



**EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA); Scientific Opinion on the substantiation of health claims related to *Lactobacillus rhamnosus* ATCC 53103 (LGG) and “gastro-intestinal health” (ID 906) and maintenance of tooth mineralisation (ID 3018) pursuant to Article 13(1) of Regulation (EC) No 1924/2006**

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## SCIENTIFIC OPINION

### Scientific Opinion on the substantiation of health claims related to *Lactobacillus rhamnosus* ATCC 53103 (LGG) and “gastro-intestinal health” (ID 906) and maintenance of tooth mineralisation (ID 3018) pursuant to Article 13(1) of Regulation (EC) No 1924/2006<sup>1</sup>

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)<sup>2, 3</sup>

European Food Safety Authority (EFSA), Parma, Italy

#### SUMMARY

Following a request from the European Commission, the Panel on Dietetic Products, Nutrition and Allergies was asked to provide a scientific opinion on a list of health claims pursuant to Article 13 of Regulation (EC) No 1924/2006. This opinion addresses the scientific substantiation of health claims in relation to *Lactobacillus rhamnosus* ATCC 53103 (LGG) and “gastrointestinal health” and maintenance of tooth mineralisation. The scientific substantiation is based on the information provided by the Member States in the consolidated list of Article 13 health claims and references that EFSA has received from Member States or directly from stakeholders.

The food constituent that is the subject of the health claims is *L. rhamnosus* ATCC 53103 (LGG). The Panel considers that *L. rhamnosus* ATCC 53103 (LGG) is sufficiently characterised.

#### “Gastro-intestinal health”

The claimed effect is “gastro-intestinal health”. The target population is assumed to be the general population. The claimed effect is not sufficiently defined, and no further details were provided in the proposed wordings. The Panel notes that the references provided addressed several effects, and that it was not possible to establish the effect which is the target for the claim.

The Panel considers that the claimed effect is general and non specific, and does not refer to any specific health claim as required by Regulation (EC) No 1924/2006.

<sup>1</sup> On request from the European Commission, Question No EFSA-Q-2008-1693, EFSA-Q-2008-3750, adopted on 25 March 2011.

<sup>2</sup> Panel members: Carlo Agostoni, Jean-Louis Bresson, Susan Fairweather-Tait, Albert Flynn, Ines Golly, Hannu Korhonen, Pagona Lagiou, Martinus Løvik, Rosangela Marchelli, Ambroise Martin, Bevan Moseley, Monika Neuhäuser-Berthold, Hildegard Przyrembel, Seppo Salminen, Yolanda Sanz, Sean (J.J.) Strain, Stephan Strobel, Inge Tetens, Daniel Tomé, Hendrik van Loveren and Hans Verhagen. One member of the Panel did not participate in the discussion on the subject referred to above because of potential conflicts of interest identified in accordance with the EFSA policy on declarations of interests. Correspondence: [nda@efsa.europa.eu](mailto:nda@efsa.europa.eu)

<sup>3</sup> Acknowledgement: The Panel wishes to thank for the preparatory work on this scientific opinion: The members of the Working Group on Claims: Carlo Agostoni, Jean-Louis Bresson, Susan Fairweather-Tait, Albert Flynn, Ines Golly, Marina Heinonen, Hannu Korhonen, Martinus Løvik, Ambroise Martin, Hildegard Przyrembel, Seppo Salminen, Yolanda Sanz, Sean (J.J.) Strain, Inge Tetens, Hendrik van Loveren and Hans Verhagen. The members of the Claims Sub-Working Group on Gut/Immune: Jean-Louis Bresson, Maria Carmen Collado, Miguel Gueimonde, Daisy Jonkers, Martinus Løvik, Bevan Moseley, Maria Saarela, Seppo Salminen, Yolanda Sanz, Stephan Strobel, Daniel Tomé and Hendrik van Loveren.

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### **Maintenance of tooth mineralisation**

The claimed effect is “oral health/flora”. The target population is assumed to be the general population. From the information provided, the Panel assumes that the claimed effect refers to the maintenance of tooth mineralisation by reducing mutans streptococci in the oral cavity. The Panel considers that maintenance of tooth mineralisation is a beneficial physiological effect.

In weighing the evidence, the Panel took into account that the only human study provided from which conclusions could be drawn for the scientific substantiation of the claim did not show an effect of *L. rhamnosus* ATCC 53103 (LGG) consumption on reduction of dental caries at any site compared to placebo, the reduction of which could indicate an effect on maintenance of tooth mineralisation.

On the basis of the data presented, the Panel concludes that a cause and effect relationship has not been established between the consumption of *L. rhamnosus* ATCC 53103 (LGG) and maintenance of tooth mineralisation.

### **KEY WORDS**

*Lactobacillus rhamnosus* ATCC 53103 (LGG), gastro-intestinal health, tooth mineralisation, health claims.

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**TERMS OF REFERENCE AS PROVIDED BY THE EUROPEAN COMMISSION**

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**EFSA DISCLAIMER**

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## INFORMATION AS PROVIDED IN THE CONSOLIDATED LIST

The consolidated list of health claims pursuant to Article 13 of Regulation (EC) No 1924/2006<sup>4</sup> submitted by Member States contains main entry claims with corresponding conditions of use and literature for similar health claims. EFSA has screened all health claims contained in the original consolidated list of Article 13 health claims which was received by EFSA in 2008 using six criteria established by the NDA Panel to identify claims for which EFSA considered sufficient information had been provided for evaluation and those for which more information or clarification was needed before evaluation could be carried out<sup>5</sup>. The clarifications which were received by EFSA through the screening process have been included in the consolidated list. This additional information will serve as clarification to the originally provided information. The information provided in the consolidated list for the health claims which are the subject of this opinion is tabulated in Appendix C.

## ASSESSMENT

### 1. Characterisation of the food/constituent

The food constituent that is the subject of the health claims is *Lactobacillus rhamnosus* ATCC53103 (LGG).

The strain *L. rhamnosus* ATCC53103 (LGG) has been identified and characterised at species and strain level using both phenotypic and genotypic methods (Charteris et al., 2001; Janoir et al., unpublished; Tynkkynen et al., 1999). The Panel notes that culture collection numbers from the American Type Culture Collection (ATCC53103) and from the Belgian Co-ordinated Collections of Microorganisms (LMG 18243) are given.

The Panel considers that the food constituent, *L. rhamnosus* ATCC 53103 (LGG), which is the subject of the health claims, is sufficiently characterised.

### 2. Relevance of the claimed effect to human health

#### 2.1. “Gastro-intestinal health” (ID 906)

The claimed effect is “gastro-intestinal health”. The Panel assumes that the target population is the general population.

The claimed effect is not sufficiently defined, and no further details were provided in the proposed wordings. The Panel notes that the references provided addressed several effects (e.g. related to effects on gastro-intestinal symptoms, prevention of antibiotic-associated diarrhoea, treatment of acute diarrhoea, *Helicobacter pylori* eradication, or effects on subjects with a history of traveller’s diarrhoea), and that it was not possible to establish the effect which is the target for the claim.

The Panel considers that the claimed effect is general and non-specific, and does not refer to any specific health claim as required by Regulation (EC) No 1924/2006.

<sup>4</sup> Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006 on nutrition and health claims made on foods. OJ L 404, 30.12.2006, p. 9–25.

<sup>5</sup> EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA), 2011. General guidance for stakeholders on the evaluation of Article 13.1, 13.5 and 14 health claims. EFSA Journal, 9(4):2135, 24 pp.

## 2.2. Maintenance of tooth mineralisation (ID 3018)

The claimed effect is “oral health/flora”. The Panel assumes that the target population is the general population.

From the information provided, the Panel assumes that the claimed effect refers to the maintenance of tooth mineralisation by reducing mutans streptococci in the oral cavity.

Acid is produced in plaque through the fermentation of carbohydrates by acid-producing bacteria, such as *Streptococcus mutans*. Lowering plaque pH contributes to demineralisation of tooth tissues.

The Panel considers that maintenance of tooth mineralisation is a beneficial physiological effect.

## 3. Scientific substantiation of the claimed effect

### 3.1. Maintenance of tooth mineralisation (ID 3018)

Among the references provided in relation to the claim were one human study, which addressed outcomes unrelated to the claimed effect such as the recovery of the strain from saliva after yoghurt consumption, and one *in vitro* study, which was unrelated to the strain that is the subject of the claim (i.e. *Lactobacillus casei* strains). The Panel considers that no conclusions can be drawn from these references for the scientific substantiation of the claim.

A randomised, double-blind, placebo-controlled study was provided (Nase et al., 2001). This study was part of a larger investigation conducted to examine the effects of long-term consumption of “probiotic” milk on children’s health, and especially on the incidence of gastro-intestinal and respiratory infections. The sample size was estimated to show a 20 % reduction in respiratory tract infections. A total of 594 children were randomised to the intervention (test milk: pasteurised cow's milk containing 1 % fat and live *L. rhamnosus* ATCC 53103 (LGG) 5-10x10<sup>5</sup> CFU/mL) or control (milk without lactobacilli) group according to a computer-generated blocked randomisation list. The children drank the milks five days a week for seven months. The day-care personnel, parents, children and investigators were unaware of which milk contained the *L. rhamnosus* ATCC 53103 (LGG) strain, throughout the study. The randomisation code was not broken until the intention-to-treat analyses were performed. Experienced dentists examined the children's oral health according to the WHO criteria. The same examiner carried out the examination of the same children at baseline and then at the end of the study, without reference to the baseline data. The use of fluoride varnish was forbidden during the study, but necessary dental treatment was allowed. In addition, caries was recorded separately for occlusal, smooth (labial and oral) and approximal surfaces. The parameters studied were active caries (initial and decayed, dt/DT), cumulative caries (dmft/DMFT) and caries in occlusal, smooth and approximal surfaces. Pooled plaque and saliva samples were taken in the day-care centres from all children always at the same time, i.e. 1 hour after breakfast, at baseline, in the middle and at the end of the study. In addition, a non-stimulated saliva sample was taken from the 5 to 6-year-old children with the free-flowing method. The pooled plaque and saliva samples were spread with a cotton stick on Dentocult SM Strip mutans® slides, and cultivated according to the manufacturer's instructions. The slides were counted under a stereomicroscope and scored as instructed by the manufacturer. Caries risk was determined on the basis of combined clinical and microbiological results. Caries risk was classified into ‘high’ (a dmft/DMFT or initial caries score >0 and a mutans streptococci count ≥10<sup>5</sup> CFU/mL), ‘moderate’ (either a dmft/DMFT or initial caries score >0 or a mutans streptococci count ≥10<sup>5</sup> CFU/mL), or ‘low’ (no caries detected and a mutans streptococci count <10<sup>5</sup> CFU/mL). Age-stratified analyses were performed. The children were divided into three age groups: 1–2 years, 3–4 years and 5–6 years. All analyses were based on the intention-to-treat population.

The number and proportion of subjects with high ( $\geq 1,000,000$  CFU/mL), medium (100,000– $< 1,000,000$  CFU/mL) or low ( $< 100,000$  CFU/mL) concentrations of *S. mutans* in the intervention and control groups at baseline, middle and end of the study are reported, but no statistical analysis is provided to assess differences between groups. No statistically significant differences were observed between intervention and control groups with respect to dental caries at any site assessed in the study.

Two *in vitro* studies investigating the antibacterial properties of LGG were provided. The Panel considers that evidence provided in *in vitro* studies is not sufficient to predict the occurrence of an effect of *L. rhamnosus* ATCC 53103 (LGG) consumption on the maintenance of tooth mineralisation in humans.

In weighing the evidence, the Panel took into account that the only human intervention study provided from which conclusions could be drawn for the scientific substantiation of the claim did not show an effect of *L. rhamnosus* ATCC 53103 (LGG) consumption on reduction of dental caries at any site compared to placebo, the reduction of which could indicate an effect on maintenance of tooth mineralisation.

The Panel concludes that a cause and effect relationship has not been established between the consumption of *L. rhamnosus* ATCC 53103 (LGG) and maintenance of tooth mineralisation.

## CONCLUSIONS

On the basis of the data presented, the Panel concludes that:

- The food constituent, *Lactobacillus rhamnosus* ATCC 53103 (LGG), which is the subject of the health claims, is sufficiently characterised.

### “Gastro-intestinal health” (ID 906)

- The claimed effect is “gastrointestinal health”. The target population is assumed to be the general population. The claimed effect has not been sufficiently defined.
- The claimed effect is general and non-specific, and does not refer to any specific health claim as required by Regulation (EC) No 1924/2006.

### Maintenance of tooth mineralisation (ID 3018)

- The claimed effect is “oral health/flora”. The target population is assumed to be the general population. From the information provided, it is assumed that the claimed effect refers to the maintenance of tooth mineralisation by reducing mutans streptococci in the oral cavity. Maintenance of tooth mineralisation is a beneficial physiological effect.
- A cause and effect relationship has not been established between the consumption of *L. rhamnosus* ATCC 53103 (LGG) and maintenance of tooth mineralisation.

## DOCUMENTATION PROVIDED TO EFSA

Health claims pursuant to Article 13 of Regulation (EC) No 1924/2006 (No: EFSA-Q-2008-1693, EFSA-Q-2008-3750). The scientific substantiation is based on the information provided by the Member States in the consolidated list of Article 13 health claims and references that EFSA has received from Member States or directly from stakeholders.

The full list of supporting references as provided to EFSA is available on: <http://www.efsa.europa.eu/panels/nda/claims/article13.htm>.

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## APPENDICES

### APPENDIX A

#### BACKGROUND AND TERMS OF REFERENCE AS PROVIDED BY THE EUROPEAN COMMISSION

The Regulation 1924/2006 on nutrition and health claims made on foods<sup>6</sup> (hereinafter "the Regulation") entered into force on 19th January 2007.

Article 13 of the Regulation foresees that the Commission shall adopt a Community list of permitted health claims other than those referring to the reduction of disease risk and to children's development and health. This Community list shall be adopted through the Regulatory Committee procedure and following consultation of the European Food Safety Authority (EFSA).

Health claims are defined as "any claim that states, suggests or implies that a relationship exists between a food category, a food or one of its constituents and health".

In accordance with Article 13 (1) health claims other than those referring to the reduction of disease risk and to children's development and health are health claims describing or referring to:

- a) the role of a nutrient or other substance in growth, development and the functions of the body; or
- b) psychological and behavioural functions; or
- c) without prejudice to Directive 96/8/EC, slimming or weight-control or a reduction in the sense of hunger or an increase in the sense of satiety or to the reduction of the available energy from the diet.

To be included in the Community list of permitted health claims, the claims shall be:

- (i) based on generally accepted scientific evidence; and
- (ii) well understood by the average consumer.

Member States provided the Commission with lists of claims as referred to in Article 13 (1) by 31 January 2008 accompanied by the conditions applying to them and by references to the relevant scientific justification. These lists have been consolidated into the list which forms the basis for the EFSA consultation in accordance with Article 13 (3).

#### ISSUES THAT NEED TO BE CONSIDERED

##### IMPORTANCE AND PERTINENCE OF THE FOOD<sup>7</sup>

Foods are commonly involved in many different functions<sup>8</sup> of the body, and for one single food many health claims may therefore be scientifically true. Therefore, the relative importance of food e.g. nutrients in relation to other nutrients for the expressed beneficial effect should be considered: for functions affected by a large number of dietary factors it should be considered whether a reference to a single food is scientifically pertinent.

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<sup>6</sup> OJ L12, 18/01/2007

<sup>7</sup> The term 'food' when used in this Terms of Reference refers to a food constituent, the food or the food category.

<sup>8</sup> The term 'function' when used in this Terms of Reference refers to health claims in Article 13(1)(a), (b) and (c).

It should also be considered if the information on the characteristics of the food contains aspects pertinent to the beneficial effect.

#### **SUBSTANTIATION OF CLAIMS BY GENERALLY ACCEPTABLE SCIENTIFIC EVIDENCE**

Scientific substantiation is the main aspect to be taken into account to authorise health claims. Claims should be scientifically substantiated by taking into account the totality of the available scientific data, and by weighing the evidence, and shall demonstrate the extent to which:

- (a) the claimed effect of the food is beneficial for human health,
- (b) a cause and effect relationship is established between consumption of the food and the claimed effect in humans (such as: the strength, consistency, specificity, dose-response, and biological plausibility of the relationship),
- (c) the quantity of the food and pattern of consumption required to obtain the claimed effect could reasonably be achieved as part of a balanced diet,
- (d) the specific study group(s) in which the evidence was obtained is representative of the target population for which the claim is intended.

EFSA has mentioned in its scientific and technical guidance for the preparation and presentation of the application for authorisation of health claims consistent criteria for the potential sources of scientific data. Such sources may not be available for all health claims. Nevertheless it will be relevant and important that EFSA comments on the availability and quality of such data in order to allow the regulator to judge and make a risk management decision about the acceptability of health claims included in the submitted list.

The scientific evidence about the role of a food on a nutritional or physiological function is not enough to justify the claim. The beneficial effect of the dietary intake has also to be demonstrated. Moreover, the beneficial effect should be significant i.e. satisfactorily demonstrate to beneficially affect identified functions in the body in a way which is relevant to health. Although an appreciation of the beneficial effect in relation to the nutritional status of the European population may be of interest, the presence or absence of the actual need for a nutrient or other substance with nutritional or physiological effect for that population should not, however, condition such considerations.

Different types of effects can be claimed. Claims referring to the maintenance of a function may be distinct from claims referring to the improvement of a function. EFSA may wish to comment whether such different claims comply with the criteria laid down in the Regulation.

#### **WORDING OF HEALTH CLAIMS**

Scientific substantiation of health claims is the main aspect on which EFSA's opinion is requested. However, the wording of health claims should also be commented by EFSA in its opinion.

There is potentially a plethora of expressions that may be used to convey the relationship between the food and the function. This may be due to commercial practices, consumer perception and linguistic or cultural differences across the EU. Nevertheless, the wording used to make health claims should be truthful, clear, reliable and useful to the consumer in choosing a healthy diet.

In addition to fulfilling the general principles and conditions of the Regulation laid down in Article 3 and 5, Article 13(1)(a) stipulates that health claims shall describe or refer to "the role of a nutrient or other substance in growth, development and the functions of the body". Therefore, the requirement to

describe or refer to the 'role' of a nutrient or substance in growth, development and the functions of the body should be carefully considered.

The specificity of the wording is very important. Health claims such as "Substance X supports the function of the joints" may not sufficiently do so, whereas a claim such as "Substance X helps maintain the flexibility of the joints" would. In the first example of a claim it is unclear which of the various functions of the joints is described or referred to contrary to the latter example which specifies this by using the word "flexibility".

The clarity of the wording is very important. The guiding principle should be that the description or reference to the role of the nutrient or other substance shall be clear and unambiguous and therefore be specified to the extent possible i.e. descriptive words/ terms which can have multiple meanings should be avoided. To this end, wordings like "strengthens your natural defences" or "contain antioxidants" should be considered as well as "may" or "might" as opposed to words like "contributes", "aids" or "helps".

In addition, for functions affected by a large number of dietary factors it should be considered whether wordings such as "indispensable", "necessary", "essential" and "important" reflects the strength of the scientific evidence.

Similar alternative wordings as mentioned above are used for claims relating to different relationships between the various foods and health. It is not the intention of the regulator to adopt a detailed and rigid list of claims where all possible wordings for the different claims are approved. Therefore, it is not required that EFSA comments on each individual wording for each claim unless the wording is strictly pertinent to a specific claim. It would be appreciated though that EFSA may consider and comment generally on such elements relating to wording to ensure the compliance with the criteria laid down in the Regulation.

In doing so the explanation provided for in recital 16 of the Regulation on the notion of the average consumer should be recalled. In addition, such assessment should take into account the particular perspective and/or knowledge in the target group of the claim, if such is indicated or implied.

## **TERMS OF REFERENCE**

### **HEALTH CLAIMS OTHER THAN THOSE REFERRING TO THE REDUCTION OF DISEASE RISK AND TO CHILDREN'S DEVELOPMENT AND HEALTH**

EFSA should in particular consider, and provide advice on the following aspects:

- Whether adequate information is provided on the characteristics of the food pertinent to the beneficial effect.
- Whether the beneficial effect of the food on the function is substantiated by generally accepted scientific evidence by taking into account the totality of the available scientific data, and by weighing the evidence. In this context EFSA is invited to comment on the nature and quality of the totality of the evidence provided according to consistent criteria.
- The specific importance of the food for the claimed effect. For functions affected by a large number of dietary factors whether a reference to a single food is scientifically pertinent.

In addition, EFSA should consider the claimed effect on the function, and provide advice on the extent to which:

- the claimed effect of the food in the identified function is beneficial.
- a cause and effect relationship has been established between consumption of the food and the claimed effect in humans and whether the magnitude of the effect is related to the quantity consumed.
- where appropriate, the effect on the function is significant in relation to the quantity of the food proposed to be consumed and if this quantity could reasonably be consumed as part of a balanced diet.
- the specific study group(s) in which the evidence was obtained is representative of the target population for which the claim is intended.
- the wordings used to express the claimed effect reflect the scientific evidence and complies with the criteria laid down in the Regulation.

When considering these elements EFSA should also provide advice, when appropriate:

- on the appropriate application of Article 10 (2) (c) and (d) in the Regulation, which provides for additional labelling requirements addressed to persons who should avoid using the food; and/or warnings for products that are likely to present a health risk if consumed to excess.

## **APPENDIX B**

### **EFSA DISCLAIMER**

The present opinion does not constitute, and cannot be construed as, an authorisation to the marketing of the food/food constituent, a positive assessment of its safety, nor a decision on whether the food/food constituent is, or is not, classified as foodstuffs. It should be noted that such an assessment is not foreseen in the framework of Regulation (EC) No 1924/2006.

It should also be highlighted that the scope, the proposed wordings of the claims and the conditions of use as proposed in the Consolidated List may be subject to changes, pending the outcome of the authorisation procedure foreseen in Article 13(3) of Regulation (EC) No 1924/2006.

APPENDIX C

Table 1. Main entry health claims related to *Lactobacillus rhamnosus* ATCC 53103 (LGG), including conditions of use from similar claims, as proposed in the Consolidated List.

ID	Food or Food constituent	Health Relationship	Proposed wording
906	<i>Lactobacillus rhamnosus</i> ATCC53103 (LGG®)	Gastro-intestinal health	<ul style="list-style-type: none"> <li>- probiotic</li> <li>-LGG® acts as a part of the natural, beneficial intestinal microbiota;</li> <li>-LGG® supports beneficial microbiota and healthy intestinal metabolism;</li> <li>-LGG® supports a healthy digestive tract and mucosal barrier function;</li> <li>-LGG® balances intestinal activity;</li> <li>-contains probiotics;</li> <li>-is a source of probiotics;</li> <li>-with probiotic/-s;</li> <li>-with (probiotic)/(name of the probiotic).</li> </ul>
			<p><b>Conditions of use</b></p> <ul style="list-style-type: none"> <li>- Food matrix: at least 108 cfu/day. Capsules, tablets etc: at least 109 cfu/day</li> </ul>
ID	Food or Food constituent	Health Relationship	Proposed wording
3018	16. <i>Lactobacillus rhamnosus</i> LGG®	Oral health/flora	<ul style="list-style-type: none"> <li>-helps improve oral health</li> <li>-helps maintain a healthy oral flora</li> <li>-helps maintain oral health</li> <li>-helps improve dental health</li> </ul>
			<p><b>Conditions of use</b></p> <ul style="list-style-type: none"> <li>- 10E8 -10E9 cfu/day</li> </ul>

## **GLOSSARY AND ABBREVIATIONS**

ATCC	American Type Culture Collection
CFU	Colony-forming unit
DMFT	Decayed, missing, filled tooth
DT	Decayed tooth
LMG	Laboratory of Microbiology Gent
WHO	World Health Organization