societies with strict rules. Greece and Portugal are extremes within this southern cluster, while Italy is closest to the middle.

Denmark, Sweden, the United Kingdom, and Ireland form another distinct cluster. These countries exhibit small power distance and weak uncertainty avoidance. People in these countries are individualistic and self-reliant with a distaste for written laws. Finally, Norway, the Netherlands, Australia, the United States, and Canada form another cluster. These societies are structured around compromises: regional power and federal government, individualism and strict rules, high risk awareness and acceptance of beneficial products, and strong religious tendencies with a tolerant, open-minded spirit. These societies are probably the result of a highly interesting amalgamation of different cultural streams, originating from various regions of Europe. Regional socio-cultural differences are not as important in North America as they are in Europe. North American attitudes mirror those of the average European, and are not as diverse.

The real reason for Europe lagging behind the United States in terms of its development of biotechnology is the difference in the scale of comparison. The gap between Europe and the U.S. can be small, or large, depending on the individual country. The United Kingdom is similar to the United States in many respects, while Germany is industrially well advanced but hampered by regulation and public opposition. France, until recently, has been calm over the issue of biotechnology but its industry is still catching up to the rest of Europe and the U.S. Italy is far behind the U.S. but it has a very positive attitude towards biotechnology. The Netherlands is supportive of business in general but is concerned about biotechnology. Sweden is strong in some fields of biotechnology, although it is over-cautious in its approach. Yet each time there is a comparison made between Europe and the U.S., the

impression has been created that Europe should be measured against a dynamic, unproblematic U.S. It is difficult to make predictions in such a complex field as biotechnology. Behavior does not change rapidly but over time. Fears that a cultural steam-roller will unify every cultural difference in Europe in a short time period are unfounded. Nonetheless, the ubiquitous taste for American culture and behavior among younger Europeans might lead to a more relaxed attitude towards genetic engineering.

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