

Executive summary

The present application seeks to amend Schedule 18—Processing aids of the Australia New Zealand Food Standards Code (the Code) to approve a glucoamylase enzyme preparation produced by Novozymes.

Proposed change to Australia New Zealand Food Standards Code - Schedule 18—Processing aids

Schedule 18—Processing aids is proposed to be amended to include a genetically modified strain of *Aspergillus niger* expressing a glucoamylase from *Penicillium oxalicum* as permitted source for glucoamylase.

The application is applied for assessment by the general procedure.

Description of enzyme preparation

The enzyme is a glucan 1,4-alpha-glucosidase (EC 3.2.1.3), commonly known as glucoamylase.

Glucoamylase catalyses the hydrolysis of (1→4)- α - as well as (1→6)- α -linkages in the starch polysaccharides amylose and amylopectin.

The enzyme is produced by submerged fermentation of an *Aspergillus niger* microorganism expressing a glucoamylase from *Penicillium oxalicum*.

The glucoamylase enzyme preparation is available as a liquid preparation complying with the JECFA recommended purity specifications for food-grade enzymes.

The producing microorganism, *Aspergillus niger*, is absent from the commercial enzyme product.

Use of the enzyme

The glucoamylase enzyme preparation is used as a processing aid in baking processes, brewing processes and starch processing for glucose syrups production and other starch hydrolysates. Generally, glucoamylase degrade starch into D-glucose.

- during baking processes the glucoamylase degrades starch and dextrans into glucose that can be fermented by yeast.
- during brewing processes the glucoamylase degrades starch into fermentable sugars.
- during starch processing to produce syrups the glucoamylase degrades polysaccharides into glucose.

Benefits

The benefits of the action of the glucoamylase in baking processes are:

- Reduced baking time and yeast boosting
- Uniform and slightly increased volume and enhanced crust colour of the bakery product
- More uniform and predictable production of glucose

- Improved fermentability
- Uniform colour

The benefits of the action of the glucoamylase in brewing processes are:

- More uniform and predictable production process and brewing yield including the possibility to control the desired level of fermentable sugars at every production

The benefits of the action of the glucoamylase in starch processing for glucose syrups production and other starch hydrolysates are:

- Efficient degradation of dextrans and production of glucose
- Reduced risk of microbial contamination because the enzyme can be used at high operating temperature
- Stable process allowing for variations in pH and temperature
- More pure product compared to a acid-acid process

Safety evaluation

The safety of the production organism and the enzyme product has been thoroughly assessed:

- The production organism has a long history of safe use as production strain for food-grade enzyme preparations and is known not to produce any toxic metabolites.
- The genetic modifications in the production organism are well-characterised and safe and the recombinant DNA is stably integrated into the production organism and unlikely to pose a safety concern.
- The enzyme preparation complies with international specifications ensuring absence of contamination by toxic substances or noxious microorganisms
- Sequence homology assessment to known allergens and toxins shows that oral intake of the glucoamylase does not pose food allergenic or toxic concern.
- Two mutagenicity studies *in vitro* showed no evidence of genotoxic potential of the enzyme preparation.
- An oral feeding study in rats for 13-weeks showed that all dose levels were generally well tolerated and no evidence of toxicity.

Furthermore, the safety of the glucoamylase preparation was confirmed by external expert groups, as follows:

- Denmark: The enzyme preparation was safety assessed resulting in the authorisation of the enzyme product by the Danish Veterinary and Food Administration.

Conclusion

Based on the Novozymes safety evaluation, confirmed by the above-mentioned bodies, we respectfully request the inclusion of the glucoamylase in Schedule 18—Processing aids.