



A1232 - Food derived from drought tolerant wheat line IND-00412-7

Submission to Application A1232

Champion Flour Milling Ltd (New Zealand) (Champion)

28 January 2022

Champion is a world class milling and bakery ingredients business which has traded in New Zealand for over 160 years. Operating from 2 manufacturing locations New Zealand, Champion is the largest processor of grains supplying processed grains, flours, bakery ingredients to large scale branded food manufacturers and bakery mixes to the major retailers, franchise outlets and food service outlets. Champion employs over 130 people in New Zealand.

As the oldest and largest processor of wheat into flour and flour related bakery ingredients in New Zealand, Champion is opposed to the application to Food Standards Australia and New Zealand (FSANZ) to approve the use of food derived from wheat line IND-00412-7, which has been genetically modified for tolerance to drought and the herbicide glufosinate, and FSANZ's decision to prepare a draft variation to amend Schedule 26 -3(4) of the Australia and New Zealand Food Standards Code (Code) to include a new item 'Wheat' as the commodity. The proposed variation would permit the sale and use of food derived from wheat line IND-00412-7, in accordance with the Code.

Champion's opposition to this application and proposed draft variation to the Code, is driven by the fact that Wheat is currently not a permitted food produced using gene technology, as outlined in Schedule 26-3(4) of the Code - Food Produced using Gene Technology. Approval of this variation would permit food derived from wheat line IND-00412-7 to be imported into Australia. These foods may include flour, bread, pasta, biscuits and other baked products.

The inclusion of Wheat in Schedule 26-3(4) of the Code is taking New Zealand's 'food standards' into uncharted territory. FSANZ acknowledges all genetically modified foods will only be approved after a comprehensive pre-market safety assessment. FSANZ has noted the HaHB4 protein has not previously been assessed, while the PAT protein has previously been assessed.

The safety assessment of wheat line IND-00412-7 in the Supporting Document 1, included consideration of the following key elements

- characterization of the transferred genetic material, its origin, function and stability in the wheat genome
- characterization of novel nucleic acids and protein in the food
- compositional analysis
- evaluation of intended and unintended changes
- assessment of the potential for any newly expressed protein to be either allergenic or toxic to humans.

Champion appreciates FSANZ conducted the safety assessment it utilizing the data package provided by the applicant, scientific literature and other similar applications. An independent assessment would be recommended.

In New Zealand, industry estimates show 332,000 metric tonnes of wheat is milled to provide 280,000 metric tonnes of flour for use in manufacture of bread, pasta, biscuit and other bakery products each year¹. New Zealand purchases wheat for milling into flour and grain products for the North Island food manufacturers from Australia. Food manufacturers in the South Island of New Zealand utilize flour



milled in the South Island using locally grown wheat. The Summary of the Assessment lists Trade Considerations as a factor in the approval of food derived from wheat line IND00412-7. In 2019, a well-documented drought impacted wheat quantity and quality in Australia, New Zealand imported 19 thousand tonnes of flour, which equates to less than 7% of New Zealand's flour usage in food manufacture. In a year without extreme drought conditions for wheat cropping in Australia, it is hypothesized the amount of imported wheat flour into New Zealand would be less than 19 thousand tonnes due to superior quantity and quality of Australian crop to meet the demand and quality parameters of New Zealand millers and food manufacturers.

The compositional analysis of wheat line IND-00412-7 versus Control showed statistical differences in Protein, amino acid Leucine and Zinc. With Protein a key functional property in manufacture of wheat flour based foods such as bread², there is limited food industry demand for imported wheat flour or wheat based foods. While the application facilitates trade, there is no benefit in supply or functionality to the New Zealand food industry, by permitting the sale and use of food derived from wheat line IND-00412-7.

Acknowledging the applicant has indicated there is no intention to apply for commercial cultivation of wheat line IND-00412-7 in New Zealand, and would require assessment and approval by the New Zealand's Environmental Protection Agency, and meet biosecurity requirements, the approval of food derived from wheat line IND00412-7 could progress to importation of the wheat line IND-00412-7 as seed. Allowing genetically modified wheat seed into New Zealand in an uncontrolled wheat supply chain, poses a significant risk to New Zealand's South Island wheat industry. If wheat line IND00412-7 were imported or to be grown in New Zealand there are no processes or infrastructure in place to segregate grain during handling, storage, shipping and processing, leaving New Zealand exposed to unintentional presence of genetically modified wheat in the grains, wheat, feed and food industries. This would have significant impact to the current clean, green, healthy image of New Zealand's agriculture and food value chains.

In addition to the New Zealand's lack of market demand for food derived from wheat line IND-00412-7 by New Zealand wheat and wheat flour industries, wheat related export flour markets, local food and feed industries, consideration must be given to New Zealand's attitude towards genetically modified foods.

In the systematic literature review conducted by Australian National University on Consumer Responses to the Use of New Breeding Technologies in the Production of Foods, commissioned by FSANZ, there were no peer reviewed papers that explored awareness, attitudes and behaviours towards new genetic breeding technology of New Zealanders³. However, two of points coming from the older papers in the review must be considered as an indicator of New Zealander's sentiment towards genetically modified foods. A survey of NZ farmers found intentions to purchase GM food was negative, even while acknowledging the benefits of gene technology³. Secondly, Bloomfield summarized the sentiments of New Zealand women who campaigned against genetic modification in foods, whilst not quantified it was clear genetic modification represented a clear boundary transgression³. This sentiment of New Zealanders reflected through a lack of understanding, engagement and communication poses a risk and must be taken into account before approving the food derived from wheat line IND-00412-7 and amending Schedule 26-3(4).

The need for longer term approach to the application of genetic modification in food is reinforced in two separate Mintel publications on the future of ingredients and gene-edited crops, respectively. Mintel



reported that genetic modification technologies hold huge promise to solve problems relating to health, taste and nutrition, that nature alone cannot solve. However, there is a need for scientific research, strict regulations and producers must deliver and communicate tangible benefits to reassure consumers of the safety of genetically modified crops for human consumption, if consumers are to accept the technology^{4,5}.

Acknowledging, the Code, Standard 1.5.2 - Food Produced using Gene Technology, clearly defines foods for sale in New Zealand may consist of, or have as an ingredient, a food produced using gene technology, and the requirements to label the food as 'genetically modified'. In market research conducted for Australia's National Gene Technology Scheme (2018) exploring attitudes towards genetic modified foods, respondents commonly mentioned genetic modification was not top of mind when they go shopping because labelling of foods containing genetically modified ingredients isn't something they typically see⁶. It is understood, this insight would be representative of shoppers in New Zealand.

Despite the requirement to label the foods derived from wheat line IND-00412-7, as containing ingredients that have been genetically modified, New Zealanders remain uninformed of the benefits of genetic modification but more importantly don't understand the technology. They clearly need to understand potential risks to health or environment through extensive trials and how a food containing genetically modified ingredients such as flour, bread, pasta, biscuits and other baked goods, would be labelled.

The approval of food derived from wheat line IND-00412-7, that has been genetically modified for drought tolerance and herbicide resistance, would be a first for New Zealand. With an intimate knowledge of grain processing, Champion appreciates any flour or derived ingredients, or foods manufactured for sale would contain novel DNA or novel protein, and therefore must be labelled as 'genetically modified' in conjunction with the name of the genetically modified food. Wheat flour and food derived from genetically modified wheat is unlike the current permitted foods produced using gene technology in Schedule 26-3, by virtue of the processing into ingredients or foods for consumption, such as oils and animal feeds. Therefore, the approval of foods derived from wheat line IND-00412-7, would have a more significant impact ultimately to the New Zealand consumer than those genetically modified crops, already approved in New Zealand.

As a result of New Zealanders lack of understanding of genetic modification and how it is used in food production, Champion opposes the amendment of Schedule 26-3(4) to include wheat and the approval of food derived from wheat line IND-00412-7, to be sold in New Zealand.

Champion's final concern with the application and proposed variation to Standard 26-3(4), is in relation to the final element of the safety assessment considerations, residues in foods and the potential for newly expressed proteins to be either allergenic or toxic.

The conclusion drawn in section 3.4 Characterisation of the inserted DNA and site(s) of insertion, states, multiple copies of the HaHB4, bar, gus and bla genes are present, either intact or incomplete, and due to a lack of fully intact or eukaryotic regulatory elements, the gus and bla genes were unlikely to be expressed and no protein products from the bla and gus genes are expected in the wheat line IND-00412-7. The report also states the bla gene is under the control of the bacterial promoter and lacks regulatory sequences that would be recognized in plants, while the gus gene is truncated and does not contain an intact promoter. However, using a transformation method, particle bombardment, there is a chance the gus and bla protein and genes, including the promoter and terminator, could be present as



fragments. If fragments or incomplete genes that include promoter-structural gene sequences were inserted into the current wheat chromosome unintentionally, unknown proteins may be produced in the plant cells. These proteins may show allergenicity and toxicity. While the bioinformatic analysis for potential allergenicity and toxicity has been conducted using databases of known protein and gene expression, the potential implication to health is unknown.

Given the safety assessment's lack of consideration for particle bombardment to produce fragments and potential expression of unknown protein material, Champion calls for further assessment to be undertaken to fully understand the implications to safety of this potential risk.

A further area of concern in relation to the safety assessment of novel substances are herbicide metabolites. While the assessment states FSANZ has reviewed the literature with respect to allergenicity and toxicity, evaluated the PAT sequence of the protein expressed in IND-00412-7, and that there are no new metabolites produced when wheat line IND-00412-7 is sprayed with glufosinate ammonium, approving food derived from a crop with herbicide tolerance continues to fuel the debate on herbicide tolerance or resistance as the assessment doesn't not outline nor comment on the amount of herbicide residue in the grain and ultimately in the food. While FSANZ references residues of agricultural chemicals permitted in food is governed by maximum residue levels⁷, there is no reference to the residues and respective levels expected to be found in the food derived from wheat line IND-00412-7 such as bran or flour from the endosperm, in the safety assessment. With the knowledge that herbicide tolerant GM crops have led to an increase in herbicide usage on farm⁸, the presence of levels of chemical residue in the foods derived from wheat line IND-00412-7 is a key consideration that has been overlooked in the information provided by the applicant and assessment. Having this data included in the safety assessment is consistent with FSANZ's approach to monitoring residues in ready to eat foods, to ensure levels are low and not pose any health concerns to consumers. In addition to the concern of residue levels in the foods derived from wheat line IND-00412-7 and potential health impact to the consumer, Champion asks that FSANZ acknowledges the well documented evidence summarizing negative impact of herbicide tolerant crops and related tolerance in weeds, to agronomy, farm practices, weed management and a reduction in biodiversity within the cropping area⁹.

With uncertainty surrounding the potential allergenicity, toxicity and potential chemical residues in all foods derived from wheat line IND-00412-7, New Zealand consumer 'hesitant' attitudes towards genetic modification of plants, specifically wheat to be used in food, and the low or no market demand for foods derived from genetically modified wheat, are three important considerations for FSANZ to revisit before approving the application and amendments to the Code.

In summary, Champion reinforces its opposition FSANZ's proposal to approve the application A1232 – Food Derived from Drought and Herbicide Tolerant Wheat Line IND-00412-7, and amend Schedule 26-3(4) of the Code to include 'Wheat' as the commodity to permit the sales and use in Australia. Key factors supporting Champion's position are

- inconclusive evidence that no unintentional unknown proteins are produced in the wheat grain from broken fragments of gus and bla genes that are generated during the particle bombardment process,
- the impact of herbicide tolerance on chemical residues, human health and the environment including biodiversity has not been considered
- lack of data on any chemical residues in the food (bran or endosperm) derived from wheat line IND-00412-7,



- consumer uncertainty to foods containing genetically modified ingredients,
- a potential longer term risk to the New Zealand's wheat industry caused by unintentional contamination of genetically modified wheat in the grains, wheat, feed and food industries and
- New Zealand food manufacturers have no wheat flour supply concerns, and wheat line IND-00412-7 does not provide any functional benefit to food manufacture.

There is no overall benefit from food derived from wheat line IND-00412-7, to the New Zealand food industry or consumer.

For further information in relation to this public comment, please contact

[REDACTED]

References

1. Allied Pinnacle Pty Ltd (2021) Internal Industry Data.
2. Bakerpedia (2021)
<<https://bakerpedia.com/ingredients/protein/#:~:text=Function&text=In%20baking%2C%20proteins%20perform%20as,of%20gluten%20in%20the%20flour>>.
3. Grant, WJ, Bray, H, Harms, R, Ankeny, RA, Leach, J. Consumer Responses to the Use of NBTs in the Production of Food: A Systematic Literature Review. Report to FSANZ, July 2021.
<<https://www.foodstandards.gov.au/code/proposals/Documents/NBT%20Literature%20Review.pdf>>.
4. Mintel (2021) The Future of Food Ingredients. <<http://mintel.com>>.
5. Mintel (2021) Gene-Edited Crops. <<http://mintel.com>>.
6. National Gene Technology Scheme. (2018) The Third Review of the National Gene Technology Scheme Final Report.
7. Food Standards Australia and New Zealand (2019)
<<https://www.foodstandards.gov.au/consumer/gmfood/pages/herbicides-in-gm-foods.aspx>>.
8. Department of Primary Industries and Regional Development, Government of Western Australia (2021) <<https://www.agric.wa.gov.au/grains-research-development/herbicide-resistance>>.
9. Schütte, G., Eckerstorfer, M., Rastelli, V., Reichenbecher, W., Restrepo-Vassalli, S., Ruohonen-Lehto, M., Wuest Saucy, A., & Mertens, M. Herbicide resistance and biodiversity: agronomic and environmental aspects of genetically modified herbicide-resistant plants. Environmental Sciences Europe. (2017) 29. 5