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Supporting document 3

Overview of FSANZ consumer research

P1055 – Definitions for gene technology and new breeding techniques

At the 2nd Call for Submissions (CFS), FSANZ provided an overview of consumer research FSANZ undertook or commissioned. This overview, which is unchanged since the 2nd CFS, is now provided as supporting document 3.

1 Consumer research

1.1 Overview of research

Maintaining a high degree of consumer confidence in the quality and safety of food is one of FSANZ's key objectives. In order to gain a greater understanding of general community attitudes towards NBTs and GM foods, FSANZ supplemented the information gained through the consultation process with three pieces of bespoke consumer research. These were:

- a systematic literature review on consumers' awareness, knowledge, risk perceptions and behaviours in relation to the use of NBTs, including genome editing, for food production;
- new empirical research using focus groups to investigate consumer awareness, knowledge, and attitudes to NBTs in Australia and New Zealand; and
- a nationally representative survey of consumers' perceptions of and attitudes towards GM foods and NBTs used in food production.

In addition, FSANZ incorporated a number of questions about GM foods and NBTs used in food production into FSANZ's annual Consumer Insights Tracker (CIT), a nationally representative survey of approximately 2,000 Australian and New Zealand consumers.

In the following section, the key findings from each of these pieces of research are briefly summarised, followed by overall conclusions from the consumer research.

1.2 Summary of findings

1.2.1 Systematic literature review (2021)

In July 2021, FSANZ commissioned the Australian National Centre for the Public Awareness of Science at the Australian National University to undertake a systematic literature review on consumers' response to the use of NBTs in the production of food. The review included 146 studies, the majority of which were based on populations outside of Australia and New Zealand. The full report is available on FSANZ's website.¹ Key findings are outlined below.

Knowledge and awareness

- Self-reported knowledge and awareness of NBTs is low in Australia, and has not been explored in New Zealand. Levels of knowledge and awareness of NBTs are lower than for GM. This is also the case in the international context.
- People who were younger and/or more highly educated were more likely to report knowing more about NBTs. Gender was not associated with reported knowledge.
- Australians trust government agencies (CSIRO, NHMRC² and FSANZ) to provide information about gene technology. Industry groups and overseas regulators were least trusted.

¹ Consumer responses to the use of NBTs in the production of food – <https://www.foodstandards.gov.au/food-standards-code/proposals/p1055-definitions-for-gene-technology-and-new-breeding-techniques>

² NHMRC – The National Health and Medical Research Council

Attitudes, beliefs and perceptions

- There is little evidence available, however Australian attitudes towards NBTs appear more positive than attitudes towards GM. This is also the case internationally.
- Levels of acceptability differ depending on the technique. Cisgenesis (defined as “introducing the genes of a plant of the same species”) and gene editing (defined as “making a small change to an existing gene within a plant”) are considered most acceptable, while transgenesis (defined variously as “introducing the genes of... a plant of a different species / a bacterium / an animal”) is considered less acceptable, with transgenesis from more distantly related donor species the least acceptable.
- The purpose to which NBTs are put also affects their level of acceptability. People are more accepting of uses that provide benefits for human health and the environment, and less accepting of uses that primarily benefit industry.
- There are inconsistent findings regarding the demographic characteristics most associated with support for NBTs. Age, gender and education have all been found to be both significant and non-significant predictors of support for NBTs.

Behavioural responses

- In Australia, one study found there was no significant difference between consumers’ willingness to pay or consume NBTs vs GM foods. Consumers’ willingness to consume food produced using either NBTs or GM was driven by perceptions of safety, environmental benefits and previous experience.
- Internationally, consumers were willing to pay more for food produced using NBTs than GM, but less than for food produced using conventional means. This was true for both processed and whole foods.

1.2.2 Focus groups (2021)

In July 2021, FSANZ commissioned the Food Values Research Group at the University of Adelaide to undertake focus groups on consumers’ responses to the use of NBTs in food production. Two asynchronous, online focus groups were undertaken over the course of three days with 79 participants (49 from Australia and 30 from New Zealand). The full report is available on FSANZ’s website.³ Key findings are outlined below.

Knowledge, information and awareness

- Self-reported knowledge and awareness of NBTs or GM is relatively low. Levels of knowledge and awareness of NBTs are lower than for GM.
- Australian participants reported a higher degree of knowledge about gene technology and NBTs than New Zealanders. New Zealand participants reported a higher degree of knowledge about GM than Australians.
- Participants wanted more information from independent, trusted sources about:
 - how NBTs would be used;
 - longer term effects on organisms, the environment, humans and the resulting food products;

³ Focus groups on consumers’ responses to the use of New Breeding Techniques in food production – <https://www.foodstandards.gov.au/food-standards-code/proposals/p1055-definitions-for-gene-technology-and-new-breeding-techniques>

- whether conventional varieties of food would be maintained and/or whether the technologies would be reversible; and
- whether the use of these technologies would result in increased costs to farmers or consumers.
- FSANZ was considered to be a trusted source of information, however to maintain credibility it was important for any information provided to be neutral.

Attitudes, beliefs and perceptions

- Participants did not view foods produced by NBTs as equivalent to conventional food, but on a spectrum with food produced using other forms of gene technology.
- The purpose for which NBTs are used matters. While participants raised general questions or concerns about the long-term effects of NBTs on the organisms, environment and humans, participants' attitudes differed according to the purpose, risks and benefits associated with a particular application of NBTs.
- The majority of participants were generally positive about the five potential applications of NBTs presented in the focus groups. Use of NBTs in crops (rather than in animals) and for health or environmental benefits (rather than cosmetic or purely economic benefits) tended to be the most accepted.
- There was, however, a level of distrust in the motivations of companies or producers that employ NBTs. Participants were concerned that some applications with potential environmental or animal welfare benefits could instead be used to increase yields or profits in a way that is ultimately harmful to the environment or animals.
- There was also a strong feeling that NBTs did not present the answer to systemic issues such as climate change or broader concerns about current agricultural practice and that 'lower tech' solutions should be considered.

Attitudes towards regulation

- There was a lack of knowledge about current regulation of GM foods, and regulation was rarely spontaneously raised by participants. However, when directly asked, participants felt that more regulation was a desirable outcome to ensure that NBTs were used in a manner in line with public expectations.
- Some participants also occasionally spontaneously expressed a preference for clear labelling of gene technology-related products. However, not all participants thought it was necessary or desirable where there was a lack of novel DNA in the final product.

1.2.3 Consumer survey (2022)

In July 2022, FSANZ undertook a survey to test the findings of the literature review and focus groups on a large, nationally representative sample. The survey sampled 1,000 Australians and 500 New Zealanders aged 18+ years, and was nationally representative by age, gender, and (Australia only) location. As the literature review and focus groups found that consumers tended not to distinguish between GM and NBTs but instead see them on a spectrum, the survey used the term GM foods to enhance its understandability. The full report is available on FSANZ's website.⁴ Key findings are outlined below.

⁴ Consumer Survey Report: Consumers' perceptions of and attitudes towards genetically modified foods – <https://www.foodstandards.gov.au/food-standards-code/proposals/p1055-definitions-for-gene-technology-and-new-breeding-techniques>

Knowledge, information and awareness

- Consumers have relatively low self-reported levels of knowledge about GM foods. Being university-educated and from New Zealand were the strongest predictors of having a higher level of self-reported knowledge about GM foods.
- Of those who reported knowing something about GM foods, two-thirds defined GM using a description that most closely aligned to genome editing.
- Around half of respondents wanted more information about GM foods, with government websites and newspapers or news websites the preferred sources.

Attitudes, beliefs and perceptions

- GM foods are not a top-of-mind food safety issue for the vast majority of consumers. Only 20% selected it as a top 3 food safety issue out of 11 options, despite a substantial minority believing that GM whole foods are already for sale in Australia/New Zealand.
- However, when asked, nearly half of respondents had some level of concern regarding GM foods. Key concerns were safety to humans, the trustworthiness of GM producers or scientists, environmental impact and animal welfare.
- Support for GM foods as a concept was mixed, with 30% supportive, 30% neutral, and 40% opposed. However, the uses to which GM technology is put matters. Respondents' views on specific applications were often substantially more positive than their view on GM foods overall. Respondents tended to be more supportive of GM applications in crops (rather than in animals) and for health or environmental benefits (rather than purely economic benefits).
- While being younger, male and tertiary educated was associated with higher levels of support for GM foods, trust in GM producers and scientists was a much stronger predictor of level of support for GM foods.

1.2.4 Consumer Insights Tracker (2023 and 2024)

Wave 1 (2023) results

In April 2023, FSANZ undertook its inaugural CIT, an annual survey of a nationally representative sample of approximately 2,000 consumers (1,200 from Australia and 800 from New Zealand). In Wave 1 of the survey, respondents were asked about their awareness of and confidence in gene-edited (GE) fruit and vegetables and gene-edited meat and dairy, as well as their top food safety concerns, which included GM foods as a response option. The full report is available on the FSANZ website.⁵ Key findings relevant to P1055 are outlined below.

- Consumers generally have low levels of awareness of GE fruit and vegetables, meat or dairy. 69% had either never heard of or knew little/nothing about GE fruit and vegetables, and 77% in respect of GE meat or dairy.
- Most consumers indicated they would not be confident in the safety of GE fruit and vegetables (57%) or GE meat or dairy (63%) if they became available for sale in Australia/New Zealand.
- GM foods or food ingredients was the second-least selected out of nine food safety concerns, with 20% of consumers selecting it as one of their top 3 concerns.

⁵ Consumer Insights Tracker 2023: Technical Report – <https://www.foodstandards.gov.au/science-data/social-science>

Wave 2 (2024) results

In April 2024, the second wave of the CIT was run. In Wave 2 of the survey, respondents were asked about their levels of awareness of and confidence in the GM banana that had recently been approved by FSANZ⁶ and food produced from precision fermentation (which involves the genetic modification of yeast, bacteria or fungi). It is important to note that the GM banana was not for sale at the time of the survey. The question around food safety concerns that was asked in Wave 1 was also repeated. The full report is forthcoming. Preliminary findings relevant to P1055 are outlined below.

- Consumers generally have low levels of awareness of the GM banana or food produced from precision fermentation. 80% of consumers had either never heard of or knew little/nothing about the GM banana, while 77% of consumers had either never heard of or knew little/nothing about precision fermentation.
- Around half of consumers indicated they would not be confident in the safety of the GM banana (52%) or food produced using precision fermentation (45%) if they became available for sale in Australia/New Zealand.
- If the GM banana became available for sale, 34% of consumers said they would purchase and consume it, 40% said they would not, and 27% were unsure.
- GM foods or food ingredients remain one of the least selected out of nine food safety concerns, with 23% of consumers selecting it as one of their top 3 concerns.

1.3 Conclusions

A number of common themes emerge across the findings from the three pieces of bespoke consumer research undertaken for P1055 (i.e. the literature review, focus groups, and consumer survey) as well as the data obtained from the CIT.

Australian and New Zealand consumers have low levels of awareness of and knowledge about NBTs

Australian and New Zealand consumers have consistently reported a low level of knowledge and awareness about NBTs across all of the research undertaken. The consistency evident across a range of different studies, including those with large, nationally representative samples, gives confidence in this finding.

However, while this level of knowledge has been reported as being lower than GM, it is important to consider this in the context of the lack of distinction that consumers tend to make between the definitions of NBTs and GM, seeing these as different forms of technology on a single spectrum (discussed further below). This may mean, as was evidenced in the consumer survey of perceptions around GM food, that people understand 'GM' in terms of techniques that are actually more aligned with NBTs (such as genome editing). The research reviewed has not generally asked consumers about their interpretation of these terms, and caution must therefore be taken in the reported *relative* level of knowledge and awareness of NBTs compared to GM, although the overall level of knowledge and awareness has generally been low for both.

⁶ Application A1274 – Food derived from disease-resistant banana line QCAV-4 – <https://www.foodstandards.gov.au/food-standards-code/applications/A1274-Food-derived-from-disease-resistant-banana-line-QCAV-4>

Consumers tend to view NBTs more positively than older forms of GM, but do not see them as equivalent to conventional food

Findings from the literature review and focus groups suggest that most consumers currently have a process-based understanding of NBTs, seeing them on a spectrum with GM as a more targeted version of older GM techniques. While this tends to lead to more positive attitudes towards NBTs compared to GM, it also means that consumers generally do not perceive food produced using NBTs as equivalent to conventional food, even if the resulting product is similar to what could have been achieved through conventional means.

This perception follows through into the prospective behaviour of consumers towards food produced using NBTs versus GM food and food produced using conventional means. Internationally, five different studies found that consumers were willing to pay more for food produced using NBTs than GM, but less than food produced using conventional means.⁷

Australian and New Zealand consumers have a nuanced perspective on the use of NBTs in food production, with greater levels of support for applications with clear health and/or environmental benefits

A key finding across all three pieces of research was that the uses to which NBTs are put matters. Consumers had a nuanced perspective on the use of NBTs in food production, with their level of support differing according to the purpose and perceived risks and benefits (and their distribution) associated with a particular application of NBTs.

The research consistently found that consumers tended to be more accepting of the use of NBTs in crops rather than animals, and for health and/or environmental benefits rather than for cosmetic or economic benefits. However, the focus groups found that this general trend was nuanced by a certain level of distrust in the motivations of companies or producers that employ NBTs, which consumers thought may undermine apparent societal benefits.

The importance of trust in producers and scientists was also borne out in FSANZ's GM consumer survey, which found that people who had higher levels of trust in GM producers and scientists were more likely to be supportive of GM foods. It appears that consumer acceptance of food produced using NBTs may be in large part contingent upon scientists and producers ensuring they are understood to be operating in good faith, and in ways that have an explicit and realised benefit for wider society. In the focus groups, when directly asked, a majority of respondents suggested that regulation was desirable to ensure that NBTs were used in a manner in line with these kinds of public expectations. However, levels of understanding of current regulation of GM foods were consistently low across the research.

Although not a top-of-mind food safety issue, a substantial proportion of Australian and New Zealand consumers still have concerns about the long-term effects of using gene technology in food production

GM foods and food ingredients have consistently been one of the least selected food safety issues among a nationally representative sample of Australian and New Zealand consumers

⁷ The systematic literature review found that, in Australia, there was no difference in consumers' willingness to pay for or consume NBT vs GM foods. However, this finding was based on only one study that examined willingness-to-pay in the context of glyphosate-resistant rice, and FSANZ's GM consumer survey found that glyphosate-resistance was not a trait that was highly valued by consumers (also see the finding on consumers' nuanced perspectives on use of NBTs in food production).

across three separate surveys (in 2022, 2023, and 2024). Across these surveys, 20-23% of respondents selected GM foods as a top three food safety issue out of 9 or 11 options.

However, this does not mean that Australian and New Zealand consumers do not have concerns about this technology. In the GM consumer survey, when directly asked, nearly half (46.7%) of respondents indicated that they had some level of concern about GM foods. Concerns were also raised during the focus group discussions, and around half of respondents in two separate waves of the CIT indicated a lack of confidence in the safety of GE and GM food and food produced from precision fermentation if it became available for sale in Australia or New Zealand.

Key consumer concerns centre around the long-term safety for humans, the long-term environmental impact, the consequences for animal welfare and the trustworthiness of GM producers or scientists (see above finding on the latter).

Consumers want more information about food produced using gene technologies, and government agencies and websites are a trusted source of information

A substantial proportion of consumers appear to want more information about the use of gene technology, whether GM or NBTs, in food production. Key areas in which they wanted more information was: how NBTs would be used; the long-term effects on organisms, the environment, and humans; whether conventional varieties would be maintained or the technology would be reversible; and whether the technology would result in increased costs to farmers and/or consumers.

Government agencies, including FSANZ, were considered to be an independent and credible source of information about gene technology used in food production. However, it is critical for any information provided to be perceived as neutral rather than biased in favour of gene technology for that credibility to be maintained.

Overall conclusions

Proposal P1055 represents a paradigm shift away from the process-based understanding and regulation of gene technology used in food production to an outcomes-based approach. While consumers generally have quite low levels of awareness and knowledge about NBTs, it appears that current understandings tend to align more closely with a process-based approach. Consumers tend to see food produced with NBTs on a spectrum with food produced using GM, rather than as being equivalent to conventional food. As a result of this process-based understanding, although not a top-of-mind food safety issue, a substantial proportion of consumers remain concerned about the long-term impact of these technologies on the environment, humans, animals, farmers' livelihoods and conventional food varieties.

Despite these concerns, consumers have a nuanced view of the use of NBTs in food production, with most consumers tending to support applications that have explicit benefits for human health and/or the environment. Long term acceptance of food produced using NBTs is thus likely to be contingent upon GM producers and scientists being understood to operate in good faith in ways that deliver these kinds of benefits broadly to society.

There appears to be an opportunity for consumer education. A substantial proportion of consumers want more information about the use of gene technology in food production, and consider FSANZ and other key government agencies such as CSIRO and the NHMRC to be trusted sources of information. It will be important to ensure any information provided is neutral, rather than biased in favour of gene technology, in order to maintain this trust and credibility.

It should also be noted when considering any form of consumer education that the scientific, outcomes-based understanding of food produced using NBTs as being potentially equivalent to conventional food may not find widespread agreement among the broader population, at least initially. It will therefore be important to consider attending to consumers' concerns about the long-term effects of using gene technologies from a process-based as well as an outcomes-based perspective.