

## IDEAS FOR INDIA

for more evidence-based policy

Human Development

# How labels influence the decision to buy genetically modified food

📅 28 October, 2013



**Sangeeta Bansal**

University Of California, Berkeley

[sangeeta.bansal7@gmail.com](mailto:sangeeta.bansal7@gmail.com)



**Sujoy Chakravarty**

Jawaharlal Nehru University

[sujoyc@gmail.com](mailto:sujoyc@gmail.com)



**Bharat Ramaswami**

Ashoka University

[bharat.ramaswami@ashoka.edu.in](mailto:bharat.ramaswami@ashoka.edu.in)

*A regulation mandating labelling for all packaged products has been in effect in India since the beginning of this year. This column examines the role of information provided by labels in the decision of consumers to buy genetically modified food. It is found that Indians have a lower threat perception of genetically modified ingredients as compared to Europeans.*

The labelling of genetically modified (GM) foods varies between countries. Policies in the European Union (EU) favour mandatory labelling, while those of the US have chosen not to impose such requirements. Brazil and China in the developing world have adopted mandatory labelling laws, while the Philippines and South Africa use voluntary labelling. In May 2012, India passed a regulation mandating labelling for all packaged products. The regulation has been in effect since 1 January 2013.

The EU has favoured mandatory labelling of GM foods, as a policy that responds to the consumer's right to know. The label simply identifies the food as a GM product, and does not carry any safety warnings. It is believed that consumers have consumption preferences in terms of the process by which food is produced, and that informed choice is therefore promoted by mandatory labelling. The US position, on the other hand, is based on the principle of 'substantial equivalence'. This means that if a GM food demonstrates the same nutritional characteristics and composition as its conventional counterpart, then it is deemed to be just as safe, and not subject to mandatory labelling. Only those novel foods that are significantly different from their conventional counterparts are seen to be deserving of mandatory labelling. Such a product-based regulation assumes that consumers have preferences only about products, and are not interested in processes.

If we assume that consumers only have preferences over products, a mandatory label for a substantially equivalent GM food may lead a consumer to believe that the food is unsafe. This may be the case even when the label is simply a summary of whether or not the food was produced using GM technology. The US Health Secretary is quoted as saying, 'Mandatory labelling will only frighten consumers. Labelling implies that biotechnology products are unsafe.' A study of US households by Jayson Lusk and Anne Rozan, published in 2008 provides some support for the argument that even neutrally worded labels are signals that change consumer behaviour. Consumers read the label as a signal that the product may have unspecified health consequences. The study concludes that individuals who believe that the government enforces a mandatory labelling policy are less likely to purchase and consume GM food than individuals who

believe no such policy is in place.

Thus, the EU and US positions differ on routes or mechanisms through which mandatory labelling is likely to affect the demand for GM foods. In our study, we examine the roles of information and signalling on consumer decisions in India (Chakravarty et al. 2013). In particular, we estimate the minimum value of the informational impact of labels on GM food aversion. By the effect of information, we mean by how much the valuation of the GM food goes down as a result of the consumer being aware that the product may contain a significant amount of GM ingredients - the consumers have uncertain information about whether or not the product is genetically modified. On the other hand when the uncertainty is resolved by labelling the food, it may immediately signal to the consumer some unspecified health consequences of using the product.

## **The study**

We try to estimate the impact of the presence of uncertain information and GM labelling on the valuation of two products that are close substitutes. Our experiment is similar to the studies published by Charles Noussair, Bernard Ruffieux and Stephane Robin (2002, 2004) that use a bidding mechanism (Becker, De-Groot and Marschak 1964) to understand willingness to pay (WTP) for a pair of commodities which are roughly identical. The only difference is that one of the products contains a GM ingredient, and the other does not. In our case, we use closely substitutable chocolate chip cookies that are available in stores in New Delhi. Out of our total pool of 114 subjects, 64 are students of the Indian Institute of Technology (IIT) and 50 are college teachers from different parts of India. The students are all below the age of 25, and the college teachers mostly in their early thirties. Females comprise 39% of the sample, and the sample is representative of the uppermiddle class in India in terms of family income and parents' educational attainments.

Participants arrive at the venue of the experiment, fill out a demographic questionnaire, and are given 200 units of lab currency (each unit is about Rs.25 or \$0.4 approx.). In the first round, they are asked to taste the two products. The biscuits are given to them without any packaging, and no other information is provided. The participants rate the biscuits on a seven-point scale calibrated in increments of 0.5. Then they are asked to bid for each of the products ("how

much would you be willing to pay for this product?”), using the 200 units of lab currency they were provided at the beginning of the experiment.

In the second round, participants are provided with a one-page write-up about GM foods and their status in regulation. This write-up has been carefully phrased to be in absolutely neutral language. The subjects are then asked to rate on a five-point scale their understanding of how probable it is that each of the products contains GM ingredients. This was followed by another round of bidding based on their WTP, as in round one.

In the third round, a label is attached to the product that contains GM ingredient(s). The label reads, “This product may have been subject to genetic modification”. This is the label that has been stipulated by the Government of India under its new policy. The introduction of this information into the experiment clarifies which of the two products contains GM ingredients. The subjects are now asked to again provide their WTP for each of the two products.

In the fourth and final round, the two brand names of the cookies are revealed, and the subjects are asked to provide a fourth set of WTPs.

We define the aversion to GM foods as the difference between the bid prices for the non-GM product, and those for the GM product. The effect of information measures the impact of uncertain information on the aversion to GM foods. Using this definition, we calculate the informational impact of the GM label as the difference between the bids in round two, while accounting for the difference in perceived quality that emerged from the blind tasting procedure in round one. If information matters then subjects will revise their valuations downwards for at least one of the products depending on how they subjectively evaluate the uncertainty presented to them. The signalling impact is the extent of GM aversion that arises out of the provision of a label that identifies the product as GM. This signalling impact is captured by the difference in bids in the third round, accounting for the quality difference that emerged in the first round.

In our experiment we can estimate only the minimum amount of the informational impact of the GM label by the extent of aversion in the third round relative to that in the second round. The reason that it is not possible for us to find the exact impact of information in the presence of ‘information inert’

subjects who do not change their bidding behaviour in the second round but when they are shown the labels in the third round, they express significant GM aversion. This third round behaviour (for the information inert) is potentially the sum total of both an informational component (which they did not indicate in round two) and a signalling effect of the label, but the two effects cannot be disentangled from each other.

## Results

In the first, blind tasting round, the non-GM product is averagely rated to be superior to the GM product. In the second round, after reading the material circulated on GM foods, participants are asked to evaluate the likelihood that one or the other product contains GM ingredients. This evaluation, on a scale of one (contains no GM) to five (contains GM for sure), revealed that participants attributed a 50% chance of containing GM to each product, on an average. Further, using taste as the only way of evaluation, they rate the actual GM product as more likely to be genetically modified.

The second round price bids reflect this informational impact, and the average WTP for either product is lower than in the first round. We find that any chance that a product contains GM ingredients causes prices to be significantly lower, if everything else remains equal in terms of person-specific characteristics (gender, age, income, snacking habits). However, one-third of our sample does not change their price bids for both products in response to the information we provide. These individuals are deemed to be information inert.

In round three, when the label is provided, we find that that about half our sample is GM averse. The other half is found to be either GM loving or GM indifferent.

In simple language, our main findings are: First, only about half of our sample of consumers displayed GM aversion. Second, between half and three quarters of this measured aversion is due to the presence of uncertain information regarding the products that they sample, leaving a significantly smaller signalling impact that arises out of the subjects observing a label.

## Conclusions

Comparing our results to the French sample studied by those by Charles Noussair et al. (2004), we find that in our developing country context, 50% of the subjects do not display any measured GM-aversion as compared to 23% of French subjects that displayed similar behaviour. Furthermore, 35% of French subjects were unwilling to purchase products made with GM components as compared to only 8% of such subjects in our sample. Thus there is definitely a lower threat perception of GM ingredients among Indian consumers as compared to European consumers.

Additionally, we find that for GM-averse consumers, the informational impact of GM labels dominates the signalling impact. And finally, we identify certain consumers who are information inert but GM-averse. These consumers may be influenced by information, but do not prefer the non-GM product until a GM label is provided. It may be that they too are responding to information, but it cannot be measured within our experimental framework, as their response confounds the informational effect with that arising from the disclosure of the label.

### Notes:

1. For our entire sample, the measure of GM aversion is only about 7.5 lab currency units. However, for the GM-averse half of our sample, it is 24 lab currency units. The lowest value for the informational component for the GM averse is approximately 14 units of lab currency. Furthermore we estimate that among the GM-averse subjects, 60% of the aversion is due to the probabilistic information in round two. If we leave out the information-inert subjects, this component explains about 76% of the GM aversion that we observe.

### Further Reading

Bansal, S., Chakravarty, S. and B. Ramaswami (2013) “The Informational and Signalling Impacts of Labels: Experimental Evidence from India on GM Foods”, forthcoming, *Environment and Development Economics*.

Becker, G., M. DeGroot, and J. Marschak (1964), “Measuring utility by a single response sequential method”, *Behavioral Science*, 9: 226–232

Lusk, J.L. and A. Rozan (2008), “Public policy and endogenous beliefs: the case

of genetically modified food”, *Journal of Agricultural and Resource Economics*, 33: 270–289.

Noussair, C., Robin, S. and B. Ruffieux (2002) “Do consumers not care about biotech goods or do they just not read the labels?”, *Economic Letters*, 75: 47–53

Noussair, C., Robin, S. and B. Ruffieux (2004), “Do consumers really refuse to buy genetically modified food?”, *Economic Journal*, 114: 102–120.