
BELIEFS ABOUT GENETICALLY MODIFIED FOODS: A QUALITATIVE AND QUANTITATIVE EXPLORATION

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This study is aimed to examine consumers' beliefs about genetically modified foods. Ten focus group interviews of community members and a random questionnaire-based mail survey of 500 Australian (Victorian) adults were conducted (58% response). Participants were generally negative about genetically modified foods, with concerns being raised about them being unnatural, difficult to identify, and having unknown long-term health and environmental effects. Many participants were unaware of or disagreed with the benefits of genetically modified foods that are promoted by its advocates and there were some misconceptions present. These findings provide information for both advocates and opponents of genetically modified foods and a basis for future larger-scale research.

KEYWORDS Genetically modified foods, Beliefs, Australia, Survey, Focus group

INTRODUCTION

The genetic modification of food is one of the most recent technological innovations that has been applied to agriculture and it is a controversial

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issue for consumers, the food industry, and scientists. Genetic modification can be defined as the process of cutting a piece of DNA from one organism and transferring it into another in order to change its properties. Classical breeding (e.g., crossing plants, inseminating animals) is generally not considered as genetic modification even if this technique also aims at choosing superior genetic traits (Magnusson and Hursti, 2002). The main aims of the genetic modification of foods are purported to include the decreased use of synthetic chemicals (e.g., pesticides), increased yields, the ability to grow crops in previously inhospitable environments, and better nutritional properties of foods (e.g., “golden rice” with vitamin A) (Harlander, 2002). However, this is debated by some, who argue that not only has it not been effectively proven that genetic modification results in improved yields or in decreased chemical use, but that it may pose risks for the environment and human health (Soil Association, 2002). Critics point out that the companies involved with genetic modification stand to make large profits from this technology. For example, companies may profit from the sale of sterile or terminator seeds (meaning farmers cannot save seeds for next year’s planting but instead need to regularly purchase seeds), from patenting of plants, or from involvement with the production and promotion of synthetic chemicals, such as herbicides, for which some genetically modified plants were developed (Cayford, 2004).

A number of surveys and public opinion polls have been conducted on consumer attitudes towards GM foods in Europe and the U.S. (Hoban, 1998; Bredahl, 2000; Gaskell et al., 2000). However, published papers regarding Australian consumers’ current beliefs about genetically modified (GM) foods are comparatively limited. Previous research in Australia includes national surveys conducted by the Department of Industry, Science, and Technology in 1994–95 (Kelley, 1995), Lawrence et al. in 1996–97 (Lawrence et al., 2001), Commonwealth Scientific and Industrial Research Organisation (CSIRO) Division of Human Nutrition in 1998 (unpublished), and for Biotechnology Australia (Millward Brown Australia for Biotechnology Australia, 2003). Published papers based on qualitative methods appear to be scarce; Baumuller’s (2001) pilot study of Macquarie University students in 2000 is the main one identified by the author. However, qualitative methods can provide an in-depth examination of consumer attitudes.

The recent Australian federal government approval of the commercial release of GM canola crops in Australia and a number of states

placing moratoriums on the commercial release of certain GM crops highlight the controversy involved with GM foods in Australia. Indeed, one large biotechnology company has suspended their development of GM canola crops in Australia due to these moratoriums. Consumers' reactions to GM foods may be critical to policy formation and to the economic viability of any such crops grown. This article aims to provide a snapshot of Australian (Victorian) consumers' beliefs about genetically modified foods using both qualitative and quantitative data collection techniques.

METHODS

The study collected qualitative and quantitative data on consumers' beliefs about GM foods. Part 1 consisted of focus group interviews. Part 2 consisted of a random questionnaire-based mail survey of Victorian adults, with Part 1 results being used to help formulate the questionnaire.

Ethical approval for the project was obtained from the Deakin University Human Research Ethics Committee. Potential participants were provided with a plain language statement containing details of the project prior to their participation. Focus group participants signed a consent form prior to the sessions. Consent was confirmed among mail survey participants by completion and return of the questionnaire.

Part 1

Interview method and research design. Questions about GM foods were included as part of a study on beliefs about plant foods. A focus group interview guide was prepared which sought consumers' views about plant foods and genetically modified foods (Denzin, 1989). Each focus group session began with a discussion on plant foods (fruits, vegetables, grains, legumes, nuts, seeds) and their benefits and barriers. (The results pertaining directly to plant foods are reported in Lea et al., in press.) To initiate discussion on GM foods as the session progressed, participants were asked the question "What do you think about genetically modified foods?". It should be noted that the moderator did not provide a definition of GM foods to participants. Participants were generally verbose on the subject, with little input required from the moderator.

However, attempts were made to probe further into the responses provided and to ensure each participant in a group gave their opinion. For example, participants were asked to provide the reasons behind their feelings about GM foods ("Why do you feel that way?"). These practices served to increase the validity of the data.

A convenience sample of male and female adults was recruited, predominantly via contact with workplaces, placing notices in shops, newsletters, letter boxes, and on a university campus, and by contacting community groups. Attempts were made to ensure that a broad range of people participated. It was advertised that participants would receive a single cinema voucher or (where applicable) could make a AU \$10 donation to their organization to ensure that not only those with a strong interest in food choice participated.

Focus groups were held in Melbourne (capital city of Victoria) between April and May 2003, usually in the place of work, at a community center, or at Deakin University. Sessions ranged in length from approximately 40 to 90 minutes. In addition to the group moderator, a note taker was present to record nonverbal language and to summarize the discussion. At the end of each session, participants completed a one-page questionnaire on their socio-demographic characteristics (e.g. age, education level).

Sample characteristics. Qualitative studies usually involve only a small number of respondents because of the emphasis on detail and depth of the information. There were 10 focus groups in total, each with between 2 and 10 participants. (Although it was not planned to hold focus groups with less than four participants, in two cases fewer than four people turned up on the day of the study.) The focus groups are outlined in Table 1, together with some of the demographic characteristics of each group. All participants were residents in Melbourne. Relatively few men and relatively few people who were not university-educated volunteered for the study. However, there was a good representation of older and younger adults.

Data analysis. All the focus group interviews were audiotaped and focus group recordings were fully transcribed. The data were coded and the main themes extracted, with the help of the qualitative software package NUD*IST (QSR N6, Version 6.0, 2000, QSR International Pty Ltd, Doncaster, Victoria, Australia). Content analysis was utilized to identify the most important factors relating to each theme (Berg, 1998; Ryan and Bernard, 2000), with direct quotations illustrating the main themes.

Table 1. Focus group composition

Focus Groups	n	Demographic Characteristics
Dietitians (hospital-based)	8	Number of men: 0 Age range: 20s – 40s Number of university graduates: 8
Church group	7	Number of men: 2 Age range: 40s–70s Number of university graduates: 2
Inner city residents	4	Number of men: 2 Age range: teens–20s Number of university graduates: 3
University staff and one local resident	4	Number of men: 1 Age range: 20s–50s Number of university graduates: 4
Dietitians (hospital-based)	4	Number of men: 0 Age range: 20s to 30s Number of university graduates: 4
Fire authority employees	4	Number of men: 1 Age range: 20s to 30s Number of university graduates: 3
Vegetarian organization newsletter subscribers	10	Number of men: 7 Age range: 20s–50s Number of university graduates: 8
Automobile club employees	4	Number of men: 0 Age range: 20s–30s Number of university graduates: 1
Older people's learning cooperative members	3	Number of men: 1 Age range: 60s Number of university graduates: 2
University undergraduate students	2	Number of men: 0 Age range: 20s Number of university graduates: 0

Part 2

Survey method and research design. Five hundred individuals were randomly selected from the Victorian population by using the software package Australia on Disc (May 2003 Version, Dependable Database Data Pty Ltd. Sydney, Australia). This package contains a comprehensive list of residences from the telephone directory.

A questionnaire, cover letter, and reply-paid envelope were mailed to each person in the sample in February 2004, preceded by a letter

informing each person that a questionnaire would be delivered to them in the next few days. In order to improve the response rate, a number of follow-ups to the original mailing were conducted. A reminder postcard was posted 1 week after the questionnaire, which was followed 5 weeks later by a replacement questionnaire posted to nonrespondents. After another month, two or more attempts were made to reach nonrespondents by telephone. The final reminder was a replacement questionnaire sent by registered post to a small number (10) of those who were unable to be contacted, in order to establish if they were actually present at that address.

The questionnaire. The questionnaire consisted of six pages of questions. It was formulated from a review of the literature (Schwartz, 1992; Magnusson and Hursti, 2002; Magnusson et al., 2003), from the focus groups in Part 1, and by pretesting among 13 consumers with varying demographic characteristics. The questionnaire included sections on beliefs about organic food, environmental beliefs and behaviors, and personal values. However, the sections pertinent to this article are those on genetically modified foods and demographics, outlined below.

1. Beliefs about genetically modified food (12 items), which are listed in Table 2. At the beginning of this section the following definition was provided: "Genetic modification of plants and animals is done by cutting a piece of DNA from one organism and transferring it into another in order to change its properties (genetic engineering). Classical breeding (e.g., crossing plants, inseminating animals) is not considered as genetic modification even if this technique also aims at choosing superior genetic traits" (adapted from Magnusson and Hursti (2002), p. 11). Response options ranged between strongly disagree and strongly agree on a five-point scale.
2. Demographics (13 items), including sex, age, and highest education level.

Data analysis. All analyses were conducted with SPSS for Windows statistical software, (Version 11.5, SPSS Inc., Chicago, IL., USA). Frequency of participants' responses to the items was measured, and cross-tabulations by sex, age, and university education group were performed (including Pearson chi-square test of statistical significance).

Table 2. Percentages of total survey respondents in agreement with genetically modified food belief items, together with percentages and *p*-values for comparisons between sex, age, and education (university vs. non-university) groups[†]

Item	% Agree (% <i>Unsure</i>)									
	All	Women	Men	<i>p</i>	16-40yrs	41-58yrs	59-84yrs	<i>p</i>	Uni	Non-uni
All GM foods should be labelled.	91 (7)	94 (5)	86 (8)	NS	93 (6)	87 (10)	91 (5)	NS	93 (6)	89 (7)
I do not know whether the foods I buy are GM or not.	61 (29)	62 (29)	61 (28)	NS	72 (21)	64 (27)	48 (39)	NS	66 (20)	58 (34)
GM foods are unnatural.	58 (30)	63 (32)	52 (28)	**	59 (30)	50 (35)	65 (24)	NS	59 (28)	58 (30)
I do not know much about GM foods.	53 (23)	62 (21)	43 (26)	**	52 (26)	57 (15)	48 (31)	NS	54 (18)	51 (27)
Multinational companies take the profits of GM foods, while consumers take the risks.	53 (35)	51 (41)	54 (28)	*	46 (44)	49 (38)	62 (23)	NS	53 (35)	53 (34)
I avoid purchasing GM food.	45 (32)	51 (32)	37 (33)	*	41 (34)	45 (31)	49 (31)	NS	42 (29)	47 (34)
GM food will help feed more people in the Third World.	34 (51)	27 (58)	40 (42)	NS	41 (47)	31 (57)	27 (48)	NS	34 (46)	33 (54)
Genetic modification decreases farmers' production costs.	27 (58)	22 (64)	34 (51)	NS	29 (59)	22 (64)	34 (49)	NS	23 (57)	31 (58)
Genetic modification increases pesticide use on crops.	14 (56)	13 (67)	15 (46)	**	13 (58)	5 (60)	23 (50)	*	5 (56)	19 (57)
There are probably no long-term health risks of GM food.	12 (51)	8 (48)	15 (54)	NS	9 (54)	12 (53)	15 (47)	NS	10 (49)	13 (52)

Table 2. Continued

Item	% Agree (% <i>Unsure</i>)									
	All	Women	Men	<i>p</i>	16-40yrs	41-58yrs	59-84yrs	<i>p</i>	Uni	Non-uni
There is little difference between GM and non-GM food.	11 (42)	6 (40)	15 (44)	NS	10 (44)	11 (39)	11 (44)	NS	8 (41)	12 (42)
There are probably no long-term environmental risks of GM food.	10 (46)	7 (41)	13 (52)	*	13 (44)	8 (47)	9 (47)	NS	10 (43)	10 (48)

^aA definition of genetic modification was provided before asking the following question: "Here is a list of various opinions about genetically modified foods. How much do *you* agree or disagree with them? (*Please circle one answer for each statement.*)" Response options provided were "strongly disagree," "disagree," "unsure," "agree," and "strongly agree." "0% Agree" results here combine "agree" and "strongly agree."

All *n* = 223; Women *n* = 115; Men *n* = 105; 16-40yrs *n* = 69; 41-58yrs *n* = 77; 59-84yrs *n* = 69; University educated *n* = 81; Non-university educated *n* = 136.

****p* < 0.001

***p* < 0.01

**p* < 0.05

NS not significant

Age groups were formed by splitting respondents’ ages into tertiles: 16–40, 41–58, and 59–84 years. Participants were split into two education groups, dependent on whether or not they had a university or tertiary qualification. A university or tertiary qualification usually means the completion of a diploma, advanced diploma, bachelor degree, graduate certificate, graduate diploma, or postgraduate degree, although these were not specified in the questionnaire.

RESULTS

Part 1

The key words that best summarise the results are reported in Table 3. The majority of participants had negative attitudes towards GM foods. This was particularly due to GM foods being considered “unnatural” — *It’s been tinkered with. It’s not natural* (Focus group 8; female) — and the perceived lack of knowledge about the long-term effects on health and the environment. The following quotes illustrate the concern with possible long-term effects.

Table 3. Key words that best summarize the main focus group research results on beliefs about genetically modified foods

Key Words (Results)
Negative:
Unnatural
Unknown long-term effects (health and environment)
Companies involved with GM foods profit and power hungry
Decreased biodiversity
Increased chemical use
Resistance problems
Identification of GM foods difficult
Labels necessary (although not always reliable)
Positive or Neutral:
Differs little to conventional methods of food production
Advance in agriculture
Increases food production-decreases hunger
Clever
Lack of scientific evidence to prove harmful effects
Curious to try
Prefer to eat GM food to processed foods

We have evolved to be eating plants for a particular reason. We don't know what changing the structure of the plant food that we eat long term will do to the human race. We're still finding things out and it seems a really basic thing for the scientists to be ... fiddling with, just to increase production and make more wealth for the big corporations. (Focus group 2; female)

That [genetic engineering] is a hard one because it's so unknown, and I fear that a little bit. I read one book on it by David Suzuki, and he was just really pushing the whole — you don't know what sort of proteins are being produced by these things and if in 50 years whether that'll have a certain effect, whether it be carcinogenic or whatever. I guess that's just a little fear that I have. (Focus group 5; female)

I don't know enough about it, but I'm a bit suspicious in terms of the environmental effects of it ... It's a new thing. You wait and see what happens before you do it on a mass scale, I say. (Focus group 4; female)

With regard to effects on the environment, decreased biodiversity, increased chemical use, and resistance problems were cited. Male participants tended to be more verbose on the potential environmental problems of GM crops.

And some of the GM foods that are produced are designed so that it's easy to apply pesticides, so the plant will be resistant to herbicide — so it will keep going despite the massive amounts of herbicide you spray on it. The problem with that is that it then kills everything else in the ecosystem, which is bad, but it also creates increased dependency on the chemical company, which is also really bad — food shouldn't require that. (Focus group 7; male)

You fiddle with the number of varieties of certain plants and maybe one day there'll be a massive disease that's one step ahead of the genetic engineering — it could wipe out your then limited stock of plant life and so on. All those other hardier varieties that mightn't have been as pretty or as productive have gone, because they've been knocked out. (Focus group 2; male)

It's worse for the environment because they all grow the same variety en masse, and that breeds disease which then wipes out all the stock because it's all one variety. (Focus group 3; male)

In addition, the companies behind GM foods were viewed by some as being profit and power hungry. For example, objections were raised about the use of technology to create crops with sterile seeds, which necessitates the purchase of new seeds every year by farmers. Patenting was also objected to.

What I do think is that it's going to mean big profits for the companies ... And, what I do object to is registering plants and this other thing of patenting them. (Focus group 9; male)

There was concern that it was not possible to tell whether a particular food was actually GM or not. Labels were identified as being necessary, although could not always be relied upon.

And products that you see labelled 'Non-GMO,' when you look at the side labels they say non-GMO ingredients included where possible ... Even products that have got the label on the front 'Non-GMO'; sure, you hope it's not GMO, but you really don't know ... which is pretty scary really. (Focus group 7; male)

I try to avoid it, but how would you know? You think the strawberries look great because they're really big — are they natural or are they big 'cause they're modified? Yeah. I avoid it. (Focus group 8; female)

On the other hand, some participants believed that the genetic modification of food differs little to conventional methods of food production or, indeed, represents an advance in agriculture.

Crops have been genetically modified since the start of farming ... It's just another step. It's a more dramatic modification, but I don't see the real big deal as long as it goes through a decent testing process. (Focus group 4; male)

Other positive, although infrequent, comments included genetic engineering being “clever” and the ability of the technology to increase food production and thus decrease hunger — *It's going to feed the Third World* (Focus group 9; female). Some comments in relation to the health impact of GM foods were more neutral rather than positive; that is, that there is a lack of evidence to prove any harmful effects of GM food. For example:

I think pretty much every day I'd eat something that's genetically modified, but I wouldn't think twice about it, because I don't believe it would harm me. With the knowledge I have about it, I'm assuming it's all OK.
(Focus group 3; male)

In addition, one respondent expressed a curiosity to try eating GM foods in order to compare them to non-GM foods. This respondent also stated that she would prefer to eat GM foods to processed foods. Similarly, a participant in another group thought matters of hygiene and food production methods presented stronger health concerns than did the consumption of GM food. Thus, for some, the health effects of GM foods may be considered relative to other factors.

Part 2

A total of 223 completed questionnaires were received. This gave a response rate of 58%, after taking into account questionnaires that were unable to be delivered. The demographic characteristics of participants are provided in Table 4. Comparisons are made in the table between the demographics of survey participants and the 2001 Victorian Census. The main biases were over representation of middle-aged people (45–64 years) and those with a nonschool qualification.

Table 2 provides participants' responses to the GM items for all participants as well as according to demographic subgroup. The majority believed that all GM foods should be labelled (91% agreement). There was uncertainty over which foods are GM and a professed lack of knowledge about GM foods. This was also reflected in the high proportion of respondents who were "unsure" about many of the items. Respondents tended to believe that GM foods are "unnatural" and that they are left with the risks of GM foods, while companies profit. Thus, respondents generally exhibited negative beliefs and uncertainty about GM foods.

There were demographic differences in the responses, particularly sex differences (Table 2). Sex differences were present for half of the items. In particular, more women than men believed GM foods to be "unnatural" and agreed that they lacked knowledge about GM foods ($p < 0.01$). More women than men were unsure about whether genetic modification increases pesticide use on crops, while men were more likely to disagree ($p < 0.01$).

Table 4. The demographic characteristics of the random population survey respondents ($n = 223$) compared with the Victorian population as a whole, as obtained from the 2001 Census

	Survey Respondents (%)	2001 Census* (%)
Sex		
Female	52.3	50.9
Male	47.7	49.1
Age [†]		
16–24 years	3.3	15.8
25–44 years	34.4	38.8
45–64 years	42.3	29.1
65+ years	20.0	16.2
Country of birth		
Australia	74.3	71.1
Other country	25.7	28.9
Employment status [‡]		
Employed full-time	33.6	29.4
Employed part-time	16.4	14.4
Unemployed	3.2	3.3
Marital status		
Married [§]	68.0	51.6
Widowed/divorced	19.6	13.1
Education status		
Nonschool qualification ⁺	62.6	34.8
Year 12 school education only	37.3	65.2

*Note that data could only be included in this table where Census items were directly comparable to questionnaire items.

[†]No minimum age prerequisite was specified for participation in the survey, but as the survey was addressed to a person listed in the phone directory it was expected that younger people (particularly under 18s) would be less likely to participate. As no one under 16 participated in the survey, the Census data for age excludes those under 16 (i.e., the percentages are expressed as a percent of those aged 16 and over).

[‡]The survey percentages for “employed full-time” and “employed part-time” exclude those self-employed, as there was a separate category for the latter, comprising 8.2% of the sample. However, the Census data included the self-employed with full-time or part-time employed. Therefore, the survey “employed full-time” and “employed part-time” categories are an underestimate. Also note that in both the Census and the questionnaire “unemployed” does not include students and those not looking for work, such as retired people. Census percentages refer to those aged 15 and over.

[§]In the survey, “married” includes “living together,” whereas in the Census, it does not. Therefore, the survey figure is an overestimate.

⁺In the survey, this was defined as a technical or trade certificate or a university or tertiary qualification. In the Census, this was a postgraduate degree, graduate diploma, graduate certificate, bachelor degree, advanced diploma, diploma or certificate.

Age and education differences were minimal. The only item for which there was a statistically significant age difference was for pesticide use on crops, with the oldest age group being more likely than the middle-aged group to agree that genetic modification increases pesticide use ($p < 0.05$). However, this was not linear, with the youngest group being intermediate, making this difficult to interpret. There were two items with statistically significant differences with regard to university education. Those without a university education were more likely to have chosen the “unsure” response category for the item on whether foods they buy have been genetically modified ($p < 0.05$) and were more likely to agree that genetic modification increases pesticide use ($p < 0.01$).

DISCUSSION

Participants were generally negative about GM foods. In particular, concerns were raised in the focus groups about GM foods being unnatural, difficult to identify, and having unknown long-term health and environmental effects. These findings were corroborated by the survey results. Women in particular were found to be wary or unsure of GM foods. There were also some positive comments about GM foods made by some focus group participants, such as genetic modification being another step in the advancement of agriculture. Likewise, around a third of survey participants agreed that GM food would help feed more people in the Third World and that farmers’ production costs would decrease. However, overall, most participants were either unaware of or disagreed with the benefits of GM foods that are promoted by its advocates (e.g., health benefits). Although not specifically examined in the present study, factors that may help to form such consumer opinions about GM foods include level of trust in regulatory bodies and the kinds of information provided by the media (Frewer et al., 2002).

Previous European research on beliefs about GM has also found that many consumers believe GM foods to be unnatural (Frewer et al., 1996; Hill et al., 1998; Bredahl, 1999; Magnusson and Hursti, 2002). Also in concurrence with the present research, the national Australian consumer survey conducted by Lawrence et al. (2001) in 1996–97 found that respondents were concerned about the risks associated with genetic engineering. For example, 56% considered there to be long-term health risks associated with the consumption of GM foods. Similarly, concern with health risks appeared to influence acceptance of GM foods in Baumüller’s (2001) pilot

study of Macquarie University students, possibly due to factors such as lack of information. The present research appears to indicate that consumers remain wary about GM foods, despite (or perhaps because of) the increasing availability of GM foods in Australia. Indeed, compared to the 2001 survey, the 2003 survey conducted for Biotechnology Australia suggests that fewer consumers viewed the use of gene technology in the production of food and drink as useful, and were more inclined to reject eating foods that had been genetically modified (Millward Brown Australia for Biotechnology Australia, 2003). Gaskell et al. (2004) suggest that it is the absence of consumer benefits that plays a larger role in consumer sentiments about GM food than does misperception of risks. Many participants in the present study were unaware of or disagreed with the potential benefits of GM food. For example, only around a third of participants agreed that GM food would help feed more people in the Third World and decrease farmers' production costs.

This study suggests consumers need more information about GM foods, such as additional labelling (e.g., providing reasons for why it has been modified). They need to know how to identify food that has been genetically modified from that which is not, as there is clearly some confusion about this. For example, the misconception from the focus group research that fruit that is larger than or otherwise different in appearance to the usual is (necessarily) genetically modified needs to be overcome. This consumer confusion was also found in the survey conducted for Biotechnology Australia (Millward Brown Australia for Biotechnology Australia, 2003). Part of the concern over identification appears to be related to concerns over labelling regulations. For example, the exemption from labelling of highly refined foods such as oils and the tolerance level of 1% in relation to the unintentional presence of GM foods or ingredients may mean some consumers' fears that they may be eating GM foods are not allayed.

The majority of focus group study participants were female and university-educated. European and UK research has indicated that women are less likely to be in favor of GM foods than are men (Frewer et al., 2002; Gaskell et al., 2004), as was the case among the mail survey respondents. Previous (UK) research has found that those with a higher education appear to be more in favor of GM foods than those with a lower education level (Frewer et al., 2002). However, for this survey, there were few education group differences, although the main difference—that genetic modification increases pesticide use—was indeed believed more strongly by those without university education. Some biases may be

present in the focus group study due to the overrepresentation of females and those with a university education, although, in effect, they may cancel each other out. The survey respondents were more likely to be university-educated than the Victorian population, but the presentation of data according to education status has allowed this and any age and sex differences to be taken into account.

CONCLUSIONS

While the focus group study was based on a relatively small and well-educated sample, it does provide in-depth information from consumers that is not provided using other survey techniques such as questionnaires. The survey study provides data from a larger, more representative sample of consumers. In particular, the survey provides details on the prevalence of consumer opinions, as focus group interviews are important for their ability to provide an indication of the *range* of views present in the community. The results add to the relatively limited knowledge about Australian consumers' perceptions of GM foods and provide a basis for more comprehensive research in the future. Given the topical nature of the GM food issue, it is important that those working in the area of food and health are aware of consumer beliefs in order to provide accurate information and advice when necessary.

The information this study provides on public opinion of GM foods has implications for GM food policy and legislation in Australia and worldwide. The findings suggest that if GM food policy is to be in alignment with consumers' current opinions and concerns, stricter controls of GM food production and GM food in the marketplace need to be in place. Legislation to implement detailed labelling of GM foods may be useful both to allow identification of GM foods and to inform consumers about the benefits and risks of genetic modification. In addition, the current policy in Australia to exempt some foods from labelling and the 1% tolerance level may need to be rethought, or additional consumer education campaigns instigated.

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