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## RESEARCH IN ECONOMICS AND RURAL SOCIOLOGY

### CONSUMER BEHAVIOURS WHEN CONFRONTED WITH GMOs IN FOOD: LESSONS DRAWN FROM EXPERIMENTAL ECONOMY

The introduction of genetically modified organisms (GMOs) in human and animal food has given rise to a fascinating debate in Europe. Yet, in France and in the European Union, introducing GMOs in food cannot be done without prior permission. This permission can only be granted after a complete scientific procedure of risk assessment for health and environment has been carried out. In spite of these precautions, French/European public opinion remains predominantly quite hostile: our own investigations show that 89% of French opinion is opposed to the presence of GMOs in their food and 79% think GMOs should be purely and simply forbidden.

A recent European Union regulation (180/2003) has given a framework for the traceability and labelling of GMOs. This regulation ensures complete and reliable information to consumers, letting them choose with full knowledge of the facts. In practical terms, the EU has decided to impose the note "contains GMOs" on transgenic products. To be exempt from the label there must not be more than a 0,9% trace of GMOs in the ingredients of the product, introduced in an accidental or technically unavoidable way.

Are these measures likely to convince consumers to accept GMOs? The survey, led by Charles Noussair, Stéphane Robin and Bernard Ruffieux (UMR GAEL-INRA) at Ecole Nationale Supérieure de Génie Industriel in Grenoble-France, uses experimental economy methods to analyse French consumers' actual purchase behaviour in the face of GMOs. Carried out at the very moment when the legislative texts were most largely debated, the survey observed consumer behaviour even after products containing GMOs had been withdrawn from sale and when public decisions were largely open (choice of banning or admitting GMOs, choice of labelling the products containing GMOs or the GMO-free ones, selection of the permissible threshold of contamination to accept a GMO-free labelling, selection of a zone for so-called products and ingredients, etc.).

In practical terms, this survey measures consumer propensity to pay for a product. Propensity means the optimal amount that a person is ready to pay for a product.

To begin the experiment, the participants taste several products while totally unaware of any GMO content. Thanks to a Vickrey auction-type procedure, and after each sample tasting, the individual propensities of each taster to pay for each product are then measured. Next, by gradually introducing information about each product, we can observe the impact of this information on the individual's propensity to pay for products. In this way, the protocols employed can measure the impact of a characteristic alteration of a product, or of a piece of information regarding this characteristic, on the individual's propensity to pay.

Research helps to answer the following questions: far beyond the expressed opinions, which consumers would purely and simply refuse to buy foodstuffs containing GMOs? For those who accept these products, what is the impact of the GMO content on their propensity to pay? What is the accidental permissible threshold of contamination for consumers? What is the appropriate labelling?

The participants in the study come from a demographic sample representative of French consumers: the experiments were carried out in Grenoble, France.

The results are the following. Generally, we notice that consumers massively value GMO-free foodstuffs. There is evidence that **34,9%** of consumers who purchase a conventional product will no longer purchase it if they know it to contain GMOs. In a typology of consumers, we call this group the *unwilling consumers*. For this group, there is a problem of real, and not only stated, acceptance of GMOs. Among the other 65,1% of consumers, that is to say those who purchase products containing GMOs, a group of **42,1%** form what we call the *reluctant consumers* who lower their propensity to pay in relation to the conventional product (this propensity is revealed by an average decrease of 26,5% in the amount of the purchasing offers). Finally, **23%** of the consumers are **indifferent**, indeed **favourable** to the presence of GMOs : their propensity to pay is unaffected or even encouraged when they know that a product contains GMOs.

Was it reasonable to keep a near 1% threshold and to choose to label products containing GMOs rather than permitting a clear GMO-free sign for the products that do not contain

GMOs? A product, simply presented as GMO-free guaranteed is not refused by anybody. With a clear and accidental contamination threshold of 0,1%, the threshold of refusal of the product reaches 4,4%. With a 1% threshold (the final choice of the EU) 10,7% of the unwilling consumers refuse to purchase the product. Yet, there is truly a niche of consumers for guaranteed GMO-free products, in comparison to non-labelled conventional products, 33,8% of consumers increase their propensity to pay (by an average of 28,3%) for a guaranteed GMO-free product at a threshold of 0,1% contamination. Incidentally, in other respects, it is worth noting that for consumers the fact that such guaranteed GMO-free products come from organic farming has no significant impact on their propensity to pay, whereas it is well known that the “organic” labelling has a real consumer impact on a conventional product.

Are we able to define who are the *unwilling consumers* and who are the consumers refusing GMOs? In point of fact, studies show that the refusal does not match a specific demographic profile, even though it is linked to a high level of education. Nevertheless, it is interesting to note that this refusal to purchase is largely linked to a prior weak propensity to pay for the conventional product. This means that the stronger the refusal to purchase a product,

the weaker the opportunity cost of not purchasing it. A product which is little valued when conventional will become all the more easily unacceptable when containing GMOs. Lastly, we wanted to know whether a public information campaign on what GMOs effectively are and the reasons for their use, especially for the first generation of GMOs, the advantages of which are essentially agronomical, would modify consumer behaviour. To this end, at the close of the experiment, we measured the impact of general information on GMOs given to our respondents, on their propensity to pay. The result is quite clear: this impact is weak and insignificant.

All these results which, let us remember, are related to actual purchasing behaviour observed in laboratory, strongly contrast with the results of public opinion surveys. Indeed, opinion seems much more hostile than behaviour revealed in our survey. One reason may be the causality of public considerations explaining the hostile opinion. More general surveys show that markets tend to ignore this type of consideration. Strikingly, we observe that when consumers are simply asked about their purchasing *intentions*, 91,7% declare that they would ban GM French fries or tomatoes. We have seen that the actual *purchasing behaviour* is significantly different in a market situation.

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#### For more information

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