

**A submission on application A1232 – Food derived from drought-tolerant and herbicide-tolerant wheat line IND-011412-7.**

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**Submission from Murdoch University, WA State Agricultural Biotechnology Centre**

**Summary**

The amendment of the ANZFS Code to allow the inclusion of HB4 wheat in Standard 1.5.2 - Food Produced Using Gene Technology, is strongly supported.

The detailed supporting documentation on the trait, insert, compositional allergenicity and other analyses clearly demonstrate that wheat with the HB4 trait is safe for human consumption: a conclusion backed by regulators in Argentina and Brazil for HB4 wheat (and in other jurisdictions for HB4 soybean).

The glufosinate herbicide tolerance trait has been assessed by FSANZ and other regulatory bodies for more than 25 years: FSANZ has previously considered and approved 28 events for glufosinate tolerance in a number of crops, which firmly established that it does not raise toxicity or food allergenicity concerns in humans.

Food derived from HB4-wheat grain is therefore expected to have negligible nutritional impact compared to non-GM varieties.

This conclusion supports that provided by FSANZ Supporting Document 1 Safety Assessment, Application A 1232, Food derived from drought-tolerant and herbicide-tolerant wheat line IND-00412-7.

**Considerations**

All plant breeding involves genetic manipulation, and the definition of what is designated as GM in Australia is based on the process used to develop the final product rather than the actual properties of that product.

Wheat is the most important crop in Australia, but advances in crop production have been low compared to other major world crops such as soybean, maize, canola and cotton. A significant difference is that GM technologies have been applied to the latter, such that more than 10% of the world's food crops are genetically modified (GM). However, these powerful new technologies, which are making a substantial contribution to national and world food security have not, until now, been applied to wheat.

Trigall Genetics, a JV between Bioceres Crop Solutions and Florimond Desprez, has pioneered the development of GM wheat in South America, principally in Argentina. In 2021, more than 60,000 Ha of wheat line IND-011412-7 ('HB4 wheat', the HB4 gene was derived from sunflower) has been grown in Argentina and Uruguay. The benefit of this line is that it can confer up to a 20% increase in

the yield of wheat under conditions of water stress, without a yield penalty when water is not limiting. This property is of great interest to any country in which drought is a limiting factor, since wheat line IND-011412-7 can contribute to drought resilience in wheat production. It also has the attribute of tolerance to the herbicide glufosinate, providing an additional useful practical approach to weed control. The HB4 elements described in the submission are located at a single locus.

It is notable that the HB4 trait has also been introduced into soybean for commercial use in this crop in a number of countries.

Noting that this application is for the approval for sale and use of food from GM-derived wheat line IND-011412-7, and not for its growth in Australia, Trigall Genetics has provided very detailed analyses in a 107 page application to FSANZ. The latter includes detailed information on the development of Ind-HB4 wheat, including bioinformatic studies, molecular details, characterisation, integration structure, field trials and field performance, and compositional analyses (e.g. degradation on ingestion, possible allergenicity etc) in relation to human consumption, health and safety.

Mean values of 43 analytes were measured in wheat grains – statistically significant differences in 3 analytes were within the normal ranges of non-GM varieties, taking into account normal site and environment-related variations.

Overall, analysis of HB4 wheat revealed no biologically relevant differences compared to conventionally manipulated varieties, except for the intended traits of improved drought resilience and herbicide tolerance. Food derived from HB4-wheat grain is therefore expected to have negligible nutritional impact compared to non-GM varieties.

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