

SCIENTIFIC OPINION

Scientific Opinion on the substantiation of health claims related to capsaicin and maintenance of body weight after weight loss (ID 2039, 2041, 2042), increase in carbohydrate oxidation (ID 2040), and contribution to normal hair growth (ID 2044) pursuant to Article 13(1) of Regulation (EC) No 1924/2006¹

EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA)^{2, 3}

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 capsaicin and contribution to the maintenance or achievement of a normal body weight, increase in carbohydrate oxidation, and contribution to normal hair growth. 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 capsaicin. The Panel considers that capsaicin is sufficiently characterised.

Maintenance of body weight after weight loss

The claimed effects are “required for enhancing thermogenesis, increasing energy expenditure and enhancing loss of calories”, “required for fat oxidation and burns fat, leading to loss in body weight”, and “required for reducing caloric intake”. The target population is assumed to be overweight individuals in the general population who wish to maintain their body weight after significant weight loss. In the context of the proposed wordings and references provided, the Panel assumes that the claimed effects refer to the maintenance of body weight after weight loss. The Panel considers that maintenance of body weight after weight loss is a beneficial physiological effect.

¹ On request from the European Commission, Question No EFSA-Q-2008-2772, EFSA-Q-2008-2773, EFSA-Q-2008-2774, EFSA-Q-2008-2775, EFSA-Q-2008-2777, adopted on 08 April 2011.

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In weighing the evidence, the Panel took into account that the only human intervention study from which conclusions could be drawn for the scientific substantiation of the claim found no effect of the consumption of capsaicin on body weight maintenance after weight loss.

On the basis of the data presented, the Panel concludes that a cause and effect relationship has not been established between the consumption of capsaicin and maintenance of body weight after weight loss.

Increase in carbohydrate oxidation

The claimed effect is “required for stimulating carbohydrate oxidation and burning carbohydrates”. The target population is assumed to be the general population. The Panel considers that the evidence provided does not establish that an increase in carbohydrate oxidation is *per se* a beneficial physiological effect.

On the basis of the data presented, the Panel concludes that a cause and effect relationship has not been established between the consumption of capsaicin and a beneficial physiological effect related to an increase in carbohydrate oxidation.

Contribution to normal hair growth

The claimed effect is “required for promotion of hair growth”. The target population is assumed to be the general population. The Panel considers that contribution to normal hair growth is a beneficial physiological effect.

No references were provided from which conclusions could be drawn for the scientific substantiation of the claim.

On the basis of the data presented, the Panel concludes that a cause and effect relationship has not been established between the consumption of capsaicin and contribution to normal hair growth.

KEY WORDS

Capsaicin, body weight, carbohydrate oxidation, hair growth, health claims.

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BACKGROUND AS PROVIDED BY THE EUROPEAN COMMISSION

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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 1924/2006⁴ 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 out⁵. 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 capsaicin.

Capsaicin (8-methyl-N-vanillyl-6-nonenamide) is a compound present in large quantities in the fruits, mainly in the pericarp, placenta and seeds of most of the species of plants belonging to the genus *Capsicum*. Capsaicin can be measured by established methods.

The Panel considers that the food constituent, capsaicin, which is the subject of the health claims, is sufficiently characterised.

2. Relevance of the claimed effect to human health

2.1. Maintenance of body weight after weight loss (ID 2039, 2041, 2042)

The claimed effects are “required for enhancing thermogenesis, increasing energy expenditure and enhancing loss of calories”, “required for fat oxidation and burns fat, leading to loss in body weight”, and “required for reducing caloric intake”. The target population is assumed to be overweight individuals in the general population who wish to maintain their body weight after significant weight loss.

In the context of the proposed wordings and references provided, the Panel assumes that the claimed effects refer to the maintenance of body weight after weight loss.

Maintenance of weight loss can be interpreted as the contribution to the maintenance of a normal body weight after significant weight loss. In this context, the maintenance of weight loss in overweight subjects without having achieved a normal body weight is considered to be a beneficial physiological effect.

The Panel considers that maintenance of body weight after weight loss is a beneficial physiological effect.

⁴ 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.

⁵ 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. Increase in carbohydrate oxidation (ID 2040)

The claimed effect is “required for stimulating carbohydrate oxidation and burning carbohydrates”. The Panel assumes that the target population is the general population.

The Panel notes that carbohydrate oxidation is not impaired in the general population and no evidence has been provided that an increase in carbohydrate oxidation is *per se* a beneficial physiological effect.

The Panel concludes that a cause and effect relationship has not been established between the consumption of capsaicin and a beneficial physiological effect related to an increase in carbohydrate oxidation.

2.3. Contribution to normal hair growth (ID 2044)

The claimed effect is “required for promotion of hair growth”. The Panel assumes that the target population is the general population.

The Panel considers that contribution to normal hair growth is a beneficial physiological effect.

3. Scientific substantiation of the claimed effect

3.1. Maintenance of body weight after weight loss (ID 2039, 2041, 2042)

Among the references provided for the scientific substantiation of the claim were two narrative reviews on obesity and macronutrient metabolism which did not provide any original data for the scientific substantiation of the claim. Some human studies and one animal study investigated the effects of food(s)/food constituent(s) other than capsaicin, and/or investigated health outcomes other than body weight changes (e.g. energy metabolism, lipoprotein oxidation, energy intake). The Panel considers that no conclusions can be drawn from these references for the scientific substantiation of the claim.

One reference reported on a randomised, double-blind, placebo-controlled, intervention study which investigated the effect of consuming capsaicin-containing capsules (135 mg/day of capsaicin and 1.2 g/day of vegetable oil) *versus* placebo capsules (1.3 g/day of vegetable oil) for three months on body weight in 120 moderately overweight subjects) (Lejeune et al., 2003). Before the 3-months intervention period (i.e. weight-maintenance period), all subjects received a very-low-energy-diet for four weeks with the aim of losing weight. A total of 23 subjects dropped out during the first four weeks of the study. Thereafter, the weight-maintenance period started and subjects were randomised to receive capsaicin-containing capsules or placebo. Six subjects were removed from the analyses as they continued losing weight or regained more than 100 % weight during the weight-maintenance period. Statistical analyses were performed on 42 subjects in the capsaicin group and 49 in the placebo group. Measurements of body weight were performed at baseline (i.e. before starting the very-low-energy-diet), and at each month up to the end of the weight-maintenance period. No significant differences between the capsaicin and placebo groups were observed at any time with respect to body weight changes. The Panel notes that this study did not show an effect of capsaicin on the maintenance of body weight after weight loss.

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 found no effect of the consumption of capsaicin on body weight maintenance after weight loss.

The Panel concludes that a cause and effect relationship has not been established between the consumption of capsaicin and maintenance of body weight after weight loss.

3.2. Contribution to normal hair growth (ID 2044)

The only reference, which was provided for the scientific substantiation of the claim, reported on an animal and a human intervention study that investigated the efficacy of a combination of food constituents including capsaicin on hair growth in mice and subjects with alopecia. The Panel considers that no conclusions can be drawn for the scientific substantiation of the claim from a study using a fixed combination of capsaicin with other food constituents.

The Panel concludes that a cause and effect relationship has not been established between the consumption of capsaicin and contribution to normal hair growth.

CONCLUSIONS

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

- The food constituent, capsaicin, which is the subject of the health claims, is sufficiently characterised.

Maintenance of body weight after weight loss (ID 2039, 2041, 2042)

- The claimed effects are “required for enhancing thermogenesis, increasing energy expenditure and enhancing loss of calories”, “required for fat oxidation and burns fat, leading to loss in body weight”, and “required for reducing caloric intake”. The target population is assumed to be overweight individuals in the general population who wish to maintain their body weight after significant weight loss. Maintenance of body weight after weight loss is a beneficial physiological effect.
- A cause and effect relationship has not been established between the consumption of capsaicin and maintenance of body weight after weight loss.

Increase in carbohydrate oxidation (ID 2040)

- The claimed effect is “required for stimulating carbohydrate oxidation and burning carbohydrates”. The target population is assumed to be the general population. The evidence provided does not establish that an increase in carbohydrate oxidation is *per se* a beneficial physiological effect.
- A cause and effect relationship has not been established between the consumption of capsaicin and a beneficial physiological effect related to an increase in carbohydrate oxidation.

Contribution to normal hair growth (ID 2044)

- The claimed effect is “required for promotion of hair growth”. The target population is assumed to be the general population. Contribution to normal hair growth is a beneficial physiological effect.
- A cause and effect relationship has not been established between the consumption of capsaicin and contribution to normal hair growth.

DOCUMENTATION PROVIDED TO EFSA

Health claims pursuant to Article 13 of Regulation (EC) No 1924/2006 (No: EFSA-Q-2008-2772, EFSA-Q-2008-2773, EFSA-Q-2008-2774, EFSA-Q-2008-2775, EFSA-Q-2008-2777). 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>.

REFERENCES

Lejeune MP, Kovacs EM and Westerterp-Plantenga MS, 2003. Effect of capsaicin on substrate oxidation and weight maintenance after modest body-weight loss in human subjects. *British Journal of Nutrition*, 90, 651-659.

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 foods⁶ (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 FOOD⁷

Foods are commonly involved in many different functions⁸ 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.

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

⁶ OJ L12, 18/01/2007

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

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

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 capsaicin from capsaicin, including conditions of use from similar claims, as proposed in the Consolidated List.

ID	Food or Food constituent	Health Relationship	Proposed wording
2039	Capsicum Extract –with Capsaicin	Required for enhancing thermogenesis, increasing energy expenditure and enhancing loss of calories.	Enhances thermogenesis Increases energy expenditure Enhances loss of calories
	Conditions of use - In the various human clinical studies the dosage of Capsaicin from Red Pepper administered at 30 mg/day		
ID	Food or Food constituent	Health Relationship	Proposed wording
2040	Capsicum Extract –with Capsaicin	Required for stimulating carbohydrate oxidation and burning carbohydrates	Stimulates carbohydrate oxidation Burns carbohydrates
	Conditions of use - In the various human clinical studies the dosage of Capsaicin from Red Pepper administered at the dose of 30 mg/day		
ID	Food or Food constituent	Health Relationship	Proposed wording
2041	Capsicum Extract –with Capsaicin	Required for fat oxidation and burns fat, leading to loss in body weight	Stimulates fat oxidation Burns fat Helps maintain healthy lipid profile
	Conditions of use - In the various human clinical studies the dosage of Capsaicin from Red Pepper administered at the dose of 30- mg/day		
ID	Food or Food constituent	Health Relationship	Proposed wording
2042	Capsicum Extract –with Capsaicin	Required for reducing caloric intake	Reduces caloric intake
	Conditions of use - In the various human clinical studies the dosage of Capsicum extract administered at the dose of 2.769-6.75 mg/day - In the various human clinical studies the dosage of Capsaicin from Red Pepper administered at the dose of 2.769-6.75 mg/day		
ID	Food or Food constituent	Health Relationship	Proposed wording
2044	Capsicum Extract –with Capsaicin	Required for promotion of hair growth.	Helps promote hair growth.
	Conditions of use - In a human clinical trial capsaicinoids containing capsaicin was administered at a dose level of 6 mg/day along with 75 mg/day of isoflavone.		