

ADVISORY COMMITTEE FOR NOVEL FOODS AND PROCESSES

TOMATO OLEORESIN CONTAINING LYCOPENE FOR USE IN FOODS FOR SPECIAL MEDICAL PURPOSES (LYCORED)

ISSUE

The Dutch Competent Authority has prepared a positive initial opinion on an application for the authorisation of tomato oleoresin containing lycopene (Lyc-O-Mato®) as a novel food ingredient to be incorporated into foods for special medical purposes (FSMP) under the novel foods regulation (EC) No 258/97. The Committee is asked whether it agrees with the initial opinion and whether it has any further comments or objections to make on this application. The Committee's advice will form the basis for the UK's formal response.

Background

1. On 29 July 2008, the European Commission forwarded the Dutch Competent Authority's (CA) positive initial opinion on an application made by Berry Ottaway & Associates on behalf of LycoRed under Article 4 (1) of Regulation (EC) 258/97, for the authorisation tomato oleoresin (Lyc-O-Mato®) containing 5-15% lycopene (due to natural variation in the lycopene content of the tomato variety used) as a novel food ingredient (NI). According to the timescales set out in the Regulation, the UK and other member States have until 27 September 2008 to provide comments and/or reasoned objections to the opinion.
2. Lycopene is a carotenoid with antioxidant properties. The term "oleoresin" describes a naturally occurring mixture of a resin and an essential oil obtained from certain plants. LycoRed describes tomato oleoresin as "a natural extract of tomato lipids which contains various important phytonutrients and dissolved and dispersed in its natural oil".
3. During 2004-2005 the Committee has considered an application submitted by LycoRed for the **same** product to be incorporated into a range of foods (dairy products, bakery products, meat products, juices, soft drinks, soups, cereal products, snack foods, pasta, fats spread and canned products) and were content for the oleoresin to be authorised as a novel food ingredient in the above foods The UK CA forwarded its positive initial opinion to the Commission on 30 June 2005.
4. The applicant estimated that that the total intake of the NI would vary between 6 to 45 mg/day of lycopene due to supplement use, fortified products and background intake from natural sources. These intake levels are higher than

those proposed by the applicant in the current application – see section 9 for details.

5. As explained at the July meeting (paper ACNFP/89/3), Lycored's original application is being considered, along with applications for synthetic lycopene and lycopene extracted from a fungal source, in the light of the group ADI of 0.5 mg/kg bw that was recently established for lycopene from all sources by EFSA's Panel on Additives and Food Contact Materials.
6. Lycopene extracted from tomatoes is authorised as a food colouring agent (E160d) within the EU and is prepared by a production process identical to that for Lyc-O-Mato® with the exception of an additional concentration step for E160d to achieve an oleoresin containing 60-70% lycopene instead of the 5 - 15% lycopene range present in the NI.
7. The NI is extracted from tomatoes with an elevated lycopene concentration and which originate from a hybrid tomato plant. The lycopene rich tomato (LRT) of the tomato plant *Lycopersicon lycopersicum* is obtained through traditional breeding methods and contains at least double the concentration of lycopene that is found in commercial tomato varieties. The same LRT variety is used to manufacture E160d and to produce tomato paste and other processed tomato food products. Additionally, tomato lycopene has been used in food supplements in the EU (doses up to 20 mg/day) well before 1997.
8. As this ingredient has been assessed previously and its safety has been confirmed recently by EFSA (subject to compliance with the ADI of 0-0.5 mg/kg bw), this application is presented here in an abbreviated format, focussing on the proposed extension of use in medical foods. A confidential version of the application and the Dutch CA's initial opinion (Restricted) are attached as Annex A and B, respectively.

LycorRed's proposal to incorporate tomato oleoresin into FSMP

Purpose of application

9. LycorRed now intends to extend the use of the NI from its current use in supplements to include its use in FSMP. FSMP comprise a wide range of products (including enteral and sip feeds) and are required to be used under medical supervision. The marketing of FSMP is regulated by Commission Directive 1999/21/EC, which defines dietary foods for special medical purposes as:

"a category of foods for particular nutritional uses specially processed or formulated and intended for the dietary management of patients and to be used under medical supervision. They are intended for the exclusive or partial feeding of patients with a

limited, impaired or disturbed capacity to take, digest, absorb, metabolise or excrete ordinary foodstuffs or certain nutrients contained therein or metabolites, or with other medically-determined nutrient requirements, whose dietary management cannot be achieved only by modification of the normal diet, by other foods for particular nutritional uses, or by a combination of the two."

Dietary foods for special medical purposes are classified in the following three categories:

"(a) nutritionally complete foods with a standard nutrient formulation which, used in accordance with the manufacturer's instructions, may constitute the sole source of nourishment for the persons for whom they are intended;

(b) nutritionally complete foods with a nutrient-adapted formulation specific for a disease, disorder or medical condition which, used in accordance with the manufacturer's instructions, may constitute the sole source of nourishment for the persons for whom they are intended;

(c) nutritionally incomplete foods with a standard formulation or a nutrient-adapted formulation specific for a disease, disorder or medical condition which are not suitable to be used as the sole source of nourishment.

The foods referred to in points (a) and (b) may also be used as a partial replacement or as a supplement to the patient's diet.

10. **To note:** The amount of lycopene taken by a patient receiving nutritionally complete foods which are the principle (or only) source of nutrition for the patient would be well controlled and under medical supervision. However, this rationale does not necessarily apply when considering other types of FSMP which are only partial replacements or supplements to the diet as the intake of lycopene fortified foods would not be so well controlled (and there is the potential for additional lycopene intake from other normal foods). Additionally, the level of medical supervision when using partial or even total replacements that are not enteral feeds is not as strict as for enteral feeds. More stringent controls in relation to additives apply to foods for infants and young children.
11. The applicant states that the NI is intended as a source of lycopene in order to raise the lycopene intake of patients whose nutritional needs are met by FSMP closer to that expected in healthy individuals eating a normal diet, thereby providing the health benefits associated with lycopene (such as possible antioxidant activity). The applicant also points to research that suggests an increased demand for lycopene (and other carotenoids) in patients receiving FSMP due to inflammation, injury and illness compared to healthy individuals. The applicant highlights that enteral, sip and tube feeds are designed to have a composition that mimics normal dietary intake, but they are lacking in carotenoids. As a result, plasma lycopene levels are low or undetectable in patients solely receiving enteral feeds (carotenoid levels in patients who rely on other types of FSMP are not mentioned).

12. The addition of lycopene is proposed to be undertaken by using a mix of carotenoids from natural sources in proportions similar to those found in the normal diet of healthy people. This application is for the lycopene-rich oleoresin alone because, unlike the other carotenoids in the proposed mixture, the lycopene-rich oleoresin is a novel ingredient and its use in FSMP is not covered by the earlier application.
13. The applicant has acknowledged that lycopene intake from food varies throughout the EU. The intended addition of lycopene to FSMP is based on data suggesting a daily intake of approx. 0.6-2.3 mg from the current regular diet of the general population. The applicant notes that National dietary recommendations in the Western world encourage increased consumption of fruit and vegetables for all age groups and estimates that this increased consumption could mean an increase in average intake of lycopene towards 5 mg/day.
14. For patients who are partially or fully dependent on medical diets to achieve a lycopene status of the same level as healthy individuals, lycopene intake via FSMP should be at least 0.6 mg per day and at most 5 mg/day (83 mg tomato extract per day at most for 6% Lyc-O-Mato® extract) depending on the dietary food and the patients needs. The applicant concludes that as FSMP are required to be administered under medical supervision (as stipulated in Directive 1999/21/EC), it is unlikely that 5 mg/day will be exceeded. The Dutch CA concluded that it is not clear how the applicant will ensure that lycopene intake will be limited to 5 mg/day as this will depend largely on the final concentration of the tomato extract in the FSMP. The Dutch CA states it is the applicant's responsibility to instruct the manufacturers of FSMP on the correct use of the tomato extract.

Assessment of the NI

15. The Dutch CA is content with product specification and that the NI does not contain any contaminants harmful to public health. However, as the applicant has not provided further details on the target group who are to receive FSMP, the Dutch CA assumes the novel product will also be consumed by infants and toddlers and reinforced to the applicant the need for more stringent maximum contaminant concentrations in raw materials for this population.
16. **To note:** The UK initial opinion of June 2005 stated that, as the NI was to be added to ice cream, cakes and biscuits, the Committee were concerned about possible over-consumption by children and suggested that labels of products containing the NI should indicate they may not be suitable for consumption by infants and children under 3 years of age.

17. The Dutch CA did not report any concerns relating to the production process.
18. The toxicological data on the NI have been extensively reviewed by EFSA along with data on lycopene in other sources. The Dutch CA did not express any new concerns over the safety of lycopene.
19. Regarding nutritional information on the NI, the Dutch CA is in agreement with the applicant's conclusion that a daily intake of the proposed amount of lycopene has no adverse effects on the absorption of other carotenoids such as zexanthine, beta carotene and lutein.
20. The fungus *Alternaria* is the most common fungus to affect tomatoes. At the request of the Dutch CA who expressed concern that *Alternaria*-associated mycotoxins may accumulate in the tomato extract, the applicant provided data to demonstrate that the mycotoxins associated with the most harmful *Alternaria* species were not found in three recent batches. The Dutch CA did not express any concerns relating to other tomato-associated harmful substances (tomatine, calystegine, nicotine).
21. The applicant states that to date there have been no reports of allergic reaction caused by tomato oleoresin and states that as the tomato extract is practically free of proteins, it is unlikely to cause an allergic reaction. However, as oleoresin originates from tomatoes which can cause allergic responses in some individuals, the applicant suggests that the NI is described in FSMP ingredients as "tomato extract containing lycopene". In the 2005 assessment of this product by the Committee, members were satisfied that clear labelling offered adequate protection for consumers sensitive to tomato allergens.

COMMITTEE ACTION REQUIRED

22. The Committee is asked whether it agrees with the positive initial opinion from the Dutch CA that the tomato oleoresin produced by LycoRed should be granted authorisation as a novel food ingredient in Foods for Special Medical Purposes, at a level resulting in daily intakes of up to 5 mg lycopene, and whether it wishes to make any comments on the application.

**Secretariat
August 2008**

Annex attached:

Annex A- (Confidential version) Application for the approval of tomato oleoresin containing lycopene (Lyc-O-Mato®) for use in Foods For Special Medical Purposes. (**Restricted**)

Annex B- Initial Opinion on Lyc-O-Mato® from the Dutch Competent Authority (**Restricted**)

available on request:

Annex C- The UK Competent Authority's 2005 positive initial opinion on this ingredient (can be downloaded from <http://www.acnfp.gov.uk/assess/fullapplics/lycotom>)