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199-22

Approval Report – Application A1233

2'-FL from new GM source for infant formula

Food Standards Australia New Zealand (FSANZ) has assessed an application by Friesland Campina Ingredients seeking to permit the sale and use of 2'-fucosyllactose (2'-FL) derived from a new genetically modified *Escherichia coli* (*E.coli*) strain as a nutritive substance in infant formula products.

On 6 December 2021, FSANZ sought [submissions](#) on a draft variation and published an associated report. FSANZ received 8 submissions.

FSANZ approved the draft variation on 27 April 2022. The Food Ministers' Meeting (formerly the Australia and New Zealand Ministerial Forum on Food Regulation) was notified of FSANZ's decision on 6 May 2022.

This Report is provided pursuant to paragraph 33(1)(b) of the *Food Standards Australia New Zealand Act 1991* (the FSANZ Act).

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Supporting document

The [following document](#) which informed the assessment of this application is available on the FSANZ website:

SD1 Risk and safety assessment report (at Approval)

Executive summary

Food Standards Australia New Zealand (FSANZ) has assessed an application by Friesland Campina Ingredients (the applicant) to amend the Australia New Zealand Food Standards Code (the Code) to permit the sale and use of 2'-fucosyllactose¹ (2'-FL) derived from a genetically modified *Escherichia coli* (*E. coli*) strain, *E. coli* K-12 as a nutritive substance in infant formula products (IFP) i.e. infant formula, follow-on formula and infant formula products for special dietary use. The application also requested an amendment to Schedule 3 of the Code to reference or include a specification published by the European Union (EU) for this source of 2'-FL.

The Code already permits the addition of 2'-FL as a nutritive substance to IFP. However, this permission does not apply to the 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* which is a different genetically modified source organism compared to the previous permission. The application therefore seeks to amend Schedule 26 to permit this alternative genetically modified source organism for the production of 2'-FL by fermentation under the brand name 'Aequival® 2'-FL'.

2'-FL derived from the production strain is chemically and structurally identical to 2'-FL isolated from human milk. Stability studies demonstrate that the final product is suited for food uses. The application proposed specifications based on those already in force in the EU and submitted data that demonstrates the final product is within these specifications. Noting the most recent EU specifications are from 2019, FSANZ has confirmed the applicant's product can meet these updated specifications.

FSANZ found no safety concerns with the production organism. *E. coli* K-12 has a long history of safe use to produce recombinant proteins and does not pose a risk to humans. The assessment confirmed the transferred genetic material is both stable and fully functional.

FSANZ previously found no safety concerns associated with the addition of 2'-FL to IFP at concentrations within the range of naturally occurring levels in human milk. Newly available information did not change this conclusion. In addition, 2'-FL is unlikely to pose allergen concerns because the protein content of the 2'-FL product is below the limit of quantitation.

FSANZ's previous assessments found no evidence of a nutritional concern at concentrations typically observed in human milk. No new information was provided that would indicate a need to change these conclusions. The evidence for a beneficial role of 2'-FL in the normal growth and development of infants will be reassessed in a review to be completed by March 2026.

Following assessment and preparation of the draft variation, FSANZ called for submissions regarding the draft variation from 6 December 2021 to 31 January 2022. Eight submissions were received, all of which FSANZ had regard to (see Section 2.1 of this report for details of submissions made).

Based on the information above and other relevant considerations set out in this report, FSANZ has decided to approve the draft variation proposed following assessment with amendments. The approved draft variation will permit the voluntary addition of the applicant's 2'-FL to IFP, subject to the following Code requirements and conditions:

¹ Also known as 2'-O-fucosyllactose

- It may be added up to a maximum level of 2.4 g/L as consumed (i.e. in powder or liquid form).
- The existing prohibition for the use of 2'-FL with galacto-oligosaccharides and inulin-type fructans will apply to IFP that contain the applicants 2'-FL.
- The existing prohibition for the use of the words 'human milk identical oligosaccharide' or 'human milk oligosaccharide', and abbreviations 'HMO', 'HiMO', or any word or words or abbreviations having the same or similar effect, will apply to IFP that contain the applicant's 2'-FL.
- An exclusive permission to use the applicant's 2'-FL will apply for a period of 15 months, linked to the applicant's brand name 'Aequival® 2'-FL', commencing on the date of gazettal of the approved draft variation.
- Schedule 3 of the Code will set specification for the applicant's 2'-FL, with which it must comply.
- The permission is subject to the outcome of the five year review¹ (to be completed by March 2026) which will reassess the evidence of a substantiated beneficial role of 2'-FL in the normal growth and development of infants.

The amendments made to the draft variation at approval were to set a new single specification for 2'-FL sourced from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*. The new specification harmonises the existing specification for *E. coli* K-12 from *Helicobacter pylori* with the new specification for the applicant's production strain. It is also consistent with the relevant EU specification. FSANZ considers the new single specification provides greater clarity in the Code.

1 Introduction

1.1 The applicant

Friesland Campina Ingredients supplies consumer products, products for the professional market and ingredients and semi-finished products for manufacturers of infant nutrition, the food industry and the pharmaceutical sector.

1.2 The application

The application sought to:

- amend Schedule 26 of the Australia New Zealand Food Standards Code (the Code) to permit the sale and use of 2'-FL from *E. coli* K-12 strain E997 containing the gene alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* as a nutritive substance in infant formula products (IFP)², and
- amend Schedule 3 of the Code to reference or include the specification for 2'-FL from *E. coli* K-12 published by the European Union (EU), set out in the first column of the table in the annex to the Commission Implementing Regulation (EU) 2019/388³.

Schedule 26 of the Code already contains a permission for the addition of 2'-FL as a nutritive substance to IFP. However, Schedule 26 does not currently list the applicant's genetically modified organism (*E. coli* K-12 strain containing the gene alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*) as a permitted source organism for the production of 2'-FL by fermentation.

1.3 The current Standards

1.3.1 Australia and New Zealand

Australian and New Zealand food laws require food for sale to comply with relevant requirements in the Code. The requirements in the Code relevant to this application are summarised below.

1.3.1.1 Permitted use

Paragraphs 1.1.1—10(5)(c) and (6)(g) of Standard 1.1.1 require that, unless expressly permitted, a food for sale must not be a *food produced using gene technology*, or have as an ingredient or component a *food produced using gene technology*.

2'-FL produced using *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* is *food produced using gene technology* (section 1.1.2—2) as it is derived from an organism modified using gene technology (i.e. derived from genetically modified (GM) *E. coli* strains). If approved, express permission for the 2'-FL derived from this

² Including infant formula, follow-on formula and infant formula products for special dietary use.

³ https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019R0388&from=EN#ntr5-L_2019070EN.01002101-E0005

production strain is required in accordance with Standard 1.5.2 (i.e. if it is listed in Schedule 26 and complies with any corresponding conditions).

In addition, paragraph 1.1.1—10(6)(b) of Standard 1.1.1 requires that, unless expressly permitted, a food for sale must not have as an ingredient or component a substance that was *used as a nutritive substance* (section 1.1.2—12). 2'-FL produced using *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* is used as a nutritive substance because its addition to food is intended to achieve specific nutritional purposes. 2'-FL is permitted to be *used as a nutritive substance* in accordance with Standard 2.9.1 (i.e. be listed in the table to section S29—5; and be in a permitted form at up to the maximum amount per 100 kJ specified in that table). Section S29—5 permits the use of 2'-FL as a nutritive substance in accordance with Standard 1.5.2 (i.e. if it is listed in the table to section S26—3; and complies with any corresponding conditions listed in that Schedule).

1.3.1.2 Identity and purity

Section 1.1.1—15 requires that a substance that is *used as a nutritive substance* must comply with any relevant identity and purity specification set out in Schedule 3. The application proposed a specification for the 2'-FL produced using *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* for this purpose.

1.3.1.3 Infant formula products

The composition of infant formula is regulated in Standard 2.9.1 and Schedule 29. This standard (and associated schedule) sets out specific compositional and labelling requirements for the following IFP:

- infant formula (for infants aged 0 to <12 months)
- follow-on formula (for infants aged from 6 to <12 months)
- infant formula products for special dietary use (for infants aged 0 to <12 months).

1.3.1.4 Labelling requirements

Paragraph 1.1.1—10(8) requires that food for sale must comply with all relevant labelling requirements in the Code for that food. In addition to specific labelling requirements in Standard 2.9.1, including for declaring nutrition information and provisions on prohibited representations, the following general labelling requirements also apply:

- Standard 1.2.4 generally requires food products to be labelled with a statement of ingredients.
- Standard 1.2.7 sets out the requirements and conditions for voluntary nutrition, health and related claims made about food. Paragraph 1.2.7—4(b) states a nutrition content claim or health claim must not be made about an IFP.
- Section 1.5.2—4 sets out labelling requirements for foods for sale that consist of, or have as an ingredient, food that is a *genetically modified food*. A *genetically modified food* is defined in subsection 1.5.2—4(5) as a *food produced using gene technology* that contains novel DNA or novel protein; or is listed in section S26—3 as subject to the condition that its labelling must comply with section 1.5.2—4.

1.3.1.5 Current oligosaccharide permissions and restrictions

The ingredient under assessment is a non-digestible oligosaccharide. This section summarises the current permissions and restrictions in the Code relating to oligosaccharides.

The Code currently regulates the addition of galacto-oligosaccharides (GOS) and inulin-type fructans (ITF) (both are defined in subsection 1.1.2—2) to IFP (see section 2.9.1—7). GOS and ITF are also permitted in general foods by their specific exclusion from the definition of *used as a nutritive substance* in section 1.1.2—12 and general provisions in section 1.1.1—10. ITF includes substances such as fructo-oligosaccharides (FOS), short-chain FOS (scFOS), oligofructose and inulin (FSANZ 2013). Unlike 2'-FL, ITF are not present in human milk and GOS is found only in trace amounts (FSANZ 2008).

For IFP, section 2.9.1—7 sets out restrictions on the addition of ITF and GOS to IFP. Subsection 2.9.1—7(1) permits the addition of ITF alone (up to 110 mg/100 kJ), GOS alone (up to 290 mg/100 kJ), or ITF and GOS combined (up to 290 mg/100 kJ, with no more than 110 mg/kJ of ITF). These amounts were converted to the respective mg/100 kJ units for Code purposes from 8 g/L of GOS (alone or combined with ITF) and 3 g/L of ITF. Subsection 2.9.1—7(2) prohibits the use of ITF and/or GOS in IFP with 2'-FL either alone; or in combination with lacto-N-neotetraose (LNnT).

1.3.2 Regulation in other countries

1.3.2.1 2'-FL

2'-FL produced by microbial fermentation and by chemical synthesis is permitted for use in IFP equivalent products and many other foods in at least 37 overseas countries at a range of levels. Table 1 outlines some international permissions for 2'-FL alone. When permitted for use with LNnT, these levels are reduced.

Table 1: International permissions for use of 2'-FL in infant formula*

Country	Max. use level (g/L)
United States	2.4
Canada [#]	1.2
Singapore	1.2
European Union	1.2
Israel	2.0
Korea	2.0
Philippines	1.2

Notes to table: *Infant formula categories vary between countries
[#] Permission as novel food with support for use in infant formula

Labelling permissions and restrictions differ across countries. Some specify the terminology that must be used for the ingredients on labels while others do not. Some countries permit nutrition and health claims on IFP while other countries do not.

The current Codex Alimentarius Standards for Infant Formula and Formulas for Special Medical Purposes Intended for Infants ([Codex Standard 72-1981](#)) and for Follow-up Formula⁴ ([Codex Standard 156-1987](#)) do not contain specific provisions for 2'-FL. However, the standards contain provisions for 'optional ingredients' which would apply to the addition of substances such as 2'-FL.

1.3.2.2 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-

⁴ 'Follow-up Formula' is currently defined by Codex as *a food intended for use as a liquid part of the weaning diet for the infant from the 6th month on and for young children (12-36 months)*.

fucosyltransferase from Bacteroides vulgatus

2'-FL derived from the production strain has received EU novel food approval.

The Novel Foods Unit (Ministry for Medical Care, Netherlands) has determined that the 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* is substantially equivalent to a synthetic 2'-FL previously authorised in the EU (EFSA 2015)⁵.

In the United States of America (US), the Food and Drug Administration (FDA) has responded with 'no questions' to the applicant's self-assessment that 2'-FL derived from *E. coli* K-12 strain E997 is Generally Recognized As Safe (GRAS).⁶

1.3.3 Specifications in the EU

The Commission Implementing Decision (EU) 2017/2201 authorised the use of 2'-FL produced with *E. coli* strain BL21 as a novel food ingredient. Further to this, the Commission Implementing Regulation (EU) 2019/388 of 11 March 2019 authorised a change of the specifications for 2'-FL derived from *E. coli* K-12, including the applicant's production strain and the *E. coli* K-12 production strain permitted through application A1155 - 2'-FL and LNnT in infant formula and other products. The specification is provided in a table in the annex of the regulation. Separate specifications for 2'-FL derived from *E. coli* BL21 are set out in the same annex.

1.4 Reasons for accepting the application

The application was accepted for assessment because:

- it complied with the procedural requirements under subsection 22(2) of the *Food Standards Australia New Zealand Act 1991* (FSANZ Act)
- it related to a matter that warranted the variation of a food regulatory measure.

1.5 Procedure for assessment

The application was assessed under the General Procedure.

1.6 Decision

The draft variation as proposed following assessment was approved with amendments. The amendments were to consolidate two separate specifications for host organism *E. coli* K-12 into one new specification in Schedule 3 of the Code that lists permitted sources to the gene-donor level. Specifically, the amendments will repeal section S3—40 *Specification for 2'-fucosyllactose sourced from Escherichia coli K-12* and substitute it with a new section and specification containing parameters consistent with the 2019 EU specification for 2'-FL derived from *E. coli* K-12. This new specification will apply to all forms of 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus* and permitted by Schedule 26. The variation takes effect on

⁵ Commission Implementing Regulation (EU) 2017/2470 [EUR-Lex - 32017R2470 - EN - EUR-Lex \(europa.eu\)](#)

⁶ GRAS Notice (GRN) No. 735 <https://www.fda.gov/media/115365/download>

Gazetta. The approved draft variation is at Attachment A.

The related explanatory statement is at Attachment B. An explanatory statement is required to accompany an instrument if it is lodged on the Federal Register of Legislation.

The draft variation on which submissions were sought is at Attachment C.

2 Summary of the findings

2.1 Summary of issues raised in submissions

FSANZ received eight submissions during the A1233 call for submissions period. Three submissions were from industry, three from industry representative bodies and two from jurisdictions.

- All submissions support a permission to add 2'-FL derived from the production strain to IFP.
- Submitters raised no issues with the FSANZ safety assessment.
- Submitters raised no issue with giving the applicant exclusivity.
- Submission from jurisdictions noted and supported the approach to risk management.
- Submissions from industry and industry representative bodies raised some issues with existing requirements for oligosaccharides in infant formula products and the identity and specifications for 2'-FL derived from the productions strain.

Issues raised are summarised in Table 2.

Table 2: Summary of issues

Issue	Raised by	FSANZ response
Addition of 2'-FL to FSFYC Some submitters wanted permissions extended to FSFYC	AFGC, INC, Nutricia, NZFGC	The application did not seek permission to add 2'-FL derived from <i>E. coli</i> K-12 containing the gene for alpha-1,2-fucosyltransferase from <i>Bacteroides vulgatus</i> to FSFYC.
Review benefit of 2'-FL in IFP Two submitters highlighted the importance to reviewing the benefit assessment of 2'-FL in IFP	NZFS, Vic Dep. Health	Noted. At the request of Food Ministers, FSANZ is to carry out a five year review (to be completed by March 2026) of the evidence of a substantiated beneficial role of 2'-FL in the normal growth and development of infants.
Existing prohibition on the use of the words 'human milk identical oligosaccharide' or 'human milk oligosaccharide', and abbreviations 'HMO', 'HiMO', or any word or words or abbreviations having the same or similar effect	AFGC, INC, NZFGC, Nutricia	The applicant did not request a change to the existing prohibition, therefore a review of this prohibition is not in scope. FSANZ notes that the labelling requirement aligns with the regulatory approach for prohibiting HMO terminology that

<p>Industry submitters opposed the existing prohibition on the use of the words ‘human milk identical oligosaccharide’ or ‘human milk oligosaccharide’, and abbreviations ‘HMO’, ‘HiMO’, or any word or words or abbreviations having the same or similar effect on the labels of IFP for the following reasons:</p> <ul style="list-style-type: none"> - it conflicts with generic ingredient naming provisions - these terms would be limited to the statement of ingredients and nutrition information statement for IFP and their use would not be for promotional purposes - ignores existing protections in the Code (e.g. prohibitions in section 2.9.1—24) and in consumer protection legislation - the terms have a long history of use in the scientific literature - the terms are more easily understood by consumers and it may be more misleading and deceptive to prohibit them - it is contrary to the provision of adequate information to enable consumers to make informed choices - ignores international standards (e.g. the EU and U.S.) that allow such terms, creating an inconsistency - it has the potential to constrain innovation and create trade barriers. A requirement for unique domestic labelling restricts imports (and hence availability of products to consumers) and increases export costs - increases labelling costs 		<p>was described in the Approval Report for A1155 2'-FL and LnNT in infant formula and other products and gazetted in March 2021.</p> <p>FSANZ also notes its more recent published responses to similar concerns from industry submitters. See, for example, Table 1 to section 2.1 in the Approval Report for A1190 2'-FL in infant formula and other products.</p>
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<p>Microbiological and heavy metal specifications for 2'-FL</p> <p>Industry submitters posited that microbiological criteria and limits for heavy metals are not needed in specifications, unless there is a specific reason. It is the manufacturers responsibility to assess microbiological suitability of ingredients.</p> <p>In some industry submitter opinions, there is an inconsistent approach in Schedule 3 - microbiological (and other) criteria are included in some cases and not others. This also applies to other parameters.</p> <p>It is not clear how FSANZ decides what parameters are included in specifications and submitters call for a more consistent approach.</p>	<p>AFGC, INC, NZFGC</p>	<p>FSANZ acknowledges differences in some microbiological and other criteria exist between specifications in Schedule 3. However, the broader issues relating to parameters set by Schedule 3 are out of scope for this application.</p> <p>See also the responses below and Section 3.2 of this report.</p>
<p>Manufacturers specifications compared to specifications from other sources</p> <p>The submitter notes that FSANZ has previously stated that identity and purity specifications are provided by the applicant and based on their proprietary manufacturing process. However, the proposed purity specifications are more liberal than the applicants own specifications. The specifications should be changed to align with the proprietary manufacturing process apparent in the batch data. This would be consistent with A1155 and A1190 where the manufacturer's specification was adopted.</p>	<p>DSM, Nestle</p>	<p>FSANZ acknowledges that specifications for A1155 and A1190 aligned with manufacturing processes of those specific 2'-FL products however it is not a requirement for FSANZ to base the specification on a proprietary manufacturing process. The purpose of a Schedule 3 specification is to set minimum standards relating to a particular substance's purity and identity to ensure the safe use of that substance.</p> <p>As requested in the application, FSANZ assessed the applicants 2'-FL product against the EU specification (see SD1). That assessment confirmed that the final product is consistently within the proposed specification.</p> <p>For more information, see section 3.2 of this report.</p>
<p>Harmonisation and consistency of specifications and definitions</p>	<p>AFGC, INC, DSM, Nutricia, Nestle, NZFGC</p>	<p>Post consultation, and for the reasons set out in this report, FSANZ determined the best approach is to adopt a single specification with parameters in line with the 2019</p>

<p>Industry submitters recommend one entry for 2'-FL from microbial sources with one definition. This is the case in the EU novel food list in which 2'-FL from microbial sources has one definition, followed by information relating to the two permitted sources.</p> <p>A common specification could be adopted for all 2'-FL from <i>E. Coli</i> K-12 simplifying regulations for jurisdictions and industry and minimising future resources and costs for all parties. This is particularly true if the list of approved sources continues to expand.</p> <p>In the EU, specifications are not restricted by the donor gene but only by the host organism. In this application, FSANZ is proposing specifications that are restricted by both (<i>E. coli</i> K-12 and <i>Bacteroides vulgatus</i>). However, the EU specifications that form the basis of the proposed specifications are not representative of the applicants 2'-FL at the donor organisms level.</p>		<p>EU specification for <i>E. coli</i> K-12 2'-FL sources that are permitted under Schedule 26 (i.e. at the gene donor organism level).</p> <p>Batch analyses of the 2'-FL products from <i>E. coli</i> K-12 have been found to consistently comply with this less restrictive EU specification.</p> <p>For more information, see section 3.2 of this report.</p>
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2.2 Food technology and safety assessment

The Code already permits 2'-FL from different production strains for addition to IFP. The maximum permitted level is 96 mg/100 kJ, equivalent to 2.4 g/L. The purpose of the present assessment is therefore to assess the safety of 2'-FL derived from the applicant's production strain.

2'-FL derived from the production strain is chemically and structurally identical to the naturally occurring substance isolated from human milk. Stability studies conducted by the applicant demonstrated that the final product is suited for the intended food uses. The applicant has proposed specifications for Schedule 3 of the Code, based on those established in the EU. Multi-batch analyses showed that the final product is consistently within the proposed specifications, with impurities and/or contaminants resulting from the fermentation process either minor or absent.

E. coli K-12 has a long history of use for the production of recombinant proteins and does not pose a risk to humans. Analyses of the gene donors also confirmed there were no safety concerns. Characterisation of the production strain confirmed the expression plasmid carrying the α -1,2-fucosyltransferase gene was both genetically stable and fully functional.

FSANZ has previously determined that there are no safety concerns associated with the addition of 2'-FL to IFP at concentrations up to 2.4 g/L, which is within the range of naturally occurring levels in human milk from the majority of women (0.6 – 7.8 g/L). Newly available information relating to previously assessed studies of 2'-FL produced by the applicant and another manufacturer did not indicate a reason to change this conclusion.

2'-FL was not genotoxic *in vitro* or *in vivo*. No adverse effects were observed in multiple subchronic oral toxicity studies in neonatal rats at doses up to 5000 mg/kg bw/day, or in juvenile and adult rats at doses > 7000 mg/kg bw/day. Three-week studies with neonatal piglets administered formula containing 2'-FL at concentrations up to 4 g/L also found no adverse effects. In human studies, infant formula supplemented with 2'-FL was well tolerated with no significant increases in adverse events. 2'-FL was also well tolerated in studies with children and adults. The proposed specification for 2'-FL derived from the host organism *E. coli* K-12 containing the gene donor from either *Helicobacter pylori* or *Bacteroides vulgatus* does not raise any safety concerns.

2'-FL is unlikely to pose an allergenicity concern because the protein content of the 2'-FL product is below the limit of quantitation.

FSANZ's previous assessments of 2'-FL found no evidence of a nutritional concern at concentrations typically observed in human milk. No new information was provided that would indicate a need to change these conclusions.

3 Risk management

Breastfeeding is the recommended way to feed infants. As infants are a vulnerable population group, a safe and nutritious substitute is necessary when breastfeeding is not possible. Before a change in the composition of IFP is permitted, there must be evidence that the change would not pose a risk to the health and safety of consumers of these products, in this case, infants.

3.1 Consideration of the assessment and final approach

The application sought permission for the production strain to be *used as a nutritive substance* in IFP.

The production strain is a *food produced using gene technology* for Code purposes as it is derived from 'an organism that has been modified using gene technology'.

The approved draft variation will permit the voluntary addition of 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* to IFP. The approved draft variation does not specify the applicant's specific *E. coli* K-12 strain (i.e. E997) to be used as the production organism as this is not necessary from a safety perspective. Specifying only the host and donor organisms provides greater flexibility for strain improvement and is consistent with existing permissions in the Code for 2'-FL.

Given 2'-FL derived from the production strain is a *food produced using gene technology*, and noting the applicant did not request any changes to current permissions in the Code for 2'-FL, FSANZ considers that 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* meets requirements under Standard 2.9.1 and Schedule 29 to be used as a nutritive substance at the permitted level of 96 mg/100 kJ in IFP.

3.2 Specification for permitted 2'-FL from *E. coli* K-12

All 2'-FL products assessed by FSANZ to date have had unique specifications related to an applicant's proprietary manufacturing processes. This reflects in part statutory application requirements which state that certain applications (eg, one seeking a nutritive substance permission) should include a proposed specification where there is no relevant specification identified in Schedule 3.

Specifications included in applications are assessed by FSANZ in accordance with the FSANZ Act. FSANZ, for example, has regard to the proposed specification in its safety assessment and assesses it in terms of safety, intended purpose and efficacy. This process includes consideration of the specific parameters requested by the applicant in the specification; whether these are consistent with safe use and intended purpose; and whether a product complying with the requested specification can meet requirements in the Code. One purpose in setting a specification is to establish a minimum standard to enable the safe use of a substance (e.g. purity requirements, limits for contaminants).

To date, specification provided with applications have generally reflected the particular manufacturing process for the applicant's product.

In this case, the applicant requested that the specification established by the EU in 2016 be set for their product.

The most recent EU specification was published in 2019 and FSANZ therefore assessed the applicant's multi-batch analyses against it. The assessment demonstrated that the final product is consistently within the 2019 EU specification.

We acknowledge stakeholder concerns raised during the call for submissions, including that the current requirement to set individual specifications for similar 2'-FL products could be simplified, and have thus sought to clarify our regulatory approach.

FSANZ considered 2'-FL from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Helicobacter pylori* (S3—40) against the EU specification (see SD1, *Table 2.3 Comparison of specifications for 2'-FL produced from genetically modified E. coli K12*) and identified the final product is consistently within the proposed specification. FSANZ has considered harmonisation with the EU specification to the extent that is appropriate for the Australia New Zealand regulatory system (including the FSANZ Act requirements) and the Code. FSANZ also consulted the A1155 applicant regarding the change to 'their' specification and that they had no objection.

The approved draft variation will repeal section S3—40 and substitute it with a new section and specification containing parameters consistent with the 2019 EU specification. This specification is for 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Bacteroides vulgatus* or *Helicobacter pylori* (ie, as permitted under Schedule 26). This approach assures public health and safety because a manufacturer seeking to sell 2'-FL from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from a donor organism other than *Bacteroides vulgatus* or *Helicobacter pylori* is still required to seek permission under Schedule 26 of the Code. However the need for multiple specifications for similar 2'-FL products (i.e. from the same host organism) is removed, thus providing clarity in the Code.

3.3 Exclusivity

An applicant may request exclusive permission to use and sell a food (including a substance) for a certain period of time to recognise the investment made in developing the food or ingredient or nutritive substance and the need to achieve return on this investment, thereby supporting innovation. The applicant has requested an exclusive use permission for their specific brand of 2'-FL on the basis that they have invested significantly in the technology development and safety studies.

FSANZ decided to provide the applicant with a 15 month exclusive use permission for the 2'-FL produced by fermentation and derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*, commencing on the date of gazettal of the approved draft variation.

This means that, during that 15 month period, the permission for this 2'-FL would apply exclusively to this substance under the brand 'Aequival® 2'-FL' in accordance with the Code.

Once the 15 month period ends, the exclusive use permission would revert to a general permission, meaning that the permission would apply to all brands of 2'-FL produced by fermentation and derived from the production strain, in accordance with the Code.

An exclusive use permission in the Code does not, and cannot, prevent approval of second or subsequent applications either within the exclusive use period or during the progression of an application, for the use of the same food or ingredient by other food companies, providing the application process is undertaken.

3.4 The five year review for 2'-FL in Infant Formula Products

FSANZ is committed to reviewing any new evidence on the beneficial role of 2'-FL in the normal growth and development of infants.

At the request of Food Ministers, FSANZ will carry out a five year review (to be completed by March 2026) of the evidence of a substantiated beneficial role of 2'-FL in the normal growth

and development of infants. This process will include consultation with a range of stakeholders including experts, industry and government and will be independently peer reviewed.

FSANZ has started the review by defining the research questions, reviewing existing evidence and seeking out the relevant data needed, including from industry and recently published studies. Details on the review process will be made available on the FSANZ website.

3.5 Labelling

3.5.1 Statement of ingredients

Standard 1.2.4 requires food for sale to be labelled with a statement of ingredients unless exempt. The label on a package of IFP must contain a statement of ingredients. Should manufacturers choose to add the 2'-FL derived from the production strain alone or combined with LNnT to IFP, then this substance must be declared in the statement of ingredients.

Generic ingredient labelling provisions in Section 1.2.4—4 require ingredients to be identified using a name by which they are commonly known, or a name that describes its true nature, or a generic ingredient name if one is specified in Schedule 10 *Generic names of ingredients and conditions for their use*.

Noting the existing prohibited representations in paragraphs 2.9.1—24(1)(ca) and (cb) (refer Section 3.5.3 below), these existing ingredient naming requirements will apply to 2'-FL, enabling industry to have flexibility in how they declare this ingredient (for example, using the scientific name '2'-fucosyllactose').

3.5.2 Mandatory nutrition information

Section 2.9.1—21 regulates the declaration of nutrition information in a nutrition information statement (NIS) on the label of IFP. The NIS is a single statement and may be in the form of a table, as indicated in Section S29—10 *Guidelines for infant formula products*.

Subparagraph 2.9.1—21(1)(a)(iii) requires the average amount of any substance used as a nutritive substance permitted by Standard 2.9.1 to be declared in the NIS. The specific 2'-FL in this application will need to be declared in the NIS when it is voluntarily added to a IFP.

3.5.3 Prohibited representations

Paragraph 2.9.1—24(1)(ca) prohibits the use of the words 'human milk oligosaccharide', 'human milk identical oligosaccharide' or any word or words having the same or similar effect. In addition, paragraph 2.9.1—24(1)(cb) prohibits the use of the abbreviations 'HMO' or 'HiMO' or any abbreviation having the same or similar effect. The words and abbreviations in these provisions cannot be used anywhere on the label of a package of IFP. The 2'-FL derived from the production strain will be subject to these provisions regarding prohibited representations.

3.5.4 Voluntary representations

Subsection 1.2.7—4(b) of Standard 1.2.7 states that a nutrition content or health claim must not be made about an IFP. Paragraph 2.9.1—24(1)(f) of Standard 2.9.1 also prohibits a reference to the presence of a nutrient or substance that may be used as a nutritive

substance, except for a reference in: a statement relating to lactose under subsection 2.9.1—14(6), a statement of ingredients, or in the NIS. These existing prohibitions for nutrition content and health claims for IFPs will apply to the applicant's 2'-FL.

3.5.5 Labelling as 'genetically modified'

As discussed in the safety and risk assessment report (SD1), the applicant's 2'-FL is highly unlikely to contain novel protein or novel DNA due to the purification step used in the production of this oligosaccharide. It is therefore highly unlikely that novel protein or novel DNA will be present in an IFP that contains this 2'-FL as an ingredient. However, where novel protein or novel DNA is present, the requirement to label 2'-FL as 'genetically modified' will apply in accordance with section 1.5.2—4.

3.6 Risk management conclusion

Having considered and weighed all aspects of the assessment against the statutory requirements, including relevant Ministerial Policy Guidelines and current permissions for 2'-FL in the Code, FSANZ approved a draft variation to the Code to permit the voluntary addition of 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* to IFP. The draft variation was approved with amendments to set a new single specification for 2'-FL sourced from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*.

The addition to IFP of 2'-FL produced using *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* will be subject to relevant requirements and conditions in the Code, which include the following:

- It may be added alone or in combination with LNnT up to a maximum level of 2.4 g/L for 2'-FL, as consumed. This applies for the first 15 months, afterwards the permission applies to any 2'-FL produced using *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*.
- The existing prohibition for the use of 2'-FL with GOS and ITF would apply to IFP that contain the 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*.
- The existing prohibition for the use of the words 'human milk identical oligosaccharide' or 'human milk oligosaccharide', and abbreviations 'HMO', 'HiMO' or any word or words or abbreviations having the same or similar effect, would apply to IFP that contain the 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*.
- An exclusive permission to use 2'-FL derived from *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* will apply for a period of 15 months, linked to the applicant's brand name 'Aequival® 2'-FL', commencing on the date of gazettal of the approved draft variation.
- Schedule 3 of the Code will set a specification for this 2'-FL, with which that 2'-FL must comply.
- The permission is subject to the outcome of the five year review which will reassess evidence of a substantiated beneficial role of 2'-FL in the normal growth and development of infants.

The approved draft variation is at Attachment A. The explanatory statement for the variation is at Attachment B. The draft variation on which submissions were sought is at Attachment C.

Risk communication

4.1 Consultation

Consultation is a key part of FSANZ's standards development process.

FSANZ developed and applied a standard communication strategy to this application. Subscribers and interested parties were notified about the public consultation period via the FSANZ Standards Notification Circular. A media release, FSANZ's social media tools and Food Standards News were also used to raise awareness in the community regarding the opportunity for comment.

A public consultation paper called for submissions on FSANZ's assessment and on a draft variation from 6 December 2021 to 31 January 2022. FSANZ received 8 submissions. FSANZ had regard to all submissions received for this application as part of its assessment.

FSANZ acknowledges the time taken by individuals and organisations to make submissions on this application. Every submission was considered by the FSANZ Board. All comments are valued and contribute to the rigour of our assessment.

5 FSANZ Act assessment requirements

5.1 Section 29

When assessing this application and the subsequent development of a food regulatory measure, FSANZ has had regard to the following matters in section 29 of the FSANZ Act:

5.1.1 Consideration of costs and benefits

The Office of Best Practice Regulation (OBPR) granted FSANZ a standing exemption from the requirement to develop a Regulatory Impact Statement (RIS) for permitting genetically modified foods (OBPR correspondence dated 24 November 2010, reference 12065) and for the voluntary addition of nutritive substances to foods (OBPR correspondence dated 16 April 2013, reference 14943).

FSANZ, however, has given consideration to the costs and benefits that may arise from the proposed measure for the purposes of meeting FSANZ Act considerations. The FSANZ Act requires FSANZ to have regard to whether costs that would arise from the proposed measure outweigh the direct and indirect benefits to the community, government or industry that would arise from the proposed measure (paragraph 29(2)(a)).

The purpose of this consideration is to determine if the community, government, and industry as a whole is likely to benefit, on balance, from a move from the status quo (where status quo is rejecting the application). This analysis considers permitting the genetically modified production strain, for the production of 2'-FL by fermentation. FSANZ is of the view that no other realistic food regulatory measures exist, however information received during public consultation may result in FSANZ arriving at a different outcome.

The consideration of the costs and benefits in this section is not intended to be an exhaustive, quantitative economic analysis of the proposed measures. In fact, most of the effects that were considered cannot easily be assigned a dollar value. Rather, the

assessment seeks to highlight the likely positives and negatives of permitting the new production strain, for the production of 2'-FL, a beneficial human milk oligosaccharide, for addition to IFP.

Due to the voluntary nature of the permission, industry will produce 2'-FL derived from the production strain where they believe a net benefit exists for them. 2'-FL is a nutritive substance and it is already available to industry from a different source. It may benefit industry to have this additional way of producing 2'-FL for addition to IFP, especially where it saves on costs. This would increase competition in the manufacturing processes. A potentially greater supply and lower cost of 2'-FL from this proposed permission could also help IFP exporters that want to use 2'-FL in their products to compete internationally. Costs of producing and purchasing IFP might then reduce and availability might increase, potentially benefitting both industry and consumers.

Industry may pass some of the cost savings to consumers where it is cheaper to derive 2'-FL from the production strain.

Permitting this additional production strain may result in a small but likely inconsequential cost to government in terms of compliance monitoring for an additional micro-organism for the production of 2'-FL.

This application will align Australian and New Zealand with the US and the EU, which both permit the addition of 2'-FL derived from the applicant's production strain.

Conclusions from cost benefit considerations

FSANZ's assessment is that the direct and indirect benefits that would arise from permitting genetically modified *E. coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*, as the microbial source for the production of 2'-FL as a nutritive food substance most likely outweigh the associated costs.

5.1.2 Other measures

There are no other measures (whether available to FSANZ or not) that would be more cost-effective than a food regulatory measure developed or varied as a result of the application.

5.1.2.1 Any relevant New Zealand standards

Relevant standards apply in both Australia and New Zealand. There are no relevant New Zealand only Standards.

5.1.2.2 Any other relevant matters

Other relevant matters are considered below.

5.2 Subsection 18(1)

FSANZ has also considered the three objectives in subsection 18(1) of the FSANZ Act during the assessment.

5.2.1 Protection of public health and safety

FSANZ completed a safety and risk assessment (SD1) which is summarised in section 2 of this report. Previous assessments found no safety concerns associated with the addition of 2'-FL to IFP. New information provided did not change this conclusion.

5.2.2 The provision of adequate information relating to food to enable consumers to make informed choices

Current labelling requirements discussed in section 3.5 will apply to the 2'-FL derived from the production strain when added to IFP and will provide information to enable consumers to make an informed choice.

5.2.3 The prevention of misleading or deceptive conduct

Current labelling requirements, including prohibited representations described in section 3.5.3, which aim to prevent misleading or deceptive conduct, will apply to the 2'-FL derived from the production strain when added to IFP.

5.3 Subsection 18(2) considerations

FSANZ has also had regard to:

- **the need for standards to be based on risk analysis using the best available scientific evidence**

FSANZ used the risk analysis framework and considered the best available evidence to reach its conclusions on the safety, technical and beneficial health outcomes of the 2'-FL derived from the production strain.

- **the promotion of consistency between domestic and international food standards**

FSANZ considered the promotion of consistency between domestic and international food standards and the desirability of an efficient and internationally competitive food industry. 2'-FL is permitted in IFP equivalent products; and several other foods across various countries around the world. Permissions are for use alone or in combination with LNnT; including at a range of levels and with country-specific labelling requirements.

FSANZ considers both 2'-FL products from host organism *E. coli* K-12 (i.e. from gene-donor *Bacteroides vulgatus*; or *Helicobacter pylori*) can meet the single specification set out in the approved draft variation. This specification will provide greater clarity in the Code and harmonises (to an extent that is appropriate in having regard to the FSANZ Act) with the EU specification (2019).

- **the desirability of an efficient and internationally competitive food industry**

The proposed permission would support an internationally competitive food industry in relation to the addition of 2'-FL to IFP, and is consistent with existing permissions in the Code for 2'-FL.

- **the promotion of fair trading in food**

No issues were identified for this application relevant to this objective.

- **any written policy guidelines formulated by the Food Ministers' Meeting⁷**

As part of A1233, FSANZ has had regard to both high order and specific policy principles in the following Ministerial Policy Guidelines for the Regulation of Infant Formula Products.

- Regulation of Infant Formula Products
- Intent of Part 2.9 of the Food Standards Code – Special Purpose Foods

FSANZ considers that through the proposed permission for 2'-FL to be added to Infant Formula Products, policy guidelines have been met.

6 References

ESFA 2015 Safety of 2'-O-fucosyllactose as a novel food ingredient pursuant to Regulation (EC) No 258/97 *EFSA Journal* 13(7) 4184.

European Union (2019) Commission Implementing Regulation (EU) 2019/388 of 11 March 2019 authorising the change of the specifications of the novel food 2'-fucosyllactose produced with *Escherichia coli* K-12 under Regulation (EU) 2015/2283 of the European Parliament and of the Council and amending Commission Implementing Regulation (EU) 2017/2470

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0388&rid=8>

FSANZ (2008) Proposal P306, Final Assessment Report, Addition of Inulin/FOS & GOS to Food. Food Standards Australia New Zealand.

FSANZ (2013) Application A1055, Approval Report, Short Chain Fructo-oligosaccharides. Food Standards Australia New Zealand.

⁷ Formerly known as the Australia and New Zealand Ministerial Forum on Food Regulation

Attachments

- A. Approved draft variation to the Australia New Zealand Food Standards Code
- B. Explanatory Statement
- C. Draft variation to the Australia New Zealand Food Standards Code (call for submissions)

Attachment A – Approved draft variation to the Australia New Zealand Food Standards Code



Food Standards (Application A1233 – 2'-FL from a new GM source for infant formula) Variation

The Board of Food Standards Australia New Zealand gives notice of the making of this variation under section 92 of the *Food Standards Australia New Zealand Act 1991*. The variation commences on the date specified in clause 3 of this variation.

Dated [To be completed by the Delegate]

[Delegate's name and position]

Delegate of the Board of Food Standards Australia New Zealand

Note:

This variation will be published in the Commonwealth of Australia Gazette No. FSC **XX on XX Month 20XX**. This means that this date is the gazettal date for the purposes of clause 3 of the variation.

1 Name

This instrument is the *Food Standards (Application A1233 – 2'-FL from new GM source for infant formula) Variation*.

2 Variation to Standards in the *Australia New Zealand Food Standards Code*

The Schedule varies Standards in the *Australia New Zealand Food Standards Code*.

3 Commencement

The variation commences on the date of gazettal.

Schedule

[1] Schedule 3—Identity and Purity

[1.1] Subsection S3—2(2) (table item dealing with the substance 2'-fucosyllactose sourced from *Escherichia coli* K-12)

Repeal the item, substitute:

2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus* section S3—40

[1.2] Section S3—40

Repeal the section, substitute:

S3—40 Specification for 2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*

For 2'-fucosyllactose (2'-FL) sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*, the specifications are the following:

- (a) chemical name— α -L-fucopyranosyl-(1→2)- β -D-galactopyranosyl-(1→4)-D-glucopyranose;
- (b) chemical formula— $C_{18}H_{32}O_{15}$;
- (c) molecular weight—488.44 g/mol;
- (d) CAS number—41263-94-9;
- (e) description— white to off-white powder
- (f) 2'-FL—not less than 83%;
- (g) D-lactose—not more than 10.0%;
- (h) L-fucose—not more than 2.0%;
- (i) difucosyl-D-lactose—not more than 5.0 %;
- (j) 2'-fucosyl-D-lactulose—not more than 1.5 %;
- (k) sum of saccharides (2'-FL, D-lactose, L-fucose, difucosyl-D-lactose, 2'-fucosyl-D-lactulose)—not less than 90%;
- (l) pH (20°C, 5% solution)—3.0-7.5;
- (m) water—not more than 9.0%;
- (n) ash, sulphated—not more than 2.0%;
- (o) acetic acid—not more than 1.0%;
- (p) residual proteins—not more than 0.01%;
- (q) microbiological:
 - (i) aerobic mesophilic bacteria total count—not more than 3,000 cfu/g;
 - (ii) yeasts—not more than 100 cfu/g;
 - (iii) moulds—not more than 100 cfu/g;
 - (iv) endotoxins—not more than 10 EU/mg.

[2] **Schedule 26—Food produced using gene technology**

[2.1] **Subsection S26—3(7) (table item 1)**

Repeal the item, substitute:

1 2'-fucosyllactose

(a) *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Helicobacter pylori*

1. May only be added to infant formula products.
2. During the exclusive use period, may only be sold under the brand GlyCare.
3. For the purposes of condition 2 above, **exclusive use period** means the period commencing on the date of gazettal of the *Food Standards (Application A1155 – 2'-FL and LNnT in infant formula and other products) Variation* and ending 15 months after that date.

(b) *Escherichia coli* BL21 containing the gene for alpha-1,2-fucosyltransferase from *Escherichia coli* O126

1. May only be added to infant formula products.
2. During the exclusive use period, may only be sold under the brand CHR. HANSEN™ 2'-FL.
3. For the purposes of condition 2 above, **exclusive use period** means the period commencing on the date of gazettal of the *Food Standards (Application A1190 – 2'-FL in infant formula and other products) Variation* and ending 15 months after that date.

(c) *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*

1. May only be added to infant formula products.
2. During the exclusive use period, may only be sold under the brand Aequival® 2'FL.
3. For the purposes of condition 2 above, **exclusive use period** means the period commencing on the date of gazettal of the *Food Standards (Application A1233 – 2'-FL from new GM source for infant formula) Variation* and ending 15 months after that date.

Attachment B – Explanatory Statement

1. Authority

Section 13 of the *Food Standards Australia New Zealand Act 1991* (the FSANZ Act) provides that the functions of Food Standards Australia New Zealand (the Authority) include the development of standards and variations of standards for inclusion in the *Australia New Zealand Food Standards Code* (the Code).

Division 1 of Part 3 of the FSANZ Act specifies that the Authority may accept applications for the development or variation of food regulatory measures, including standards. This Division also stipulates the procedure for considering an application for the development or variation of food regulatory measures.

The Authority accepted A1233 which sought to permit the voluntary addition of 2'-fucosyllactose (2'-FL) from a new microbial source, as a nutritive substance, to infant formula products. The Authority considered the application in accordance with Division 1 of Part 3 and has approved a draft variation.

Following consideration by the Food Ministers' Meeting, section 92 of the FSANZ Act stipulates that the Authority must publish a notice about the standard or draft variation of a standard.

2. Variation is a legislative instrument

The approved draft variation is a legislative instrument for the purposes of the *Legislation Act 2003* (see section 94 of the FSANZ Act) and is publicly available on the Federal Register of Legislation (www.legislation.gov.au).

This instrument is not subject to the disallowance or sunset provisions of the *Legislation Act 2003*. Subsections 44(1) and 54(1) of that Act provide that a legislative instrument is not disallowable or subject to sunset if the enabling legislation for the instrument (in this case, the FSANZ Act): (a) facilitates the establishment or operation of an intergovernmental scheme involving the Commonwealth and one or more States; and (b) authorises the instrument to be made for the purposes of the scheme. Regulation 11 of the *Legislation (Exemptions and other Matters) Regulation 2015* also exempts from sunset legislative instruments a primary purpose of which is to give effect to an international obligation of Australia.

The FSANZ Act gives effect to an intergovernmental agreement (the Food Regulation Agreement) and facilitates the establishment or operation of an intergovernmental scheme (national uniform food regulation). That Act also gives effect to Australia's obligations under an international agreement between Australia and New Zealand. For these purposes, the Act establishes the Authority to develop food standards for consideration and endorsement by the Food Ministers Meeting (FMM). The FMM is established under the Food Regulation Agreement and the international agreement between Australia and New Zealand, and consists of New Zealand, Commonwealth and State/Territory members. If endorsed by the FMM, the food standards on gazettal and registration are incorporated into and become part of Commonwealth, State and Territory and New Zealand food laws. These standards or instruments are then administered, applied and enforced by these jurisdictions' regulators as part of those food laws.

3. Purpose

The purpose of the approved draft variation is to :

- amend Schedule 26 of the Code to permit the addition of 2'-FL derived from a new microbial source in infant formula products subject to certain conditions, including an exclusive use period of 15 months for the applicant's brand of 2'-FL; and
- amend Schedule 3 of the Code to set a new specification for 2'-FL sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*.

4. Documents incorporated by reference

The approved draft variation does not incorporate any documents by reference.

However, the approved draft variation will vary Schedule 3 of the Code which does incorporate documents by reference. Section 1.1.1—15 of the Code requires certain substances (such as substances used as nutritive substances) to comply with any relevant identity and purity specifications listed in Schedule 3.

Schedule 3 incorporates documents by reference to set specifications for various substances in the circumstances specified in that Schedule. The documents incorporated include: the Joint FAO/WHO Expert Committee on Food Additives (JECFA) Compendium of Food Additive Specifications (FAO/WHO 2019); the United States Pharmacopeial Convention (2020) Food Chemicals Codex (12th edition); and the Commission Regulation (EU) No 231/2012.

5. Consultation

In accordance with the procedure in Division 1 of Part 3 of the FSANZ Act, the Authority's consideration of application A1233 included one round of public consultation following an assessment and the preparation of a draft variation and associated report. Submissions were called for on 6 December 2021 for an eight-week consultation period.

A Regulation Impact Statement (RIS) was not required because the Office of Best Practice Regulation (OBPR) granted the Authority a standing exemption, permitting the voluntary use of genetically modified food (OBPR correspondence dated 24 November 2010, reference 12065), and the voluntary addition of nutritive substances to foods (OBPR correspondence dated 16 April 2013, reference 14943).

6. Statement of compatibility with human rights

This instrument is exempt from the requirements for a statement of compatibility with human rights as it is a non-disallowable instrument under section 44 of the *Legislation Act 2003*.

7. Variation

The amendments in the Schedule take effect in numerical order i.e. according to item and sub-item numbers.

Item [1] of the Schedule varies Schedule 3 of the Code.

Schedule 3 contains specifications for the purposes of section 1.1.1—15 of the Code. Section 1.1.1—15 requires certain substances, e.g. substances used as nutritive substances,

to comply with any relevant identity and purity specifications listed in Schedule 3. The specifications listed in Schedule 3 include those set out in provisions which are listed in the table to subsection S3—2(2) (see paragraph S3—2(1)(a)).

Item [1.1] amends the table to subsection S3—2(2). It amends the entry in that table for section S3—40 by replacing the words ‘2'-fucosyllactose sourced from *Escherichia coli* K-12’ with ‘2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*'. This amendment is a consequence of the amendment made by item [1.2] below.

Item [1.2] repeals and replaces section S3—40 with a new section S3—40. The new section lists a specification for 2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from either *Helicobacter pylori* or *Bacteroides vulgatus*'.

Item [2] amends Schedule 26 of the Code.

Schedule 26 relates to food produced using gene technology. 2'-FL sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* is a food produced using gene technology (as defined in subsection 1.1.2—2(3) of the Code) because it is derived from an organism modified using gene technology.

Paragraph 1.5.2—3(a) permits a food for sale to consist of, or have as an ingredient, a food produced using gene technology if the food produced using gene technology (other than a processing aid or food additive) is listed in Schedule 26 and complies with any corresponding conditions in that Schedule.

The table to subsection S26—3(7) lists food produced using gene technology of microbial origin. Item [2] will amend item [1] of that table to provide a permission for the use of 2'-FL sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*.

In order to add the new permission to the table, item [2] will repeal and then restate the entire entry in the table for 2'-FL but with the new source permission included in the restated entry as sub-item (c) in column 2, and its associated conditions of use set out in column 3. These conditions of use are as follows:

1. the substance may only be added to infant formula;
2. during the exclusive use period, the substance may only be sold under the brand Aequival® 2'FL; and
3. for the purposes of condition 2, exclusive use period means the period commencing on the date of gazettal of the *Food Standards (Application A1233 – 2'-FL from new GM source for infant formula) Variation* and ending 15 months after that date.

Condition 2 will mean that 2'-FL sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* may only be sold under the brand 'Aequival® 2'FL' during the exclusive use period. 'Exclusive use period' will be defined in condition 3 as the period commencing upon gazettal of the draft variation and ending 15 months after that date

Once this period ends, the permission will revert to a general permission, meaning that the permission will then permit the sale of 2'-FL sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* to be sold under any brand.

The amendments made by **item [2]** do not make any substantive change to *existing* permissions and to other requirements in the Code relating to food produced using gene technology.

Attachment C – Draft variation to the *Australia New Zealand Food Standards Code* (call for submissions)



Food Standards (Application A1233 – 2'FL from a new GM source for infant formula) Variation

The Board of Food Standards Australia New Zealand gives notice of the making of this variation under section 92 of the *Food Standards Australia New Zealand Act 1991*. The variation commences on the date specified in clause 3 of this variation.

Dated [To be completed by the Delegate]

[Delegate's name and position]

Delegate of the Board of Food Standards Australia New Zealand

Note:

This variation will be published in the Commonwealth of Australia Gazette No. FSC XX on XX Month 20XX. This means that this date is the gazettal date for the purposes of clause 3 of the variation.

1 Name

This instrument is the *Food Standards (Application A1233 – 2'-FL from new GM source for infant formula) Variation*.

2 Variation to Standards in the *Australia New Zealand Food Standards Code*

The Schedule varies Standards in the *Australia New Zealand Food Standards Code*.

3 Commencement

The variation commences on the date of gazettal.

Schedule

Schedule 3—Identity and Purity

[1] Subsection S3—2(2) (table item dealing with the substance 2'-fucosyllactose sourced from *Escherichia coli* K-12)

Repeal the item, substitute:

2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Helicobacter pylori* section S3—40

[2] Subsection S3—2(2) (table)

Insert:

2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus* section S3—46

[3] Section S3—40 (heading)

Repeal the heading, substitute:

S3—40 Specification for 2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Helicobacter pylori*

[4] Section S3—40 (the phrase “For 2'-fucosyllactose (2'-FL) sourced from *Escherichia coli* K-12”)

Omit the phrase, substitute:

“For 2'-fucosyllactose (2'-FL) sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Helicobacter pylori*”

[5] After section S3—45

Insert:

S3—46 Specification for 2'-fucosyllactose sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*

For 2'-fucosyllactose (2'-FL) sourced from *Escherichia coli* K-12 containing the gene for alpha-1,2-fucosyltransferase from *Bacteroides vulgatus*, the specifications are the following:

- chemical name—alpha-L-fucopyranosyl-(1→2)-beta-D-galactopyranosyl-(1→4)-D-glucopyranose;
- chemical formula—C₁₈H₃₂O₁₅;
- molecular weight—488.44 g/mol;
- CAS number—41263-94-9;
- description— white to off-white powder

- (f) 2'-FL—not less than 83%;
- (g) D-lactose—not more than 10.0%;
- (h) L-fucose—not more than 2.0%;
- (i) difucosyl-D-lactose—not more than 5.0 %;
- (j) 2'-fucosyl-D-lactulose—not more than 1.5 %;
- (k) sum of saccharides (2'-FL, D-lactose, L-fucose, difucosyl-D-lactose, 2'-fucosyl-D-lactulose)—not less than 90%;
- (l) pH (20°C, 5% solution)—3.0-7.5;
- (m) water—not more than 9.0%;
- (n) ash, sulphated—not more than 2.0%;
- (o) acetic acid—not more than 1.0%;
- (p) residual proteins—not more than 0.01%;
- (q) microbiological:
 - (v) aerobic mesophilic bacteria total count—not more than 3,000 cfu/g;
 - (vi) yeasts—not more than 100 cfu/g;
 - (vii) moulds—not more than 100 cfu/g;
 - (viii) endotoxins—not more than 10 EU/mg.

Schedule 26—Food produced using gene technology

[6] Subsection S26—3(7) (table item 1)

Repeal the item, substitute:

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|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 2'-fucosyllactose</p> | <p>(a) <i>Escherichia coli</i> K-12 containing the gene for alpha-1,2-fucosyltransferase from <i>Helicobacter pylori</i></p> <p>(b) <i>Escherichia coli</i> BL21 containing the gene for alpha-1,2-fucosyltransferase from <i>Escherichia coli</i> O126</p> | <ol style="list-style-type: none"> 1. May only be added to infant formula products. 2. During the exclusive use period, may only be sold under the brand GlyCare. 3. For the purposes of condition 2 above, exclusive use period means the period commencing on the date of gazettal of the <i>Food Standards (Application A1155 – 2'-FL and LNnT in infant formula and other products) Variation</i> and ending 15 months after that date. 4. May only be added to infant formula products. 5. During the exclusive use period, may only be sold under the brand CHR. HANSEN™ 2'-FL. 6. For the purposes of condition 2 above, exclusive use period means the period commencing on the date of gazettal of the <i>Food Standards (Application A1190 – 2'-FL in infant formula and other products) Variation</i> and ending 15 months after that date. |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

(c) *Escherichia coli* K-12
containing the gene alpha-
1,2-fucosyltransferase from
Bacteroides vulgatus

4. May only be added to infant formula products.
5. During the exclusive use period, may only be sold under the brand Aequival® 2'FL.
6. For the purposes of condition 2 above, **exclusive use period** means the period commencing on the date of gazettal of the *Food Standards (Application A1233 – 2'-FL from new GM source for infant formula) Variation* and ending 15 months after that date.