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**DRAFT OPINION ON SUBSTANTIAL EQUIVALENCE OF PHYTOSTEROLS
CONSIDERED UNDER ARTICLE 5 OF THE NOVEL FOODS REGULATION**

Applicant Naturis (ACI Group Ltd.)
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United Kingdom

Responsible person Ms Lorraine Bailey

INTRODUCTION

1. A request was submitted by Naturis to the UK Competent Authority, in November 2007, for an opinion on the equivalence of their phytosterols with the phytosterols marketed by Archer Daniels Midland (ADM).
2. ADM gained authorisation for the use of its phytosterols through Commission Decision 2004/333/EC. Naturis are seeking a view on equivalence for the use of their phytosterol ingredient in the same food categories specified in ADM's authorisation, namely: yellow fat spreads, salad dressings, milk type products, fermented milk type products, soya drinks and cheese type products.
3. According to Article 3(4) of (EC) 258/97, the notification procedure applies to "foods or food ingredients ...which on the basis of the scientific evidence available and generally recognised or on the basis of an opinion delivered by one of the competent bodies ... are substantially equivalent to existing foods or food ingredients as regards their:
 - composition,
 - nutritional value,
 - metabolism,
 - intended use and
 - level of undesirable substances contained therein."

EVALUATION

(a) Composition

4. Naturis sterols are isolated from non-GM soyabean oil and are marketed as a dry, white, free-flowing powder.
5. The applicant provided a detailed description of the production process used by the US manufacturer of the sterols at the request of the Committee. The applicant

1 states that its manufacturing process is very close to the one used by ADM, which
 2 is described in the Scientific Committee on Food's Opinion on ADM's application¹.
 3 It is noted that the solvent used by the applicant is hexane not heptane which is
 4 described by ADM.

- 5 6. The applicant provides specifications for its phytosterols (Table 1). The applicant
 6 notes that ADM obtain their sterols from by-products of traditional vegetable oil
 7 refining. The starting material described by ADM is "commonly a blend of crude
 8 edible oils, consisting largely of soya bean oil and lesser amounts of corn,
 9 rapeseed and palm oil". The applicant states that their phytosterols are obtained
 10 from soyabeans of natural (i.e. non-GM) origin and the compositional
 11 requirements for their products are strict. They therefore consider that the source
 12 material used for their product is comprised within that described by ADM.
- 13 7. The applicant provides certificates of analysis for four batches of its soyabean oil
 14 derived phytosterol in its application (summarised in Table 1 below). These data
 15 show that the composition of the Naturis product is consistent with EU
 16 requirements and that the final product complies with the specification laid down
 17 in Commission Decision 2004/333/EC.

18 **Table 1**

Composition (%)	Commission Decision 2004/333/EC (ADM)	Naturis product (4 batches)
Beta-sitosterol	<80%	55.2-55.7 %
Beta-sitostanol	<15%	3.69- 3.72%
Campesterol	<40%	27.3-27.8 %
Campestanol	<5%	1.3 -1.4 %
Stigmasterol	<30%	3.4-3.6 %
Brassicasterol	<3%	0.0%
Other sterols/stanols	<3%	2.9- 3.0%
Total Sterols	(see note)	93.9-95.1%

19 Note: The Commission Decision does not impose a limit on the total content of sterols derived
 20 from edible vegetable oils. The SCF Opinion mentions that ADM's product has a minimum
 21 sterol content of 90%.

- 22 8. In further information requested by the Committee, the applicant states that
 23 analysis using common US protocols shows a total phytosterol content above
 24 95%. The remaining 5% is composed of minor sterols (cholesterol, cholestanol,
 25 24 methyl cholesterol, D7, clerosterol D7, 25 stigmastadienol, D7 stigmasterol, D5
 26 avenasterol etc), tocopherols, waxes, steradienes and squalenes. The applicant
 27 also notes that when the preparation is analysed using the protocol common in
 28 the EC the reported phytosterol content may exceed 99%.

29
 30 **Discussion:** *The Committee noted that the composition of Naturis phytosterols*
 31 *complied with the specification of phytosterols in Commission Decision 2004/333/EC.*
 32 *Members noted that sterol profiles can vary depending on the variability of the*
 33 *sourcing and seasonal variation of the source oils. Given that the applicant's*

¹ Opinion of the Scientific Committee on Food on an application from ADM for approval of plant sterol-enriched foods (expressed on 4 April 2003), available from http://ec.europa.eu/food/fs/sc/scf/reports_en.html

1 *ingredient is manufactured using the same production process as the ADM product,*
2 *and it is derived from the species of vegetable oil that is the main source of the ADM*
3 *product, the Committee accepted that the unquantified minor components present in*
4 *the applicant's ingredient are also likely to be present in ADM's phytosterol*
5 *preparation.*

6 **(b), (c) Nutritional value and metabolism**

7 9. The composition of the phytosterols manufactured by Naturis and ADM are very
8 similar, as might be expected from the similarities in the source materials and the
9 production processes. There is no information to suggest that the nutritional
10 value of the two preparations or their metabolism will differ.

11 **(d) Intended use**

12 10. Naturis intends that its phytosterols will be used in milk type products, salad
13 dressings (including mayonnaise), fermented milk type products (yoghurts, soya
14 drinks and cheese products), spicy sauces and yellow fat spreads. These
15 products are the same as those authorised to be placed on the market when
16 containing ADM phytosterols. The Naturis ingredient is intended to be added to
17 the same products as those already approved in Commission Decision
18 2004/333/EC.

19 **Discussion:** *The Committee was content that the applicant's product is to be*
20 *consumed at the same level and in the same range of products as the existing*
21 *product.*

22 **(e) Levels of undesirable substances**

23 11. GMP is employed in the manufacturing process described by Naturis. The
24 specification and product data sheet include limits on lead (max. 1 mg/kg) and
25 ash content (max. 0.1%) although no analytical data have been provided to
26 demonstrate that the product complies with these limits. The applicant has
27 confirmed that all batches will be tested for ash content and heavy metals. Based
28 upon HACCP analysis, there is a low risk of microbial contamination and 10% of
29 batches will be tested for aerobic organisms and specified pathogens.

30 **Discussion:** *The Committee noted that the levels of undesirable substances in this*
31 *product would be monitored to ensure that they did not exceed acceptable limits.*
32 *Members advised that sufficient monitoring should take place to ensure that the*
33 *level of hexane residues does not exceed the maximum limit of 1mg/kg set in EU*
34 *Directive 88/344/EEC where hexane is authorised for use as an extraction solvent*
35 *in the fractionation of fats and oils.*

36 **Additional information**

37 12. **Labelling** Naturis will advise its customers that all products containing its
38 phytosterols must be labelled in accordance with the requirements set in
39 Commission Regulation (EC) No. 608/2004².

² Commission Regulation (EC) No 608/2004 of 31 March 2004 concerning the labelling of foods and food ingredients with added phytosterols, phytosterol esters, phytostanols and/or phytostanol esters.

1 **13. Safety/Risk assessment** The applicant states that Naturis sterols require low
2 dosage to provide efficacy (0.8 g per day) which is well within daily safety limits
3 established or recommended by regulatory agencies in Europe and the US. The
4 applicant also states that there are many published safety studies on plant
5 phytosterols demonstrating their low order of toxicity. The projected consumer
6 exposure of Naturis sterols in functional food and nutraceutical applications is
7 consistent with the ranges established with other substantially equivalent
8 phytosterol products already approved and being sold in various countries around
9 the world.

10 **14. Toxicological information** The applicant notes that an ADI of 130 mg/kg bw/day
11 can be derived for phytosterols, based on animal studies at the highest doses
12 tested and applying a standard 100-fold safety factor. This equates to a daily
13 intake of 9.1 g/day for a 70 kg adult. The applicant is of the view that with proper
14 labelling it is unlikely that consumption will exceed 3 g/day even if the sterols and
15 sterol esters are present in multiple and competing novel foods on the market.

16 **15.** The Committee notes that no regulatory body has established an ADI for
17 phytosterols. EU authorisations for phytosterol products are accompanied by
18 conditions of use, and labelling requirements, that are intended to minimise the
19 possibility that consumers will regularly exceed an intake of 3 g/day. This limit
20 has been set on the basis of human studies which showed that increasing
21 phytosterol intake is associated with a decline in circulating carotenoid levels, and
22 that the cholesterol-lowering effect is maximal at 3 g of phytosterols /day.

23 **CONCLUSION**

24 **16.** The Committee is content that the applicant's approach to demonstrating the
25 equivalence of their phytosterols, to be used in conjunction with the existing
26 phytosterol ingredient is consistent with the criteria set out in Article 3(4) of the
27 Novel Food Regulation (EC) 258/97.

28 **17.** Therefore phytosterols marketed by Naturis can be considered to be substantially
29 equivalent to the existing phytosterol ingredient marketed by ADM.

30 **18.** Naturis should ensure that the labelling of products containing their phytosterols
31 comply with Commission Regulation (EC) 608/2004 concerning the labelling of
32 foods with added phytosterols.

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