COMMITTEE PAPER FOR DISCUSSION ACNFP/128/02
ADVISORY COMMITTEE FOR NOVEL FOODS AND PROCESSES

DHA RICH ALGAL OIL FROM SCHIZOCHYTRIUM SPECIES T18

Issue

The Committee reviewed this application at the meetings in November 2016 and February 2017, and requested further information on which to base their assessment. Members are invited to consider the response from the applicant and whether it recommends authorisation of the extension of use of the product.

Background

1. The substantial equivalence of the Mara Renewables DHA oil also known as T18 was assessed and authorised by the Irish competent authority for the existing authorised uses of this form of algal oil (DHA –S).

2. An application has now been submitted to the UK by the company, for an extension of use authorisation of its DHA rich algal oil in the EU. The applicant proposes to incorporate the DHA rich oil into additional product categories namely fruit and vegetable purees, infant formula, other foods for special groups and baby foods.

3. At the previous two meetings the Committee requested further information in a number of areas

    a) Specifications and the nutritional information on the novel food

    b) Effect of the production process applied to the novel food and

    c) Toxicology

4. To assist in the Committee's consideration a summary of the issues considered to date and the applicant's response are provided in **Annex A**. A letter outlining the request for further information from the discussion at the February meeting is provided in **Annex B**. The applicant has now provided a response to the Committee's questions **Annex C**. A draft opinion has been prepared for consideration if the Committee considers it is appropriate in **Annex D**. Particular aspects where the Secretariat would welcome further input from the Committee are highlighted in the text.

a) Specification of the novel food

5. The Committee at the previous meeting had considered the information supplied by the applicant comparing the composition of the novel ingredient to

other authorised DHA rich oils. It was suggested that this should be reformatted to show the range of three analyses rather than mean values and that the basis of the percentage (weight or volume) should be clear. Members also sought clarification on how the sterol content analyses relate to the free fatty acid content as some of the results for the values reported appeared to be inconsistent with each other.

6. In their response the applicant has provided composition information, based on multiple batches, compared to the other authorised DHA rich oils. This includes the DHA–S to which the product has gained a substantial equivalence authorisation. They have also made comparisons to DHA-B which is recognised as a separate form of DHA rich oil from a different strain of microalgae and which is currently the only source of microalgae derived DHA oil, to be authorised for use in foods for infants and young children.

7. They explain that there was an error in the previous table and this had led to the inconsistencies between the fatty acid content and the sterol content noted by the Committee previously. The revised version in their response in **Annex C** has sought to address this error.

b) Effect of the production process applied to the novel food

8. The Committee had noted the information provided previously on the potential for algal toxins to be produced by the Schizochytrium sp. producing the novel food. However, for clarification at the February meeting information was requested on the measures used to control for contamination with other microorganisms in particular cyanobacteria during production.

9. The applicant’s response explains that they use a HACCP based system to minimise contamination of the fermentation vessels with other forms of microorganism. Quality control checks are employed at each stage of the production process with conditions set to minimise the risk with foreign materials.

10. The vessels pipelines, fermentation media are subject to a highly controlled sterilisation procedure before the microorganisms are introduced to the fermenter. The fermentation is undertaken in a closed system, under axenic conditions to ensure that the microalgae species of interest is the only species present post inoculation. The fermentation vessels are maintained under positive pressure to prevent contamination. These processes were suggested by the applicant to prevent contamination with cyanobacteria. They further commented that as the fermentation is undertaken in the dark it is unlikely to be an environment where cyanobacteria would grow.

11. They suggest that the effectiveness of the controls against their microbiological specification has been demonstrated with the data for six

batches provided in their application. The applicant explained in their dossier that refined algal oil is routinely monitored to ensure that it consistently meets the microbiological criteria for Salmonella, Escherichia coli, coagulase positive Staphylococci, yeast, mould and total coliforms set out in the specification.

c) Toxicological information on the novel food

12. Previously the Committee has requested further information on the margin of safety between the NOAEL and the anticipated intake of the novel ingredient as a result of extending the food categories. Following discussion at the last meeting further clarification on the range and the margin of safety for the groups exposed to high intakes of the novel food.

13. In response the applicant explains that for this novel ingredient toxicological testing suggested a NOAEL at the highest dose tested, 5% of the diet, in a 90 day study of 3305 and 3679 mg/kg bw/day in males and females respectively. Using 3305 mg/kg bw/day as the NOAEL information has been provided on the margins of exposure for different consumer groups on the basis of population average intakes and high level consumers using the European standard food consumption database which includes data on consumption patterns from across Europe. The assessment has been prepared to consider the intake of all existing and proposed food categories for this form of DHA rich oil. Further detail on the intake assessment can be found in Appendix 4 of the original dossier.

14. The applicant's response includes calculation of the margin of exposure (MoE) based on population average intake and total high level intake[1] assessments. Looking at the high level consumer's infants and toddlers had the highest intakes of the novel ingredient with MOE of 17 and 33 respectively. The applicant suggests that the intake assessments are likely to be overly conservative as they assume that consumers of the product will always eat a product containing the novel ingredient at the highest level of addition. The scenario for consumers of infant formula in particular is explored in the response along with the assumptions made in coming to the assessment.

COMMITTEE ACTION REQUIRED

a) The Committee is asked whether the response from the applicant is sufficient to address the questions raised in November 2016 and February 2017.

[1] The high level intake for each population group is estimated by adding the highest 95th percentile value from any group to the sum of the population averages for all other foods.

b) If not, the Committee is asked to indicate what feedback should be given to the applicant.

Secretariat
April 2017

Annexes attached:

Annex A – Summary of issues raised in the assessment to date and the applicant's responses.

Annex B – Letter providing feedback to the applicant from the February meeting of the ACNFP.

Annex C - The applicant's response to the request for further information.

Annex D – Draft opinion for the Committees input.

Annex A - Summary of committee's consideration to date:

Issue Raised	Applicants response	Committee's response from the minutes of the discussion
Specification of the novel food		
• The Committee were keen to understand how the novel ingredient's composition compares to other authorised DHA rich oils in order to understand if it would be nutritionally disadvantageous. • The Committee also requested information on the anti-oxidants listed as ingredients to the novel product.	• In their response the applicant has provided composition information, based on multiple batches, compared to the other authorised DHA rich oils. This includes the DHA -S to which the product has gained a substantial equivalence authorisation. This is subject to further discussion in the paper above. • Information has been provided on the antioxidants that are commonly used as ingredients in the oil.	Discussion ongoing
Production process and level of undesirable substance		
• The Committee had sought a further explanation from the applicant on the choice of algal toxins for analysis in their dossier. Of interest was whether the selection was a function of the production process and whether regular testing once in full production was planned to manage any risk of algal toxin production. • Questions were also raised on how it would be ensured that the system would not be contaminated with other microorganisms.	The applicant's response comments that algal toxins have not been identified in the *Thraustochytriaceae* family to which *Schizochytrium sp* belong. However, further testing of microalgae toxins from the wider kingdom of microalgae were undertaken to demonstrate that these were not produced in this production system. The applicant therefore considers that it is unnecessary to undertake regular testing for the presence of microalgal toxins.	The information provided on the algal toxins produced during the production process was considered and it was suggested that this was not a risk Consideration ongoing
Nutritional information on the novel food		
The Committee requested a comparison of the novel ingredient's composition compared to that of oils currently used in infant formulas as a source of DHA.	In their response the applicant has compared the fatty acid composition of the novel ingredient to both the authorised DHA rich oil that can be used in infant formulas (DHA-B) and Tuna oil an alternative source of DHA in this food category. Further information on this is provided in the paper above.	Consideration ongoing in light of further data on the composition.
Toxicology		

Margin of safety assessment The applicant was asked to provide an assessment of the Margin of Safety between the intakes calculated and the NOAEL's seen in the toxicological studies	In response they have highlighted that the safety of microalgae oils has been demonstrated by a number of studies and that their novel ingredient is similar in composition to those already marketed. For this novel ingredient toxicological testing suggested a NOAEL at the highest dose tested, 5% of the diet, in a 90 day study of 3305 and 3679 mg/kg bw/day in males and females respectively. The consumption levels seen in the intake assessment vary between population groups between 8-60mg/kg bw/day which is 55-413 times lower than the NOAEL. The applicant therefore argues that the use of the oil is safe.	Consideration ongoing
Long term exposure Members noted that the longest toxicological study undertaken on the novel food has been 3 months in duration. It was recognised that infants, could have life-long exposure to the novel ingredient from the range of permitted uses. The applicant was asked to comment on the safety of long term use of the novel ingredient.	The applicant argues that DHA rich oils have been used safely in infant formula since the 1990's and the safety of this type of oil is well established. The same uses as currently sought were evaluated for other DHA rich oils and felt to be sufficient to support safety. The applicant has commented that for the highest intakes to be maintained over the longer term, infants would need to consume the ingredient at the maximum level of addition, which it is argued is overly conservative.	Conclusion not made but no further questions have been raised on this topic.
Level of silicon in the novel product It was noted that the levels of silicon in the mineral analysis of the novel ingredient were higher than the other minerals in the oil. The applicant was asked to comment on the silicon levels that the end user would experience in the final product and to compare this to the level of silicon from other dietary sources to understand if this would be of health concern.	The level of silicon in the novel ingredient was reported to be 51-110mg/kg. The applicant has calculated potential exposure for infants based on consuming 400mg DHA oil per day the daily exposure to silicon would be approximately 0.011mg/day, 15,636-18,727 times lower than seen in the case study described in Nishizono et al 2004 where there were detrimental health effects from high levels of silicon in the diet. On this basis the applicant does not consider that the level of silicon is a health concern.	The Committee accepted the information from the applicant that the level of silicon in the product as consumed was unlikely to be a safety concern.